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15 **UNITED STATES DISTRICT COURT**
16 **DISTRICT OF NEVADA**

17 ACRES 4.0, INC., a Nevada Corporation, CASE NO.:
18 Plaintiff,
19 v. **COMPLAINT**
20 IGT, a Nevada Corporation,
21 Defendant.

22
23 Plaintiff Acres 4.0, Inc. (“Acres 4.0”) seeks a declaratory judgment that Acres 4.0 does
24 not infringe U.S. Patent Nos. 7,390,263 (the “‘263 Patent”), 9,269,231 (the “‘231 Patent”),
25 10,102,714 (the “‘714 Patent”), or 10,706,677 (the “‘677 patent”) assigned to Defendant IGT. In
26 the alternative, Acres 4.0 seeks a declaratory judgment that the ‘263 Patent, the ‘231 Patent, the
27 ‘714 Patent, and the ‘677 Patent are invalid.

28 ///

PRELIMINARY STATEMENT

1
2 1. This is an action for declaratory judgment arising under the patent laws of the
3 United States, Title 35 of the United States Code. Acres 4.0 seeks a declaratory judgment that
4 Acres 4.0 does not infringe the ‘263 Patent, the ‘231 Patent, the ‘714 Patent, or the ‘677 Patent.
5 Acres 4.0 seeks a declaratory judgment that the ‘263 Patent, the ‘231 Patent, the ‘714 Patent, the
6 ‘677 Patent are invalid.

7 2. On September 13, 2021, Defendant IGT sent a letter to Acres 4.0 alleging that
8 Acres 4.0’s product entitled Foundation™ is infringing the ‘263 Patent, the ‘231 Patent, the ‘714
9 Patent, and the ‘677 Patent. **Exhibit 1.** Acres 4.0’s Foundation™, however, does not infringe the
10 ‘263 Patent (**Exhibit 2**), the ‘231 Patent (**Exhibit 3**), the ‘714 Patent (**Exhibit 4**), or the ‘677
11 Patent (**Exhibit 5**). Further, the ‘263 Patent, the ‘231 Patent, the ‘714 Patent, and the ‘677 Patent
12 are invalid. Accordingly, Acres 4.0 has filed this lawsuit.

THE PARTIES

13
14 3. Acres 4.0, Inc. (“Acres 4.0”) is a Nevada Corporation with an address of 6415
15 South Tenaya Way, Suite 110, Las Vegas, Nevada 89113. Acres 4.0 obtains gaming regulatory
16 approvals and designs and manufactures a variety of computer systems for gaming technology,
17 including products for cashless transactions and player tracking.

18 4. On information and belief, Defendant IGT is a Nevada Corporation with an
19 operating headquarters in Las Vegas, Nevada at 6355 South Buffalo Drive, Las Vegas, Nevada
20 89113. On information and belief, IGT is the assignee of the ‘263 Patent, the ‘231 Patent, the
21 ‘714 Patent, and the ‘677 Patent.

JURISDICTION AND VENUE

22
23 5. Jurisdiction is proper in this Court because this action arises under the Declaratory
24 Judgment Act, 28 U.S.C. § 2201 *et seq.*, and under the patent laws of the United States, Title 35
25 of the United States Code.

26 6. This Court has subject matter jurisdiction over this action under 28 U.S.C. §§
27 1331, 1338(a), and 2201(a).

28 ///

THIRD CLAIM FOR RELIEF

(Declaratory Judgment that Acres 4.0 Does Not Infringe U.S. Patent No. 10,102,714)

26. Acres 4.0 repeats and realleges each and every allegation contained in the paragraphs above as if fully set forth herein.

27. IGT has alleged and continues to allege that Acres 4.0 infringes the ‘714 Patent.

28. Acres 4.0 has not infringed and does not infringe any valid and/or enforceable claim of the ‘714 Patent, directly or indirectly, literally or under the doctrine of equivalents, through the manufacture, use, sale, and/or offer for sale of Acres 4.0’s accused products.

29. All claims of the ‘714 Patent require an element or step to “block data communicated from a card reader of a gaming machine to a component of a player tracking system.”

30. Acres 4.0’s Foundation™ does not satisfy at least the limitation to “block data communicated from a card reader of a gaming machine to a component of a player tracking system” as claimed in each and every claim of the ‘714 Patent at least because Acres 4.0’s Foundation™ does not block any signals from the card reader.

31. As a result of the acts described in the foregoing paragraphs, there exists a substantial controversy of sufficient immediacy and reality to warrant the issuance of a declaratory judgment.

32. A judicial determination is necessary and appropriate so that Acres 4.0 may ascertain its rights regarding the ‘714 Patent.

33. Acres 4.0 is entitled to a judicial declaration that it has not infringed and does not infringe the ‘714 Patent.

FOURTH CLAIM FOR RELIEF

(Declaratory Judgment that Acres 4.0 Does Not Infringe U.S. Patent No. 10,706,677)

34. Acres 4.0 repeats and realleges each and every allegation contained in the paragraphs above as if fully set forth herein.

35. IGT has alleged and continues to allege that Acres 4.0 infringes the ‘677 Patent.

1 36. Acres 4.0 has not infringed and does not infringe any valid and/or enforceable
2 claim of the ‘677 Patent, directly or indirectly, literally or under the doctrine of equivalents,
3 through the manufacture, use, sale, and/or offer for sale of Acres 4.0’s accused products.

4 37. All claims of the ‘677 Patent require an element that will either “generate a logon
5 code” or perform the step of “generating, by a processor, a logon code.”

6 38. Acres 4.0’s Foundation™ does not satisfy at least the limitations of having a
7 processor that will “generate a logon code” or performing the step of “generating, by a processor,
8 a logon code,” one of which limitations is claimed and required by every claim of the ‘677
9 Patent, at least because Acres 4.0’s Foundation™ does not generate a logon code.

10 39. As a result of the acts described in the foregoing paragraphs, there exists a
11 substantial controversy of sufficient immediacy and reality to warrant the issuance of a
12 declaratory judgment.

13 40. A judicial determination is necessary and appropriate so that Acres 4.0 may
14 ascertain its rights regarding the ‘677 Patent.

15 41. Acres 4.0 is entitled to a judicial declaration that it has not infringed and does not
16 infringe the ‘677 Patent.

17 **FIFTH CLAIM FOR RELIEF**

18 **(Declaratory Judgment that U.S. Patent No. 7,390,263 is invalid)**

19 42. Acres 4.0 repeats and realleges each and every allegation contained in the
20 paragraphs above as if fully set forth herein.

21 43. Each and every claim of the ‘263 Patent is invalid for failure to satisfy the
22 provisions of 35 U.S.C. § 101.

23 44. The claims of the ‘263 Patent are directed to an abstract idea and are thus directed
24 to a patent-ineligible concept. The claims’ elements, considered both individually and as an
25 ordered combination, also fail to transform the nature of the claims into a patent-eligible
26 application.

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28 ///

1 45. As a result of the acts described in the foregoing paragraphs, there exists a
2 substantial controversy of sufficient immediacy and reality to warrant the issuance of a
3 declaratory judgment.

4 46. A judicial determination is necessary and appropriate so that Acres 4.0 may
5 ascertain its rights regarding the '263 Patent.

6 47. Acres 4.0 is entitled to a judicial declaration that the '263 Patent is invalid.

7 **SIXTH CLAIM FOR RELIEF**

8 **(Declaratory Judgment that U.S. Patent No. 9,269,231 is invalid)**

9 48. Acres 4.0 repeats and realleges each and every allegation contained in the
10 paragraphs above as if fully set forth herein.

11 49. Each and every claim of the '231 Patent is invalid for failure to satisfy the
12 provisions of 35 U.S.C. § 101.

13 50. The claims of the '231 Patent are directed to an abstract idea and are thus directed
14 to a patent-ineligible concept. The claims' elements, considered both individually and as an
15 ordered combination, also fail to transform the nature of the claims into a patent-eligible
16 application.

17 51. As a result of the acts described in the foregoing paragraphs, there exists a
18 substantial controversy of sufficient immediacy and reality to warrant the issuance of a
19 declaratory judgment.

20 52. A judicial determination is necessary and appropriate so that Acres 4.0 may
21 ascertain its rights regarding the '231 Patent.

22 53. Acres 4.0 is entitled to a judicial declaration that the '231 Patent is invalid.

23 **SEVENTH CLAIM FOR RELIEF**

24 **(Declaratory Judgment that U.S. Patent No. 10,102,714 is invalid)**

25 54. Acres 4.0 repeats and realleges each and every allegation contained in the
26 paragraphs above as if fully set forth herein.

27 55. Each and every claim of the '714 Patent is invalid for failure to satisfy the
28 provisions of 35 U.S.C. § 101.

PRAYER FOR RELIEF

Acres 4.0 respectfully requests the following relief:

66. That the Court enter a judgment declaring that Acres 4.0 has not infringed and does not infringe any valid and enforceable claims of the '263 Patent;

67. That the Court enter a judgment declaring that Acres 4.0 has not infringed and does not infringe any valid and enforceable claims of the '231 Patent;

68. That the Court enter a judgment declaring that Acres 4.0 has not infringed and does not infringe any valid and enforceable claims of the '714 Patent;

69. That the Court enter a judgment declaring that Acres 4.0 has not infringed and does not infringe any valid and enforceable claims of the '677 Patent;

70. That the Court enter a judgment declaring that the '263 Patent is invalid;

71. That the Court enter a judgment declaring that the '231 Patent is invalid;

72. That the Court enter a judgment declaring that the '714 Patent is invalid;

73. That the Court enter a judgment declaring that the '677 Patent is invalid; and

74. That the Court award Acres 4.0 any other relief as the Court may deem just, equitable, and proper.

Dated this 25th day of October 2021.

GARMAN TURNER GORDON LLP

/s/ Jared M. Sechrist

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Attorneys for Plaintiff

EXHIBIT 1

EXHIBIT 1



September 13, 2021

VIA EMAIL (john.acres@acres4.com)

Mr. John F. Acres, CEO
Acres 4.0
6415 S Tenaya Way, Suite 110
Las Vegas, NV 89113

Re: NOTICE OF INFRINGEMENT – IGT CARDLESS/CASHLESS PATENTS

Dear Mr. Acres:

IGT, the global leader in gaming technology, has invested significant research and development resources addressing and solving numerous technological issues associated with cardless login/authentication and cashless funds transfer on casino gaming floors. This work has led to the acquisition and development of a sizable patent portfolio consisting of over 200 worldwide patents covering fundamental technology necessary for implementing a cardless/cashless floor implementation that is reliable, efficient, and secure.

IGT has become aware of various industry publications and product information statements made by representatives of Acres 4.0 regarding the features and capabilities of its new Foundation™ platform, including the recent placements in casinos in Pennsylvania. After comparing this information to our patents, IGT hereby places Acres 4.0 on notice of infringing one or more claims of the following cardless/cashless patents.

1. US Patent No. 7,390,263, entitled *Method of implementing cashless play of gaming devices interconnected by a computer network.*
2. US Patent No. 9,269,231, entitled *Facilitating use of a financial transaction device in a cashless wagering system in a gaming system.*
3. US Patent No. 10,102,714, entitled *Virtual players card.*
4. US Patent No. 10,706,677, entitled *Methods and apparatus for providing secure logon to a gaming machine using a mobile device.*

IGT would prefer to resolve this matter through good faith business discussions and avoid any unnecessary distractions resulting from a failure to do so. We respectfully request that you appoint a senior member of your business organization to lead these discussions with respective members of our organization. Please let us know by October 10, 2021 if Acres 4.0 has any desire to find a business resolution to this matter.

Respectfully,

A handwritten signature in blue ink that reads "Stephen Calogero".

Stephen Calogero
Deputy General Counsel – Gaming Americas & IP

Mr. John F. Acres
September 13, 2021
Page 2

cc:

IGT

Nick Khin, COO

Ryan Reddy, SVP – Global Systems and Payments

Eric Lancaster, Sr. Director – Innovation, IP and Strategy

EXHIBIT 2

EXHIBIT 2



US007390263B1

(12) **United States Patent**
Acres

(10) **Patent No.:** US 7,390,263 B1
(45) **Date of Patent:** Jun. 24, 2008

(54) **METHOD OF IMPLEMENTING CASHLESS PLAY OF GAMING DEVICES INTERCONNECTED BY A COMPUTER NETWORK**

OTHER PUBLICATIONS

Canadian Office Action dated Mar. 22, 2005, from Canadian Application No. 2,359,127.

(75) Inventor: **John F. Acres**, Corvallis, OR (US)

(Continued)

(73) Assignee: **IGT**, Reno, NV (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 963 days.

Primary Examiner—Corbett B. Coburn
(74) *Attorney, Agent, or Firm*—Weaver Austin; Villeneuve & Sampson LLP

(21) Appl. No.: **09/694,065**

(57) **ABSTRACT**

(22) Filed: **Oct. 19, 2000**

(51) **Int. Cl.**
A63F 9/22 (2006.01)

(52) **U.S. Cl.** **463/27**

(58) **Field of Classification Search** 463/25
See application file for complete search history.

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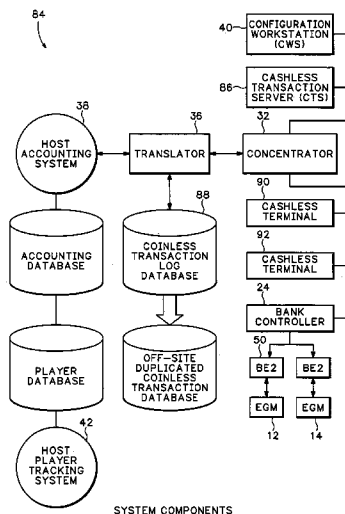
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(Continued)

A method for transferring credits between gaming devices connected by a network to a host computer comprising. A player account accessible by the host computer is created. The player can access the account by inserting a card into a card reader at one of the gaming devices. A casino employee may apply credit to the account responsive to receipt of funds from the player. A predetermined amount of credit is transferred from the account to an EGM responsive to a command entered by the player at the EGM. Alternatively, the player applies a credit to the gaming device, typically by inserting bills into a bill acceptor. The credit and any awards resulting from gaming-device play are stored on a credit meter associated with the gaming device. Access to the account is terminated when the player withdraws the card from the card reader. A player initiates a request to redeem the balance stored on the credit meter by depressing a cash-out button. The balance on the credit meter is transferred to the player account if the cash-out button is pressed before the card is withdrawn, and is paid to the player via the gaming machine if the button is pressed after the card is withdrawn. All transactions are backed up on a database.

32 Claims, 4 Drawing Sheets



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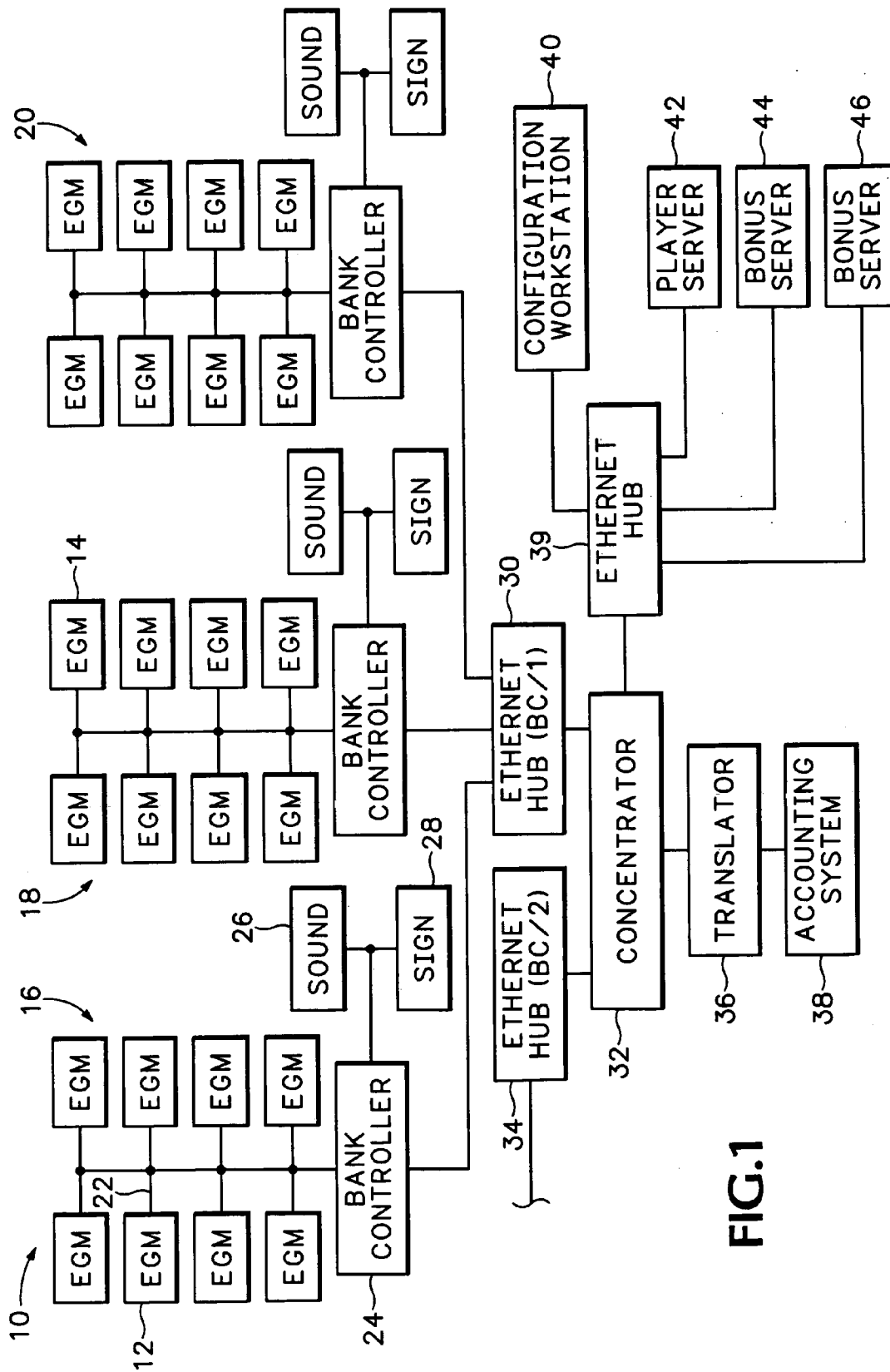


FIG.1

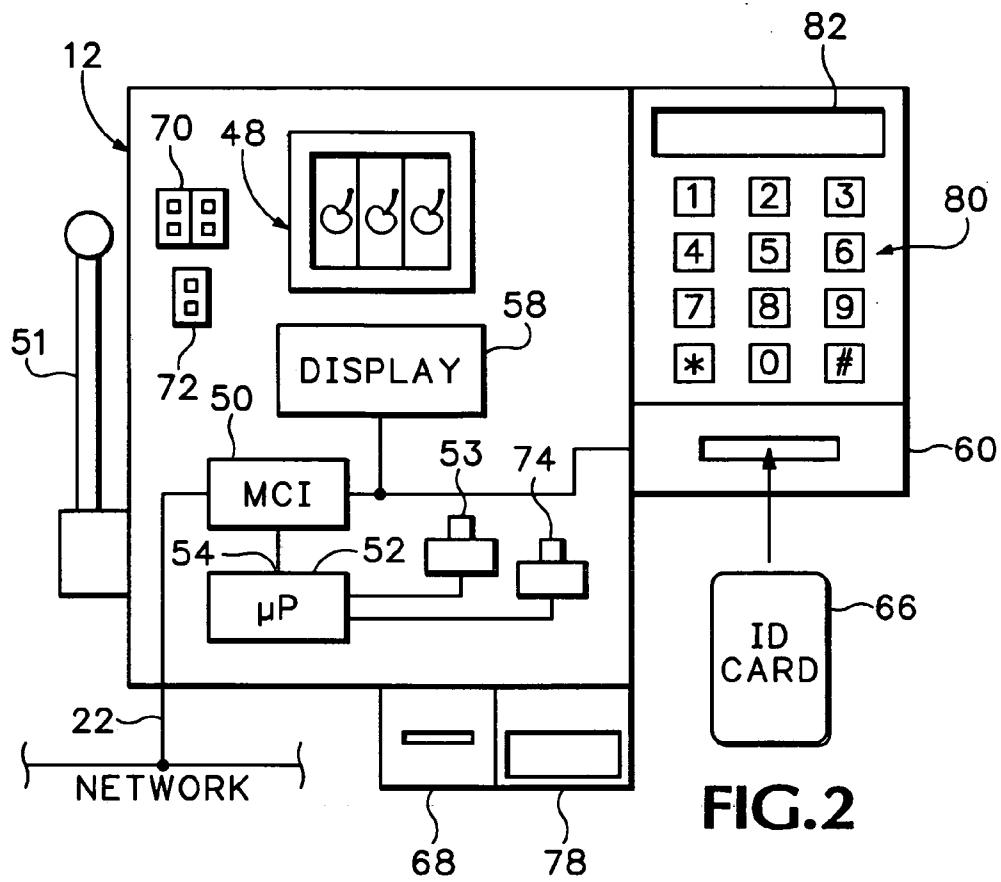


FIG. 2

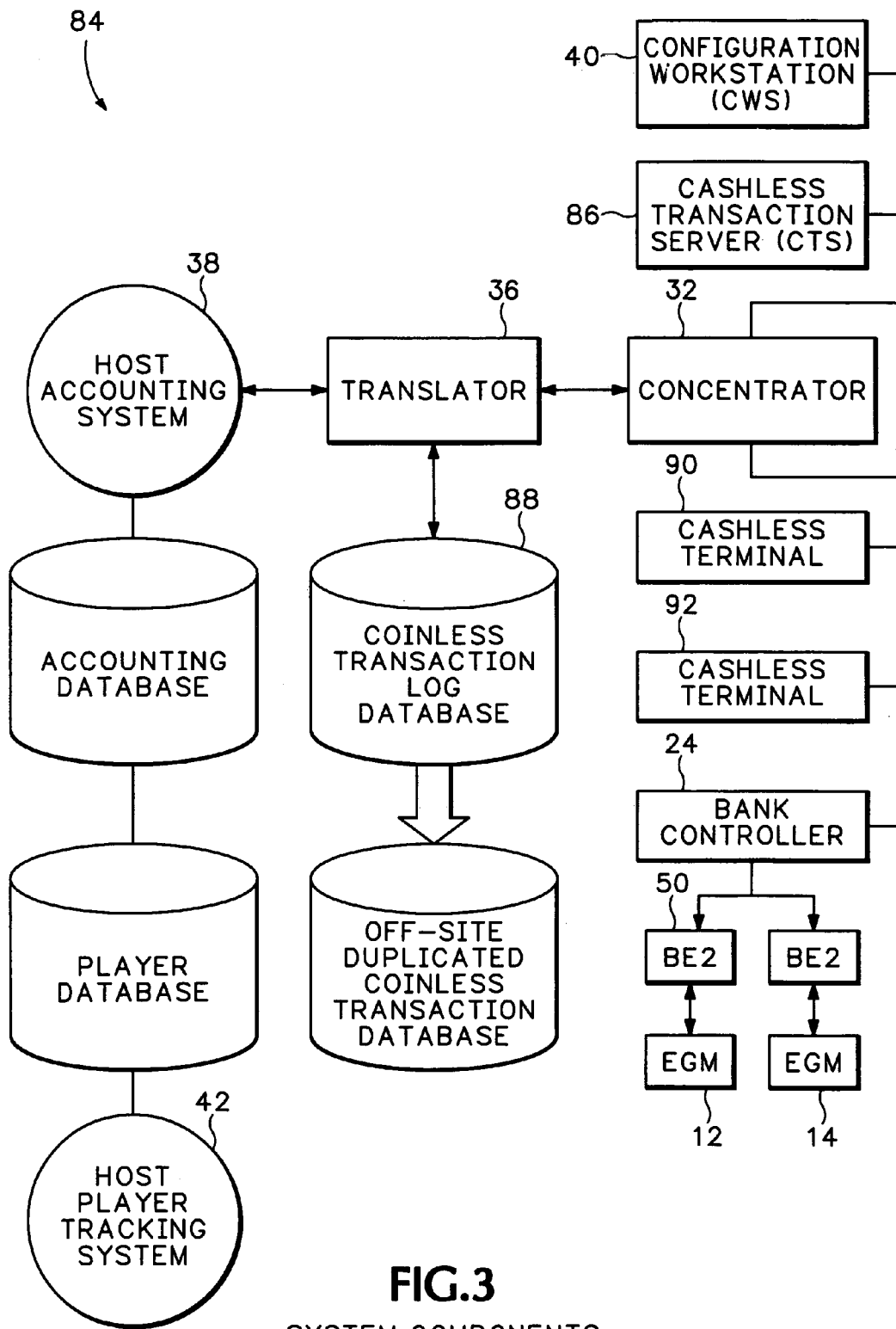
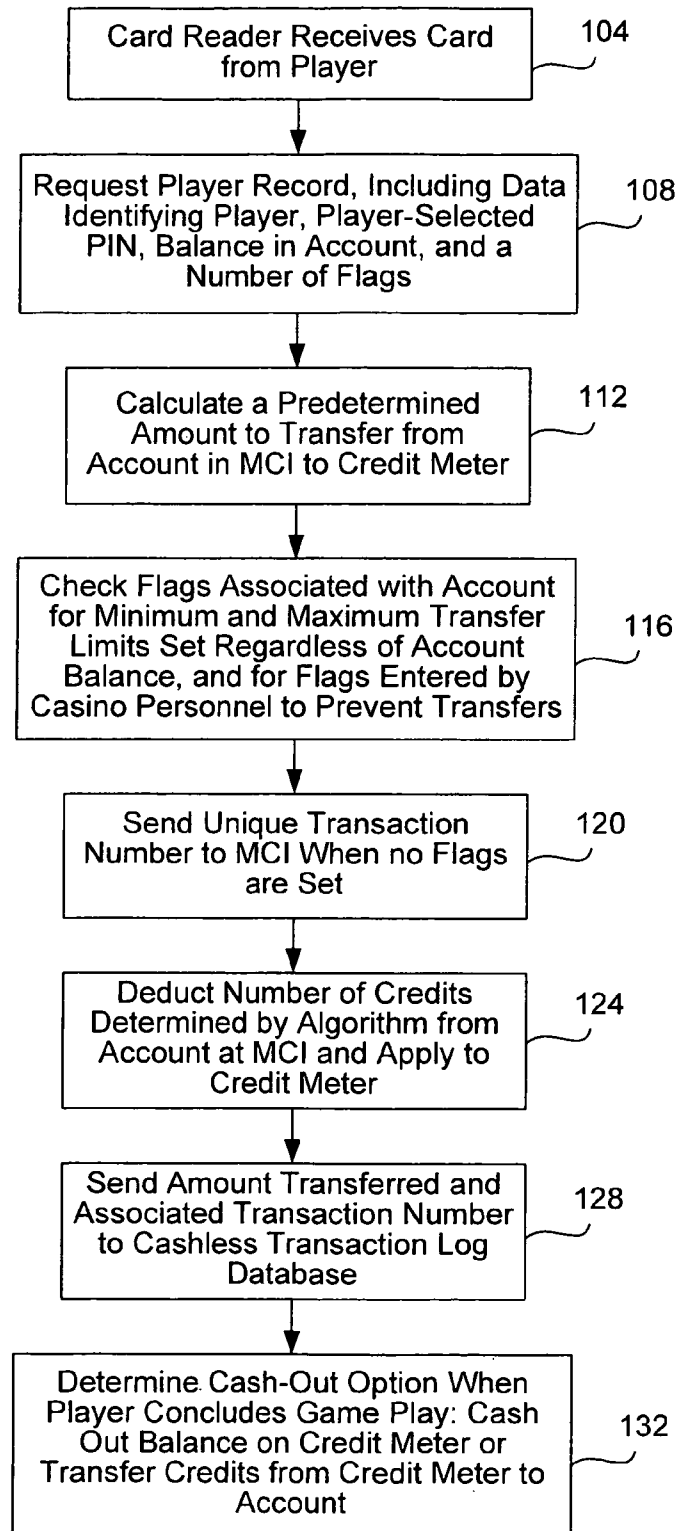


FIG.3

SYSTEM COMPONENTS

**FIG. 4**

US 7,390,263 B1

1

**METHOD OF IMPLEMENTING CASHLESS
PLAY OF GAMING DEVICES
INTERCONNECTED BY A COMPUTER
NETWORK**

BACKGROUND OF THE INVENTION

1. Field of the Invention

This application is a continuation-in-part of U.S. patent application No. 09/134,285, filed Aug. 14, 1998. The present invention relates to a method of accounting for player's wagers, jackpots, and awards on a network of gaming machines, and more particularly to such a method that facilitates cashless play of the gaming devices.

2. Description of the Related Art

There are several prior art systems implementing cashless gaming on electronic gaming devices, such as slot machines, that are connected to a host computer via a network. Such systems typically require a player to open a cashless gaming account with the casino prior to playing. The player must appear before a casino cashier who creates a player record on the host computer, receives an initial deposit from the player, and enters the deposit as a credit in the player account. The cashier also issues a cashless-wagering card to the player, who is now ready to begin cashless gaming.

The player selects a slot machine on the casino floor and inserts his or her card into a card reader associated with the slot machine. Each of the other slot machines also include associated card readers. Most prior art systems incorporate a security feature, such as a personal identification number (PIN), that must be satisfied before the system permits the player to draw on the credit in the account. In these prior art systems, the player enters his or her PIN on a keypad associated with the slot machine and card reader after insertion of the card. When the security feature is satisfied, the amount in the player's account appears on the display associated with the slot machine. The player may then draw on the account by initiating commands at the slot machine that transfer credits from the account to the slot machine. As the player transfers money from the account to the slot machine, the credit in the account decreases. If the player should be the recipient of a jackpot or other award at the slot machine, the conventional credit meter on the slot machine increments to add the jackpot or award to the balance on the credit meter.

When the player concludes playing, the balance is transferred from the credit meter to the player's cashless-wagering account responsive to a command initiated by the player. The player then withdraws his or her card and leaves the balance in the account for placing wagers on one of the slot machines at a future time, which may be a few hours, a few days, or longer.

SUMMARY OF THE INVENTION

Gaming devices are interconnected by a network to a host computer. A player account accessible by a host computer is created. Access to the account is provided responsive to a first command initiated by a player at one of the gaming devices. Credit is then transferred from the account to the gaming device, which the player then plays. After play, the player cashes out from the gaming device using a second command at the gaming device.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic diagram of a plurality of electronic gaming machines interconnected by a computer network to a host computer in accordance with the present invention.

2

FIG. 2 is a schematic diagram of a slot machine and associated hardware implemented in accordance with the present invention.

FIG. 3 is a schematic diagram of another embodiment of the invention.

FIG. 4 is a flow diagram of another embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now to FIG. 1, indicated generally at 10 is a schematic diagram illustrating electronic gaming machines (EGMs), like EGMs 12, 14, interconnected by a computer network. In the present embodiment, the EGM comprises a slot machine. Included in the network are three banks, indicated generally at 16, 18, 20, of EGMs. Each EGM is connected via a network connection, like connection 22, to a bank controller 24. In the present embodiment of the invention, each bank controller comprises a processor that facilitates data communication between the EGMs in its associated bank and the other components on the network. The bank controller also includes a CD ROM drive for transmitting digitized sound effects, such as music and the like, to a speaker 26 responsive to commands issued over the network to bank controller 24. The bank controller is also connected to an electronic sign 28 that displays information, such as jackpot amounts and the like, visible to players of machines on bank 16. Such displays are generated and changed responsive to commands issued over the network to bank controller 24. Each of the other banks 18, 20 of EGMs include associated bank controllers, speakers, and signs as shown, which operate in substantially the same manner.

Ethernet hub 30 connects each of the bank controllers associated with banks 16, 18, 20 of EGMs to a concentrator 32. Another Ethernet hub 34 connects similar bank controllers (not shown), each associated with an additional bank of EGMs (also not shown), to concentrator 32. The concentrator functions as a data control switch to route data from each of the banks to a translator 36. The translator comprises a compatibility buffer between the concentrator and a proprietary accounting system 38. It functions to place all the data gathered from each of the bank controllers into a format compatible with accounting system 38. The present embodiment of the invention, translator 38 comprises an Intel PENTIUM 200 MHz Processor operating Microsoft WINDOWS NT 4.0.

Another Ethernet hub 39 is connected to a configuration workstation 40, a player server 42, and to bonus servers 44, 46. Hub 39 facilitates data flow to or from workstation 40 and servers 42, 44, 46.

The configuration workstation 40 comprises a user interface. It comprises a personal computer including a keyboard, Intel PENTIUM Processor and Ethernet card.

The player server 42 comprises a microcomputer that is used to control messages that appear on displays associated with each EGM. Player server 42 includes an Intel PENTIUM Processor and an Ethernet card.

Bonus servers 44, 46 each comprise a microcomputer used to control bonus applications on the network. Each bonus application comprises a set of rules for awarding jackpots in excess of those established by the pay tables on each EGM. For example, some bonus awards may be made randomly, while others may be made to link to groups of EGMs operating in a progressive jackpot mode. Examples of bonuses that can be implemented on the network are disclosed in co-pending application Ser. No. 08/843,411, filed Apr. 15, 1997 and assigned to the Assignee of the present application (the

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'411 application), which is incorporated herein by reference for all purposes. This co-pending application also describes in more detail features of the network, like that shown in FIG. 1, that may be used to implement the present invention. Also incorporated herein by reference for all purposes is U.S. Pat. No. 5,655,961, assigned to the Assignee of the present application (the '961 patent), which also discloses bonuses that can be implemented by bonus servers 44, 46 and a network that could be used to implement the present invention.

FIG. 2 is a highly schematic representation of an electronic slot machine, which is typical of each of the machines in the network, and which incorporates network communications hardware as described hereinafter. This hardware is described in the '961 patent, and is referred to therein as a data communications node. Preferably the network communications hardware is like that disclosed in the '411 application, namely a machine communication interface (MCI) 50. MCI 50 facilitates communication between the network, via connection 22, and microprocessor 52, which controls the operation of EGM 12. This communication occurs via a serial port 54 on the microprocessor to which MCI 50 is connected.

Included in EGM 12 are three reels, indicated generally at 48. Each reel includes a plurality of different symbols thereon. The reels spin in response to a pull on handle 51 or actuation of a spin button 53 after a wager is made.

MCI 50 may include a random access memory (RAM), which can be used as later described herein. The MCI also facilitates communication between the network and a vacuum florescent display (VFD) 58, and a card reader 60.

Before describing play according to the invention, description will first be made of a, typical play on a slot machine, like EGM 12. A player plays EGM 12 by placing a wager and then pulling handle 51 or depressing spin button 53. The wager may be placed by inserting a bill into a bill acceptor 68. A typical slot machine, like EGM 12, includes a coin acceptor (not shown) that may also be used by the player to make a wager. A credit meter 70 is a numeric display that indicates the total number of credits available for the player to wager. The credits are in the base denomination of the machine. For example, in a nickel slot machine, when a five-dollar bill is inserted into bill acceptor 68, a credit of 100 appears on credit meter 70. To place a wager, the player depresses a coin-in button (not shown), which transfers a credit from the credit meter 70 to a coin-in meter 72. Each time the button is depressed a single credit transfers to the coin-in meter up to a maximum bet that can be placed on a single play of the machine. Alternatively, a maximum bet button (also not shown) is provided to immediately transfer the maximum number of credits that can be wagered on a single play from the credit meter 70 to the coin-in meter 72.

When coin-in meter 72 reflects the number of credits that the player intends to wager, the player depresses spin button 53 thereby initiating a game.

The player may choose to have any jackpot won applied to credit meter 70. When the player wishes to cash out, the player depresses a cash-out button 74, which causes the credits on meter 70 to be paid in coins to the player at a hopper 78, which is part of machine 12. The machine consequently pays to the player, via hopper 78, the number of coins—in the base denomination of the machine—that appear on credit meter 70.

Typical slot machines, like machine 12, are limited in the total amount of coins that can be paid to the player from the hopper. Thus, when jackpots are in excess of the hopper-pay limit, the machine locks up and the jackpot is hand paid by casino personnel to the player. After the jackpot is so paid, the casino personnel resets the machine to permit play to resume.

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Card reader 60 reads a player-tracking card 66 that is issued by the casino to individual players who choose to have such a card. Card reader 60 and player-tracking card 66 are known in the art, as are player-tracking systems, examples being disclosed in the '961 patent and '411 application. Briefly summarizing such a system, a player registers with the casino prior to commencing gaming. The casino issues a unique player-tracking card to the player and opens a corresponding player account that is stored on accounting system 38 (in FIG. 1). The account includes the player's name and mailing address and perhaps other information of interest to the casino in connection with marketing efforts. Prior to playing one of the EGMs in FIG. 1, the player inserts card 66 into reader 60 thus permitting accounting system 38 to track player activity, such as amounts wagered and won and rate of play.

When the casino opens a player account, it may implement a coinless transfer feature in accordance with the present invention. When the account is so flagged by the casino, play may proceed as follows.

The player selects one of the network slot machines—in this case machine 12—and inserts card 66 into reader 60. The player then inserts one or more bills into bill acceptor 68, which purchases a corresponding number of credits in the base denomination of the machine that are applied to and appear on credit meter 70. The player may also, of course, apply credits to the credit meter by depositing coin in the coin acceptor (not shown) that is part of machine 12. When the player inserts card 66 into reader 60, the player record that the casino created on accounting system 38 is fetched from the accounting system and loaded into memory in MCI 50. Insertion of card 66 into card reader 60 is referred to herein as a first command or a log-in command.

After the credits are displayed on meter 70, the player plays slot machine 12 in a conventional manner as described above. That is, the coin-in button (not shown) is depressed by the player to transfer the desired number of credits from credit meter 70 to coin-in meter 72. After so doing, the player presses spin button 53 to spin reels 48. Upon completion of the game, i.e., after the reels stop spinning, any jackpot payable according to a pay table internal to machine 12 is also applied to credit meter 70. Similarly, any bonuses, i.e., any payments to the player that result from awards not generated by the pay table in machine 12, as described in the '961 patent, are also applied to credit meter 70.

When the player concludes play on machine 12, he or she has two options for redeeming any balance remaining on credit meter 70. First, if cash-out button 74 is depressed while card 66 is received in card reader 60, the credits on meter 70 are transferred to the player account record contained in the RAM in MCI 50. Credit meter 60 then reads 0 credits, and the number of credits displayed on meter 70 when cash-out button 74 is depressed is associated with the player record in the RAM of MCI 50. As soon as this transfer occurs, display 58 indicates the amount transferred to the player. After the transfer to the RAM in MCI 50, the player record and associated credits is transferred via connection 22 over the network to the host computer. The term host computer as used herein may refer to a processor, a controller, or memory, which may be located anywhere, including multiple locations, on the network. In the present case, the host computer includes a dedicated storage area on player server 42. The information stored includes the amount, dollar amount, time that storage occurred and the machine number from which the credit was stored, all of which is associated with the identifying player record. Other data associated with the player record, such as the amounts wagered and won, is stored on accounting system 38 in accordance with prior art player tracking systems.

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Typically the player leaves the card in the card reader from beginning to end of play. This allows the player to be credited for points that can be redeemed for awards. It should be noted, however, that to effect the coinless transfer feature, the card need only be inserted when cash-out button **74** is depressed. In other words, the card need not necessarily be in the card reader during play—the record can be fetched and the credits stored in the player account after all play is complete.

Alternatively, when the player concludes gaming on machine **12**, he or she may choose to receive payment via hopper **78** at the machine. If so, the player withdraws card **66** from reader **60** before pressing cash-out button **74**. Withdrawal of card **66** from card reader **60** is referred to herein as a second command or a log-out command. Because credits remain on credit meter **70**, the player record in RAM of MCI **50** indicates 0 credits, which is stored to the host computer as described above with the player record. The player now depresses cash-out button **74** thus causing the machine to pay credits from meter **70** to hopper **78** in the usual fashion. Depressing cash-out button **74** is referred to herein as a request to redeem the balance stored on the credit meter.

Each slot machine includes conventional controls for setting a maximum amount payable from the hopper of the machine based upon the hoppers capacity and the casino's wishes. In addition, a maximum amount payable at hopper **78** may also be set by the casino at configuration workstation **40** to prevent a player from cashing out credits over a predetermined maximum value. If either value—the value set at the machine or the value set at the workstation—is exceeded, machine **12** locks up in the same fashion as if it had won a jackpot that exceeded the maximum amount payable from the machine hopper.

When a player elects to cash out by storing his or her balance with their player record on the host computer as described above, the player may use the card to transfer the credit to another slot machine on the network. To do so, the player moves to another machine, perhaps after taking a short break, and inserts his or her card **66** into the card reader, like card reader **60**, associated with the new slot machine. The MCI, like MCI **50**, at the new machine detects insertion of the card. The appropriate player record is called from the host computer, including the record stored on bonus server **44** having the amount of credits stored in the player's account. That record and the associated credits are stored initially in the RAM of MCI **50**. The number of credits associated with the record is then transferred to the credit meter of the new machine without any further action on the part of the player. Play then continues as described above, including cashing out by either restoring the balance on the credit meter with his or her account on the host computer or withdrawing the card and cashing out to obtain payment via the machine hopper.

In another embodiment of the present invention, the coinless transfer feature may be implemented without requiring a player to deal with casino personnel. In this embodiment, the player account is anonymous, and is created by the player. In this embodiment, the casino provides an automated card dispenser, each card being coded with an anonymous player account that exists on the host computer. The player simply takes one of the cards from the dispenser and uses it to play as described above. The player has the same options to cash out, namely depressing cash-out button **74** with the card withdrawn to receive coin at the machine and depressing the cash-out button with the card inserted to apply the machine credits to his or her anonymous account in the same manner as described above for an account associated with an identified player. In the latter instance, when the player wishes to

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resume play, they merely insert the card into the card reader associated with the selected slot machine and credits are applied to the credit meter of the slot machine as described above. The player can also cash out by presenting the card to the cashier, also as described above. The anonymous coinless transfer system is advantageous in that casino personnel are not required to activate the coinless transfer feature.

In another aspect, the present invention limits the time between storing credits to a player's account, whether anonymous or not, and accessing the account to resume play with credits in the account. In this aspect, the host computer initiates a timed count when the player withdraws his or her card from the card reader. The casino may select—at configuration workstation **40**—a maximum time, for example, 2 hours, that the player may access the account using a card reader. If this time is exceeded, the credits will not transfer from the account to the credit meter of the slot machine when the card is inserted. The player must therefore present the card to a casino cashier who can access the account using a card reader and reimburse the player with the total amount credited to his or her account. This feature reduces potential casino liability by not permitting card access to deposited credits for extended periods.

Consideration will now be given to yet another embodiment of the invention. Turning again FIG. **2**, this embodiment includes a keypad **80** and a vacuum fluorescent display **82**, which in the present embodiment are associated with card reader **60**. The keypad and display communicate with MCI **50** as described in the '961 patent.

Turning now to FIG. **3**, indicated generally at **84** is a schematic diagram of a system including EGMs interconnected by a computer network, which implements this embodiment of the invention. Numbers corresponding to structure identified in the previously-described embodiments identify corresponding structure in system **84**. It should be appreciated that variations in the manner in which the components are interconnected by the network can be readily made by a person having ordinary skill in the art to which the invention relates.

Also included in system **84** is a cashless transaction server (CTS) **86**, which comprises a computer similar to those implementing player server **42** and bonus servers **44**, **46** in the embodiment of FIG. **1**.

Also included in system **84** is a cashless transaction log database **88**. As will be soon described, CTS **86** maintains a record of each cashless play account, including the player associated with that account and the current balance in the account. In the present embodiment of the invention, database **88** is a commercially available database that stores records delivered over the network relating to each cashless play transaction at each of the EGMs on the network in a matter that will be more fully explained hereafter. An off-site database **94** duplicates the information in database **88** as it is entered.

Finally, cashless terminals **90**, **92**, each preferably comprise a card reader, like card reader **60** in FIG. **2**, a computer connected to the network as shown in system **84**, printer connected to the computer, and a keypad, similar to keypad **80**. In addition, a communications board, similar to MCI **50**, is located at each terminal to place the terminal in communication with the network. Typically terminals **90**, **92** are located remote from one another in a casino and are operated by a casino employee to establish accounts and to deposit and withdraw money from the accounts, as will be more fully explained in the following description of the operation of this embodiment.

When the casino opens a player account it may implement a cashless play feature in accordance with the present inven-

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tion. The cashless play feature and the player account may be implemented at one of terminals **90, 92**. When the cashless play feature is implemented, it may be implemented in accordance with the first embodiment, i.e., to permit transfers from one machine to another. Alternatively, the cashless feature can be implemented to permit a player to deposit funds at an EGM in accordance with the first embodiment but require the player to withdraw funds only at one of terminals **90, 92** by presenting his or her card to an agent of the casino, typically an employee, operating the terminal. The casino employee, in turn, accesses the network to determine the account balance and pays it to the customer in a manner that will be more fully described hereinafter. Finally, the cashless account may be implemented in a manner that requires the casino employee to receive initial funds and credit them to the account at one of terminals **90, 92**. But the account may be cashed out at one of the EGMs on the floor in a manner that will be described more fully hereinafter.

The account is opened by receiving information about the player, defining the type of account, and entering this information into CTS **86** via one of terminals **90, 92**. In addition, the player is asked to select a personal identification number (PIN), known only to the player. This number is typically entered by the player at a keypad located at the terminal. The PIN is associated with the player's account on CTS **86** and is used for security purposes as will be soon described.

In any event, after the account is initially funded, whether by the player at the EGM as described in connection with the first embodiment or via crediting the account with funds presented to a casino employee at one of terminals **90, 92**, the player approaches one of the gaming machines, e.g., EGM **12**, to begin play.

Turning now to FIG. 4, indicated generally at **100** is a flow diagram of a method, which implements this embodiment of the invention.

The player first inserts card **66** into card reader **60**, in step **104**. This initiates a first network communication, in step **108**, which is a query from MCI **50** (in response to the card insertion) to CTS **86** requesting the player record. The record includes data identifying the player, the player-selected PIN, the balance in the account, and a number of flags, which can set features that will be described shortly.

CTS **86** responds to this query first by using a Secure Hash Algorithm (SHA) to hash the player's PIN at CTS **86**. The CTS then sends the player record, including the hashed PIN, to MCI **50**, which stores it in the MCI RAM. Once CTS **86** sends the record, it locks the record stored at the CTS thereby creating a session lock for the duration of the session, which is the period between when card **66** is inserted into and withdrawn from card reader **60**. When the session lock is activated, the record can be retrieved from CTS **86**, but the record includes an indication that it is locked thereby preventing any account transaction using the locked record.

After the player record is stored at MCI **50**, the player uses keypad **80** to select cashless play. An algorithm that is part of the software stored in read only memory (ROM) (not shown) in MCI **50** then calculates an amount to transfer from the account in MCI **50** to credit meter **70** on EGM **12**, in step **112**. The amount transferred in step **112** is a predetermined amount calculated by the algorithm; it is not selected by the player using keypad **80**. In step **116**, the algorithm checks flags associated with the account for minimum and maximum transfer limits that are imposed at one of terminals **90, 92** when the account is opened. These minimums and maximums are set regardless of the account balance. The algorithm, of course, also examines the account balance and does not permit a transfer in excess of the account balance. The

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ability to set maximum limits regardless of account balance is a tool that can be used to address problem gamblers, among other things.

In an alternative embodiment, the player may select an amount via keypad **80**, either by keying in the amount using numeric keys on the keypad, or by selecting from one of a plurality of keys each of which is associated with a predetermined transfer amount, e.g., \$50, \$100, \$150, etc.

After insertion of card **66** into reader **60**, resulting in storing the player's record in MCI **50** as described above, the player indicates whether the transfer is to be from the credit meter **70** on EGM **12** to the account in MCI **50** or vice versa. Of course, at the beginning of the session there is typically no money on credit meter **70** of EGM **12**. The player consequently selects a transfer from his or her account to credit meter **70**. After selecting whether the transfer is to or from the EGM as described above, the player is then prompted by display **82** to enter his or her PIN.

After entry of the PIN, MCI **50** uses the same SHA, which is also stored in ROM on MCI **50**, that hash the PIN at CTS **86** to hash the PIN entered by the player at EGM **12**. MCI **50** then compares the hashed PIN transmitted with the player record from CTS **86** with the hashed PIN entered at EGM **12** to confirm that they match before the transaction can continue.

If the hashed PINs match, MCI **50** makes a validation request over the network to CTS **86** before making the transfer—either from credit meter **70** to the account or visa versa—selected by the player. Assuming there is a sufficient balance, i.e., the minimum is met and no flags are set that otherwise prevent the transfer, in step **120**, CTS **86** responds by sending a unique transaction number to MCI **50**. It should be noted in step **116** that one of the flags can be entered by casino personnel from one of terminals **90, 92** to prevent any transfers. A flag might be so set when, e.g., a player reports a lost card.

Once the unique transmission number is received by MCI **50**, MCI **50** retrieves the balance on credit meter **70** and transmits it to CTS **86**. This transmission and each network transmission that follows are associated with the unique transaction number. After MCI **50** receives a response from CTS **86** indicating successful transfer of the initial state of meter **70**, in step **124**, the number of credits determined by the algorithm are deducted from the account at MCI **50** and applied to credit meter **70**. Next, the balance on credit meter **70** is again transmitted to CTS **86** and a response returned to MCI **50** to confirm that communication.

In step **128**, MCI **50** then associates the amount transferred from the account to credit meter **70** with the transaction number and then communicates it to cashless transaction log database **88**. CTS **86**, which has both the initial and final states of credit meter **70**, calculates the amount of the transaction by subtracting the meter states, associates that value with the transaction number, and sends it to cashless transaction log database **88**. The computer operating database **88** receives the meter difference transmitted by CTS **86** and the amount transferred from the account transmitted by MCI **50** and stores both values associated with the transaction number.

Transfers between CTS **86** and one of terminals **90, 92** are effected in substantially the same manner, i.e., the communications board, like MCI **50**, at the terminal receives the player record from CTS **86**, the player enters his or her PIN, and so forth.

If a transaction is not posted by CTS **86**, one of the EGMs, or one of terminals **90, 92**, cashless account variances are easily detected using the data stored on database **88**. In addition, in the event of a system failure, such as a malfunction or destruction of CTS **86**, player account balances can be recon-

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structed using the information stored in database **88**. Even if a catastrophic event prevents recovery of information from any of system **84** located at the casino, the off-site duplicated database **94**, can be used to reconstruct player account balances.

Any transfer to or from the player's cashless accounts generates the above communications. When the player concludes playing, in step **132**, several options may be available depending on how the cashless play feature was implemented for that particular player. First, assuming the player has the capability of cashing out at EGM **12**, he or she can simply use cash-out button **74** to cash out the balance on credit meter **70** at EGM **12** in the usual fashion. If, however, that feature is not implemented, the player can initiate a transfer from the credit meter to the account as described above. In an alternative embodiment, any credits remaining on credit meter **70** are automatically returned to the account at the MCI **50** when the card is withdrawn. The system may also be configured to lock up in response to a large jackpot or a machine malfunction, either of which may require withdrawal of the player's card and insertion of a card issued to a casino employee to effect the transfer. Once the transfer is effective, the account record is returned to CTS **86** from MCI **50**, and the session lock is released. Regardless of how the cashless account is set up, the player may always approach of one of terminals **90**, **92**, present his or her card, and receive and withdraw money from the account.

What is claimed is:

1. A method for transferring credits at a gaming device in communication with a host computer over a network, the host computer having an account associated with a player, the account having a balance, the method comprising:

receiving player identification information at the gaming device, the player identification information identifying the player;

retrieving a determined amount of the account balance from the host computer over the network, the amount of the account balance determined in accordance with one or more flags associated with the account;

storing the retrieved balance on a credit meter associated with the gaming device;

storing any award resulting from play of the gaming device on the credit meter, including updating the balance on the credit meter; and

providing information indicating the balance on the credit meter to the host computer over the network.

2. The method of claim **1**, further comprising:

receiving, at the gaming machine, a request to redeem the balance on the credit meter.

3. The method of claim **1**, wherein the player identification information is received at an interface of the gaming device.

4. The method of claim **1**, wherein retrieving the determined amount of the account balance from the host computer of the network includes:

sending a query to the host computer, the query requesting player data associated with the identified player.

5. The method of claim **1**, wherein the flags indicate one or more selected from the group consisting of: a minimum transfer limit, a maximum transfer limit, and a transfer prevention.

6. The method of claim **5**, wherein the minimum and maximum transfer limits are set regardless of the account balance.

7. The method of claim **5**, wherein the transfer prevention is associated with a report of a lost player card.

8. The method of claim **5**, wherein the transfer prevention is associated with an instruction from a casino operator.

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9. The method of claim **1**, wherein retrieving the determined amount of the account balance from the host computer of the network includes:

deducting the determined amount from the account balance.

10. The method of claim **1**, wherein the determined amount of the account balance is retrieved from the host computer responsive to receiving the player identification information.

11. The method of claim **1**, wherein the determined amount of the account balance is retrieved from the host computer responsive to a player input.

12. The method of claim **1**, wherein the information indicating the balance on the credit meter is provided to the host computer responsive to a player input.

13. The method of claim **1**, further comprising:

sending transaction information identifying the transfer to a transaction log database having initial and final states of the credit meter.

14. The method of claim **1**, further comprising:

determining a cash-out option for the player, including outputting a credit balance on the credit meter from an output device at the one gaming device.

15. The method of claim **14**, wherein the cash-out option is determined responsive to a player selection.

16. The method of claim **1**, wherein the player is anonymous.

17. A gaming device in communication with a host computer over a network for transferring credits between the gaming device and the host computer, the host computer having an account associated with a player, the account having a balance, the gaming device comprising:

a player interface coupled to receive player identification information, the player identification information identifying the player; and

a processor configured to:

retrieve a determined amount of the account balance from the host computer over the network, the amount of the account balance determined in accordance with one or more flags associated with the account,

store the retrieved balance on a credit meter,

store any award resulting from play of the gaming device on the credit meter, including updating the balance on the credit meter; and

provide information indicating the balance on the credit meter to the host computer over the network.

18. The gaming device of claim **17**, wherein the player interface includes a card reader.

19. The gaming device of claim **17**, the processor further configured to:

receive a request to redeem the balance on the credit meter.

20. The gaming device of claim **17**, wherein retrieving the determined amount of the account balance from the host computer of the network includes:

sending a query to the host computer, the query requesting player data associated with the identified player.

21. The gaming device of claim **17**, wherein the flags indicate one or more selected from the group consisting of: a minimum transfer limit, a maximum transfer limit, and a transfer prevention.

22. The gaming device of claim **17**, the processor configured to retrieve the determined amount of the account balance from the host computer responsive to receiving the player identification information.

23. The gaming device of claim **17**, the processor configured to retrieve the determined amount of the account balance from the host computer responsive to a player input.

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24. The gaming device of claim 17, the processor configured to provide the information indicating the balance on the credit meter to the host computer responsive to a player input.

25. The gaming device of claim 17, the processor further configured to:

send transaction information identifying the transfer to a transaction log database having initial and final states of the credit meter.

26. The gaming device of claim 17, the processor further configured to:

determine a cash-out option for the player, including outputting a credit balance on the credit meter from an output device at the one gaming device.

27. A host computer in communication with a gaming device over a network for transferring credits between the host computer and the gaming device, the host computer having an account associated with a player, the account having a balance, the host computer comprising:

an interface coupled to receive player identification information identifying the player;

a processor configured to:

access the player account associated with the player;

provide an amount of the account balance for the gaming device over the network, the amount of the account

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balance determined in accordance with one or more flags associated with the account;

the interface further coupled to receive information indicating an updated balance from the gaming device over the network.

28. The host computer of claim 27, wherein the flags indicate one or more selected from the group consisting of: a minimum transfer limit, a maximum transfer limit, and a transfer prevention.

29. The host computer of claim 28, wherein the minimum and maximum transfer limits are set regardless of the account balance.

30. The host computer of claim 28, wherein the transfer prevention is associated with a report of a lost player card.

31. The host computer of claim 28, wherein the transfer prevention is associated with an instruction from a casino operator.

32. The host computer of claim 28, the processor further configured to:

send transaction information identifying the transfer to a transaction log database having initial and final states of the credit meter.

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EXHIBIT 3

EXHIBIT 3



US009269231B2

(12) **United States Patent**
Curtin et al.

(10) **Patent No.:** US 9,269,231 B2
 (45) **Date of Patent:** Feb. 23, 2016

(54) **FACILITATING USE OF A FINANCIAL TRANSACTION DEVICE IN A CASHLESS WAGERING SYSTEM IN A GAMING SYSTEM**

(58) **Field of Classification Search**
 USPC 463/25, 29
 See application file for complete search history.

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(57) **ABSTRACT**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 187 days.

Use of a financial transaction device of a cashless wagering system is facilitated in a gaming system. The financial transaction device, having at least an account identifier linking the financial transaction card to at least one financial account of at least one financial institution associated with the gaming network, is provided by an electronic gaming machine (EGM), a financial institution, and/or a gaming network, for depositing the financial amount into at least one financial account, performing a cashless wagering operation in the EGM, and/or using the financial transaction device for payment of goods and services by gaming and non-gaming venues. The financial transaction device is used for depositing the financial amount into at least one financial account of the at least one financial institution associated with the gaming network by one of the EGM and the ATM, cashless wagering in the EGM, and/or purchasing the goods and services.

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(22) Filed: **Sep. 6, 2013**

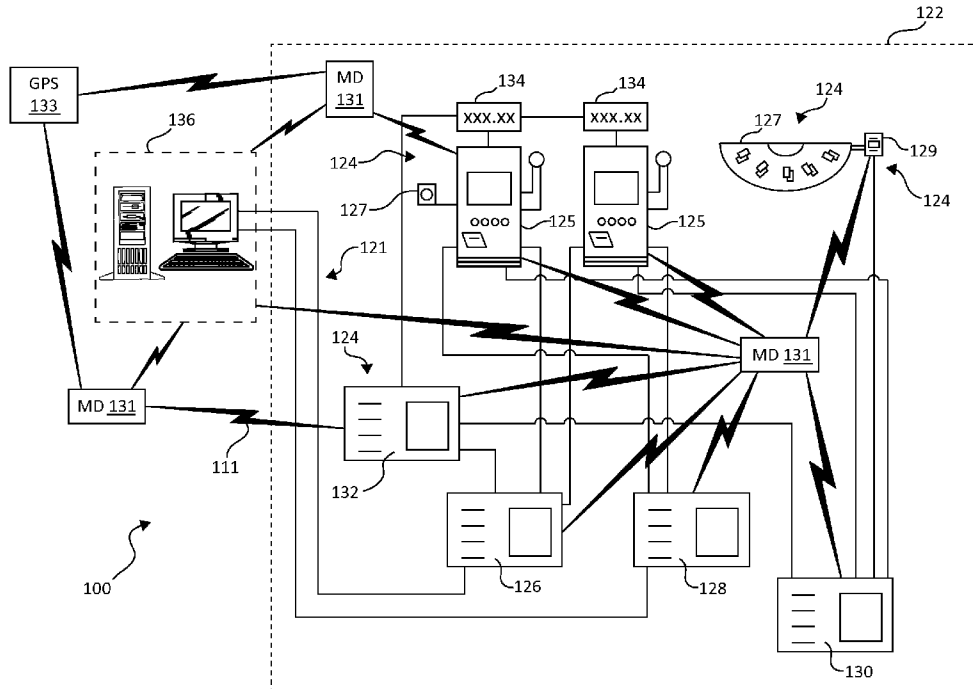
(65) **Prior Publication Data**

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(51) **Int. Cl.**
A63F 13/12 (2006.01)
G07F 17/32 (2006.01)

(52) **U.S. Cl.**
 CPC **G07F 17/3251** (2013.01); **G07F 17/3225** (2013.01)

39 Claims, 14 Drawing Sheets



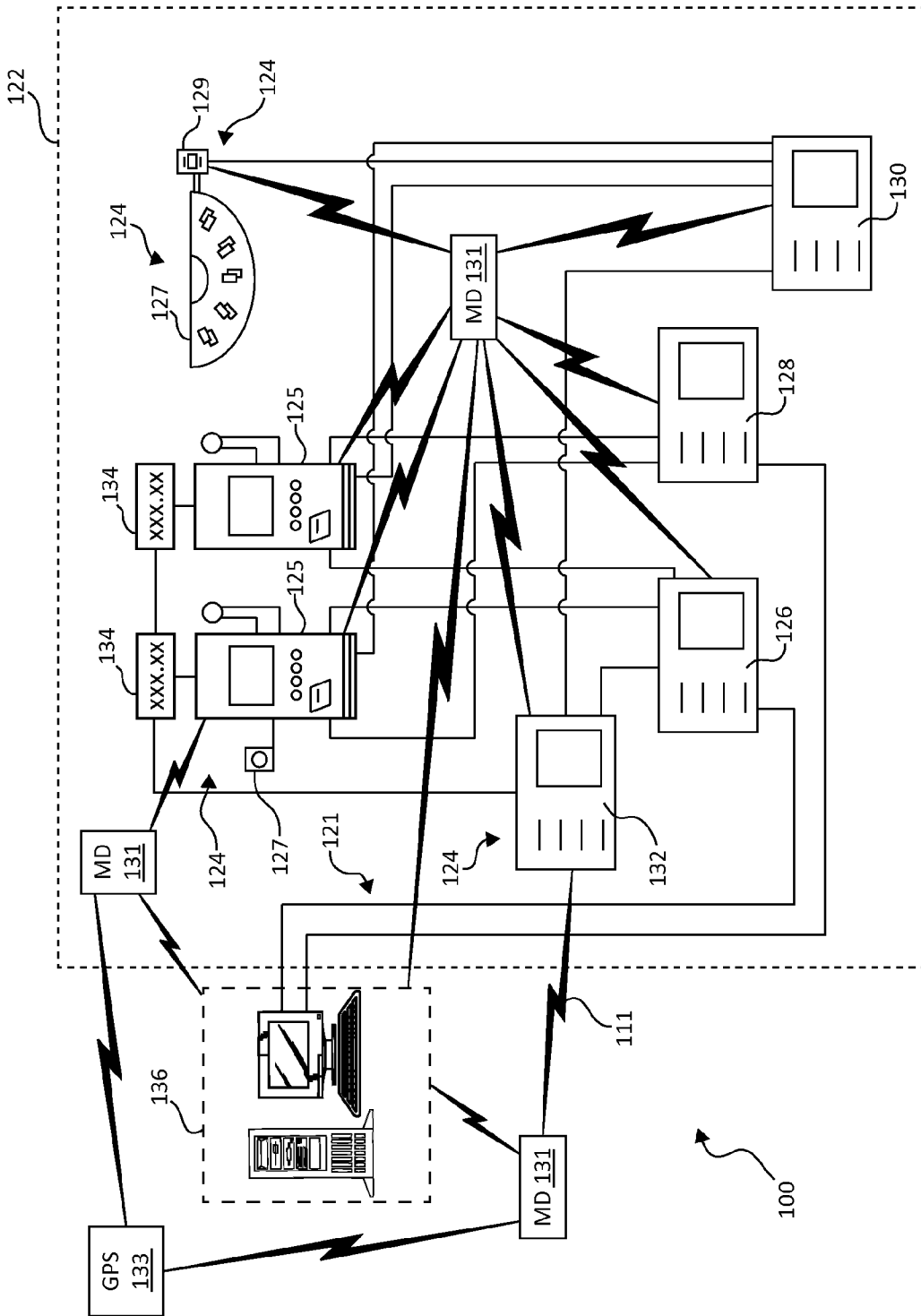


FIG. 1

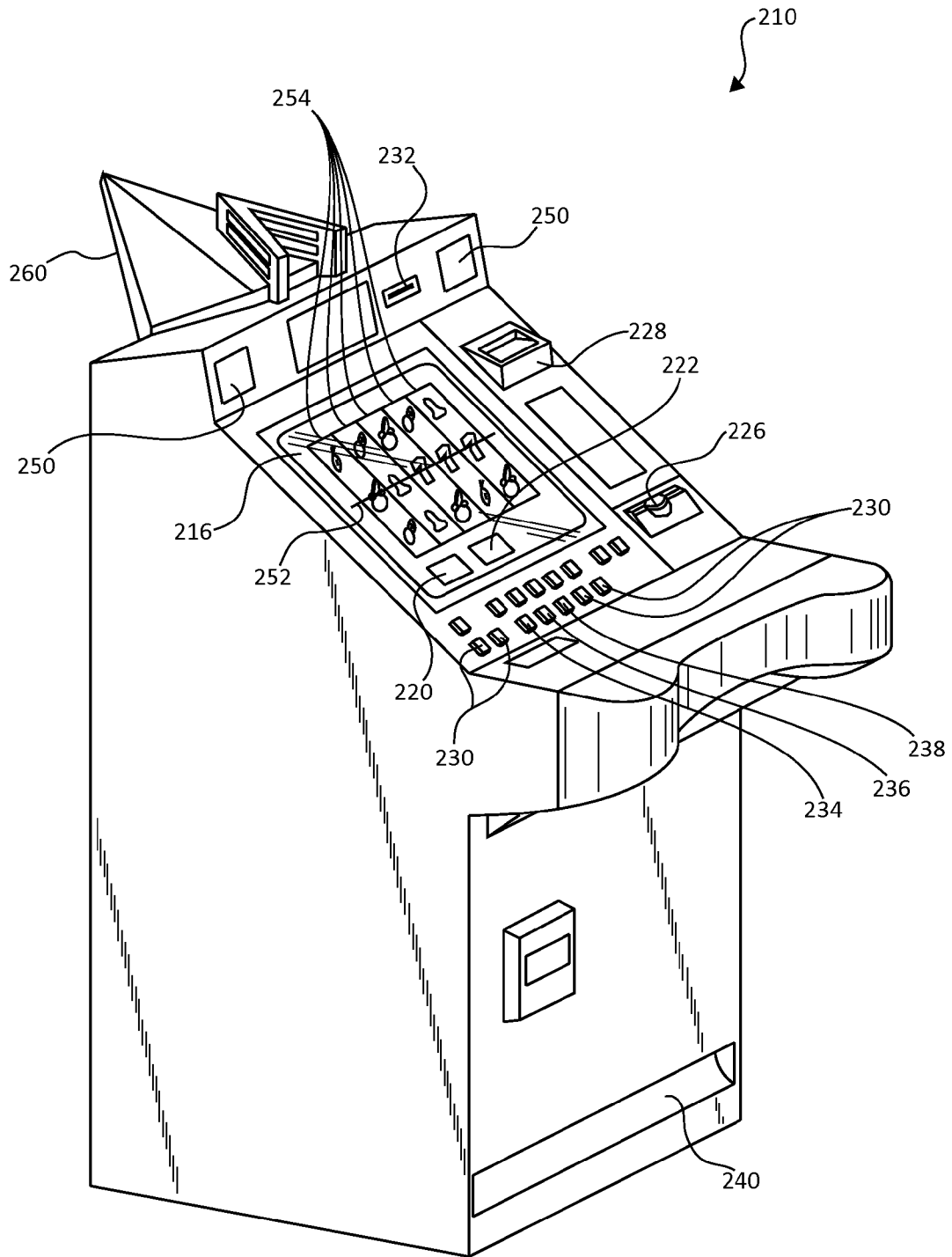


FIG. 2

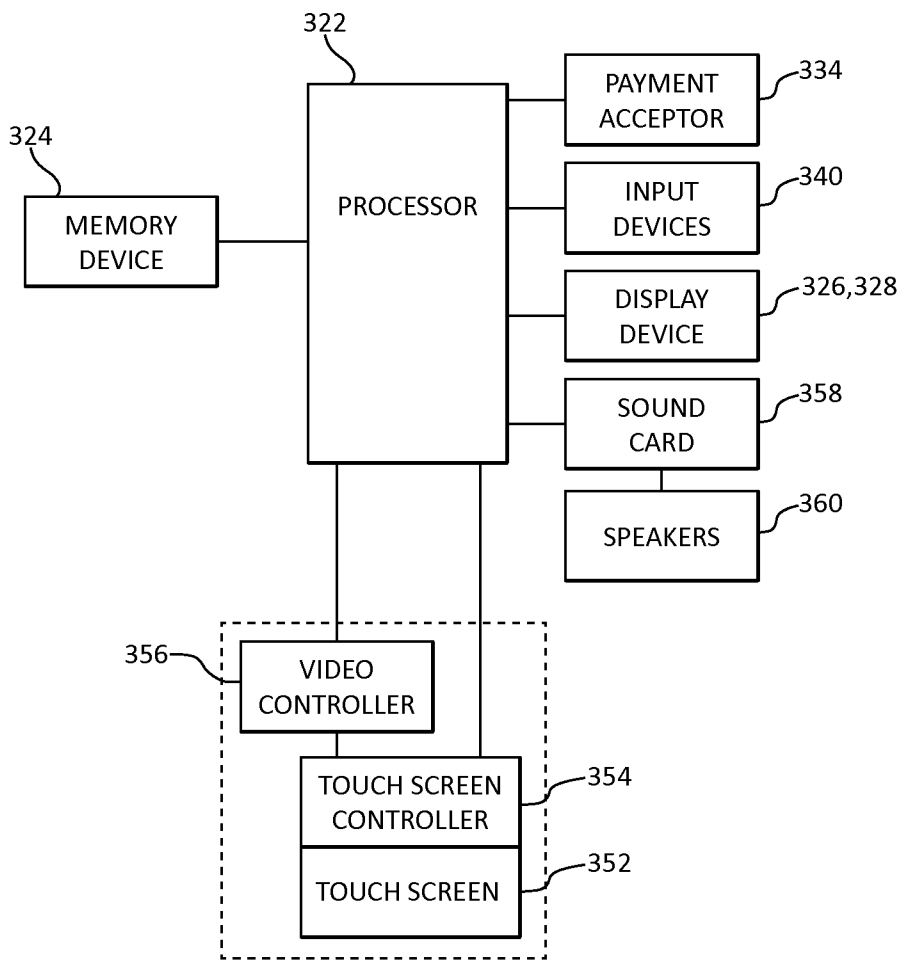


FIG. 3A

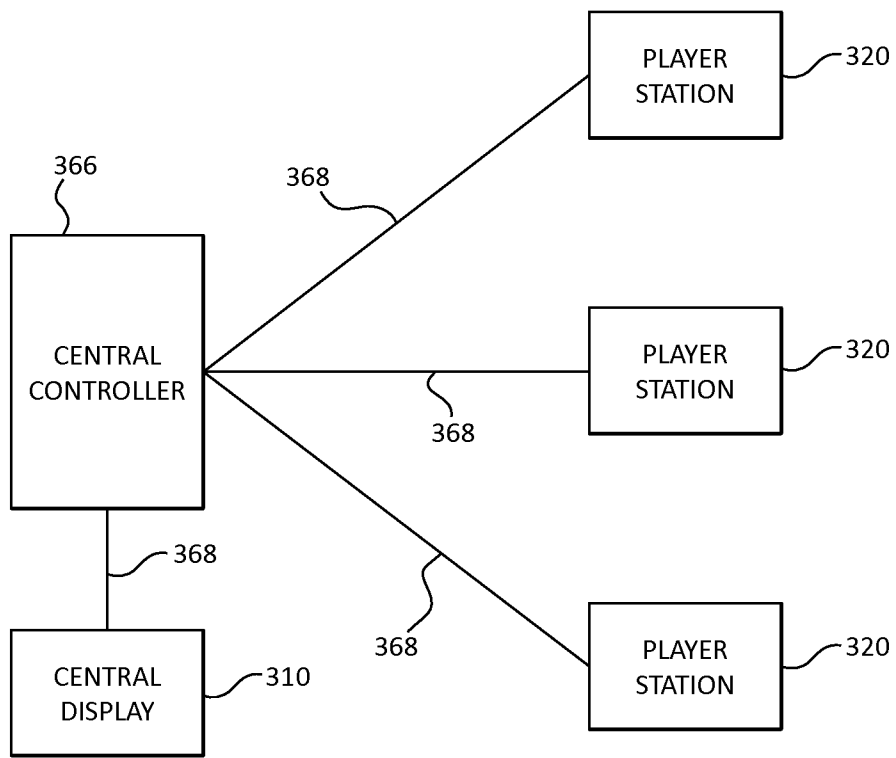


FIG. 3B

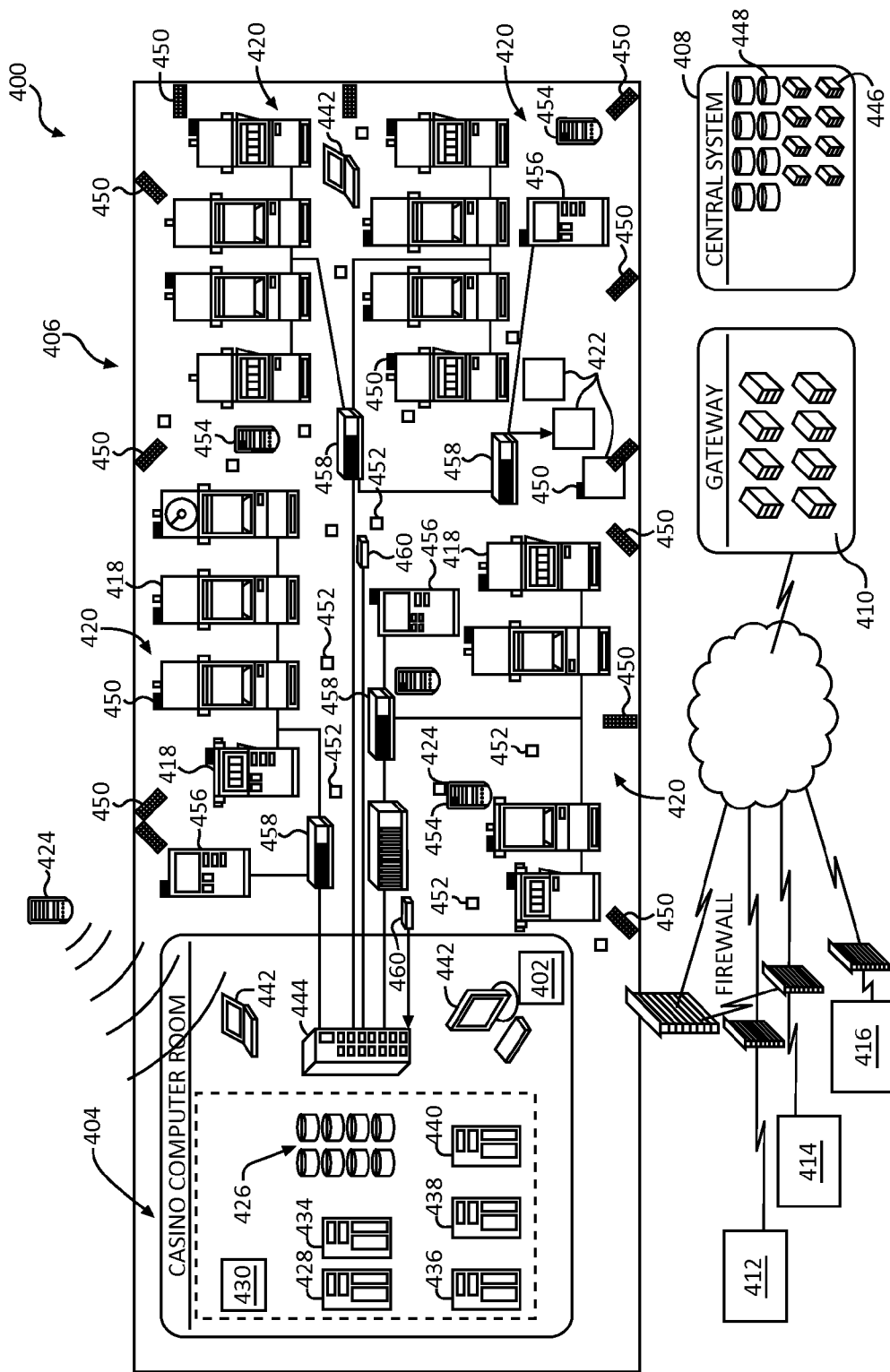


FIG. 4

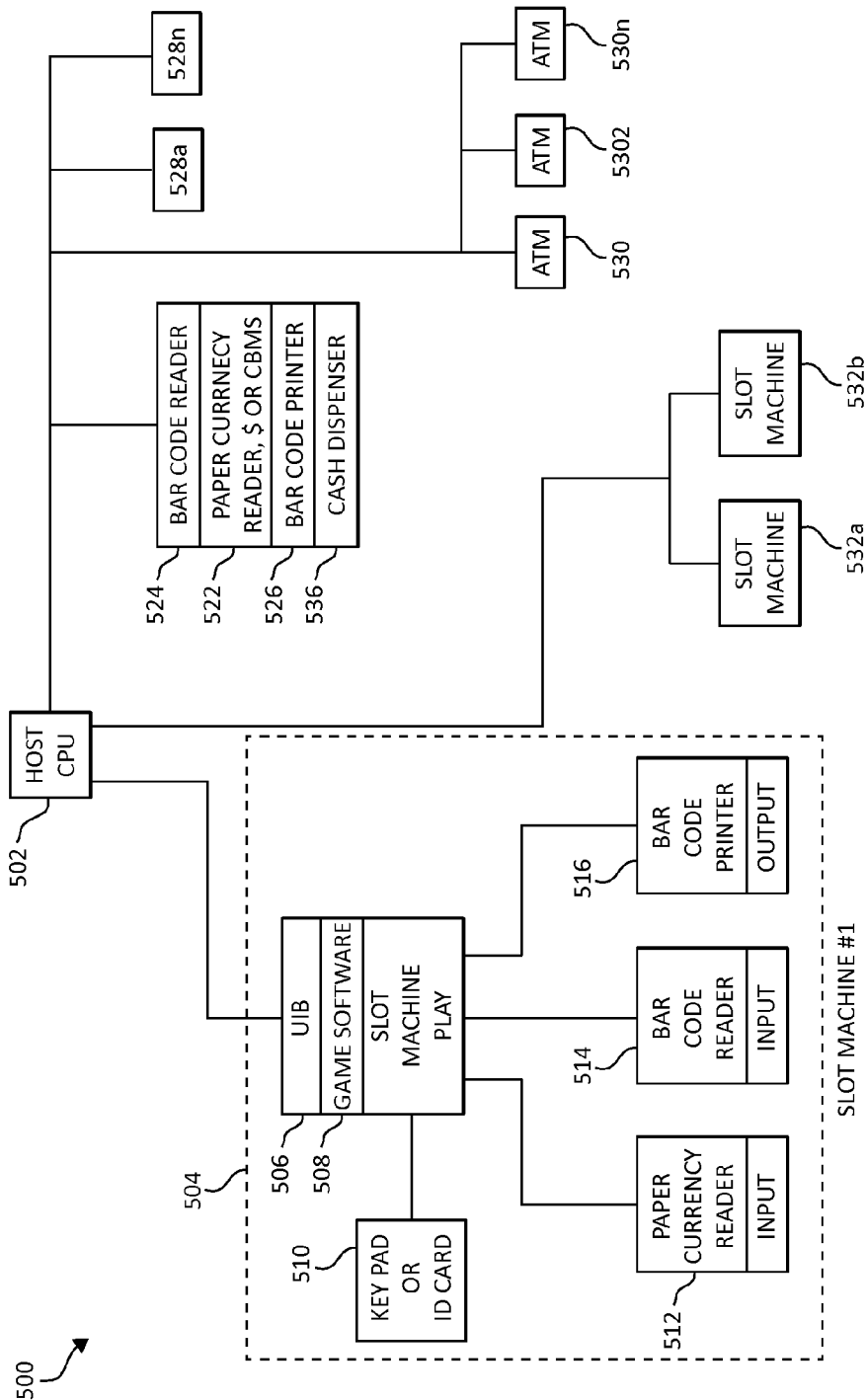


FIG. 5

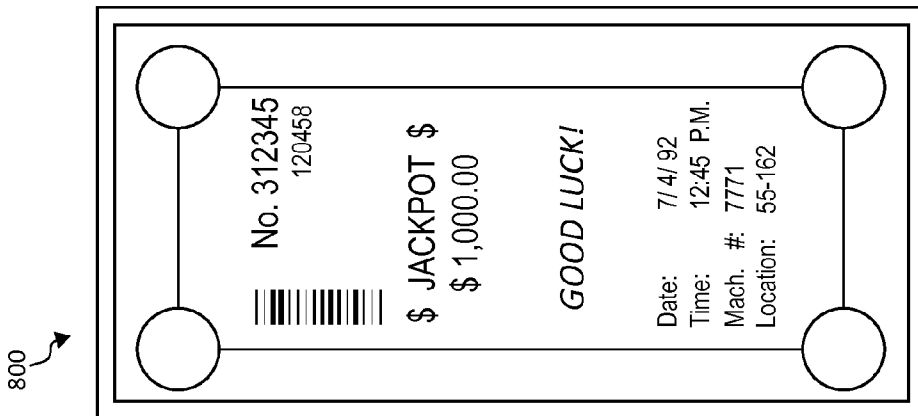


FIG. 6

630 LOGO

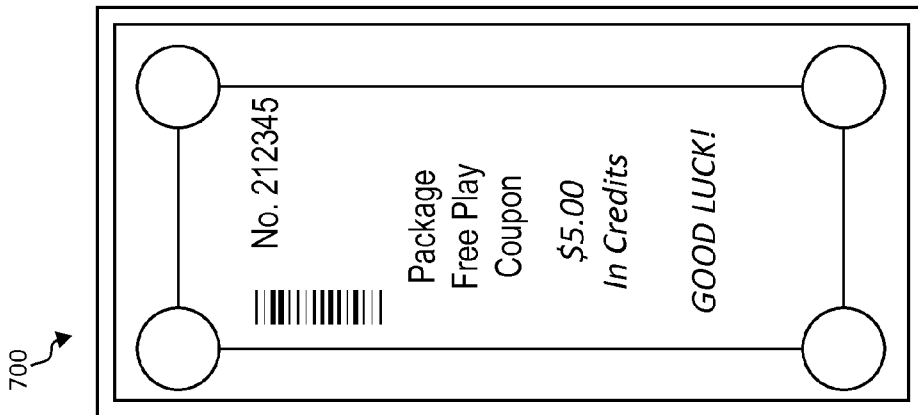


FIG. 7

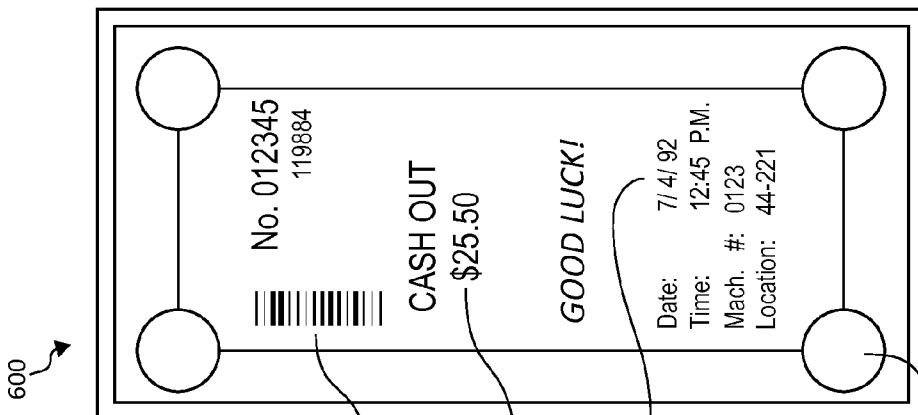
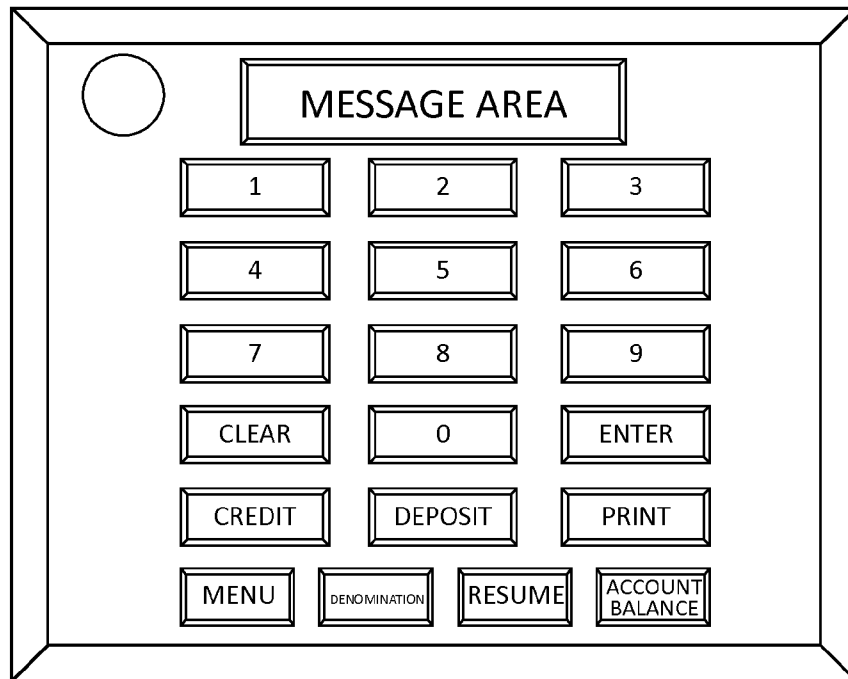
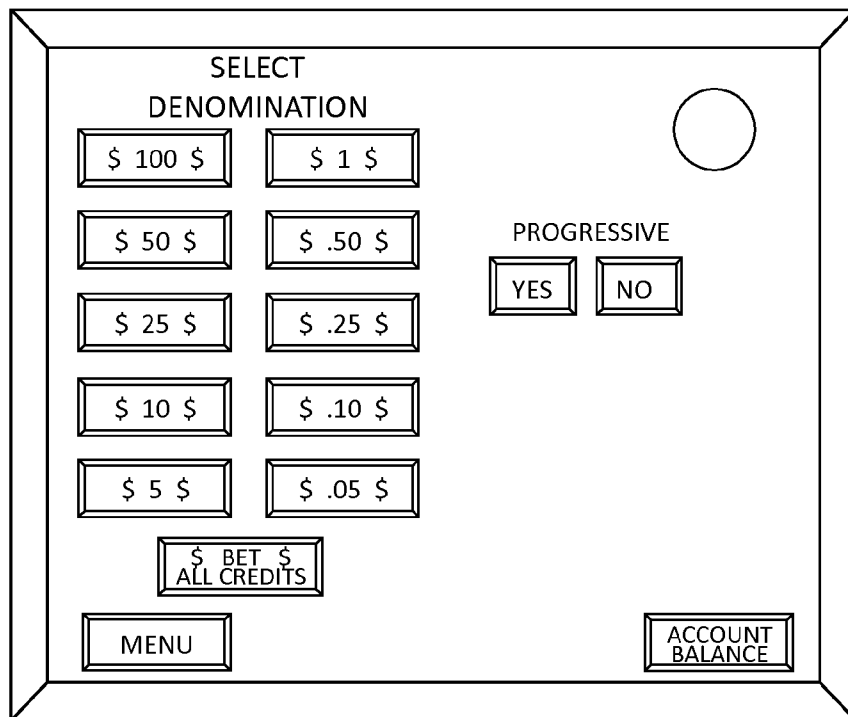


FIG. 8



900

FIG. 9



1000

FIG. 10

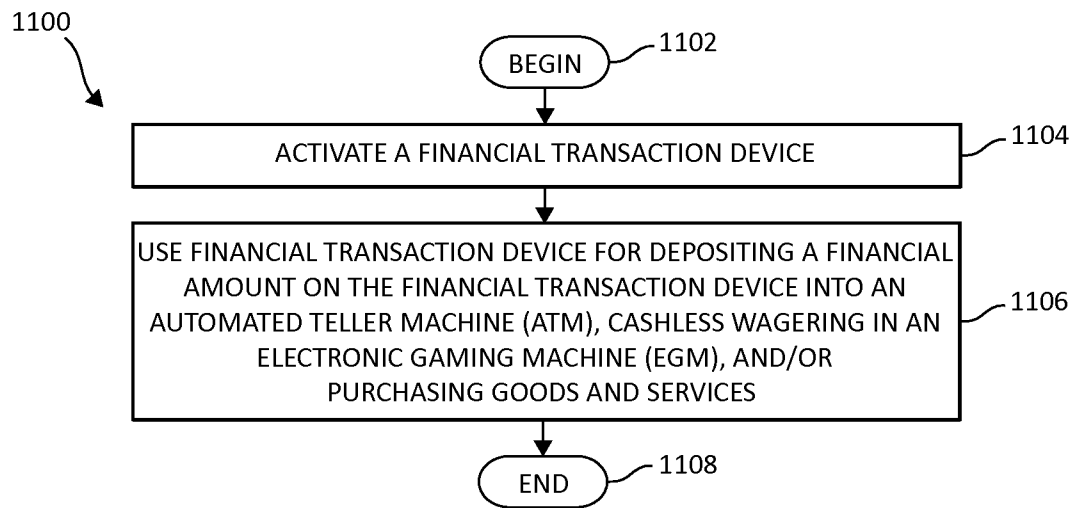


FIG. 11

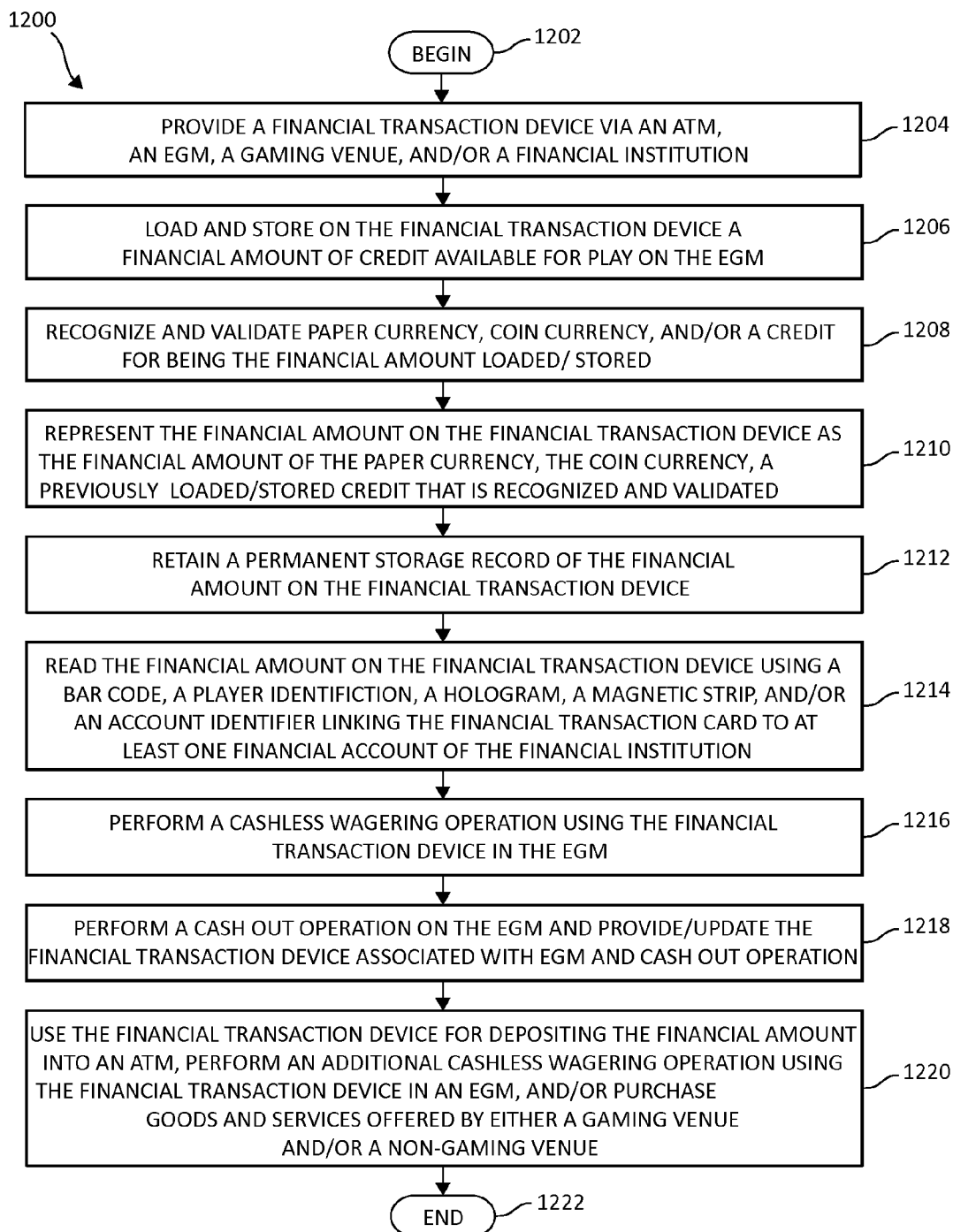


FIG. 12

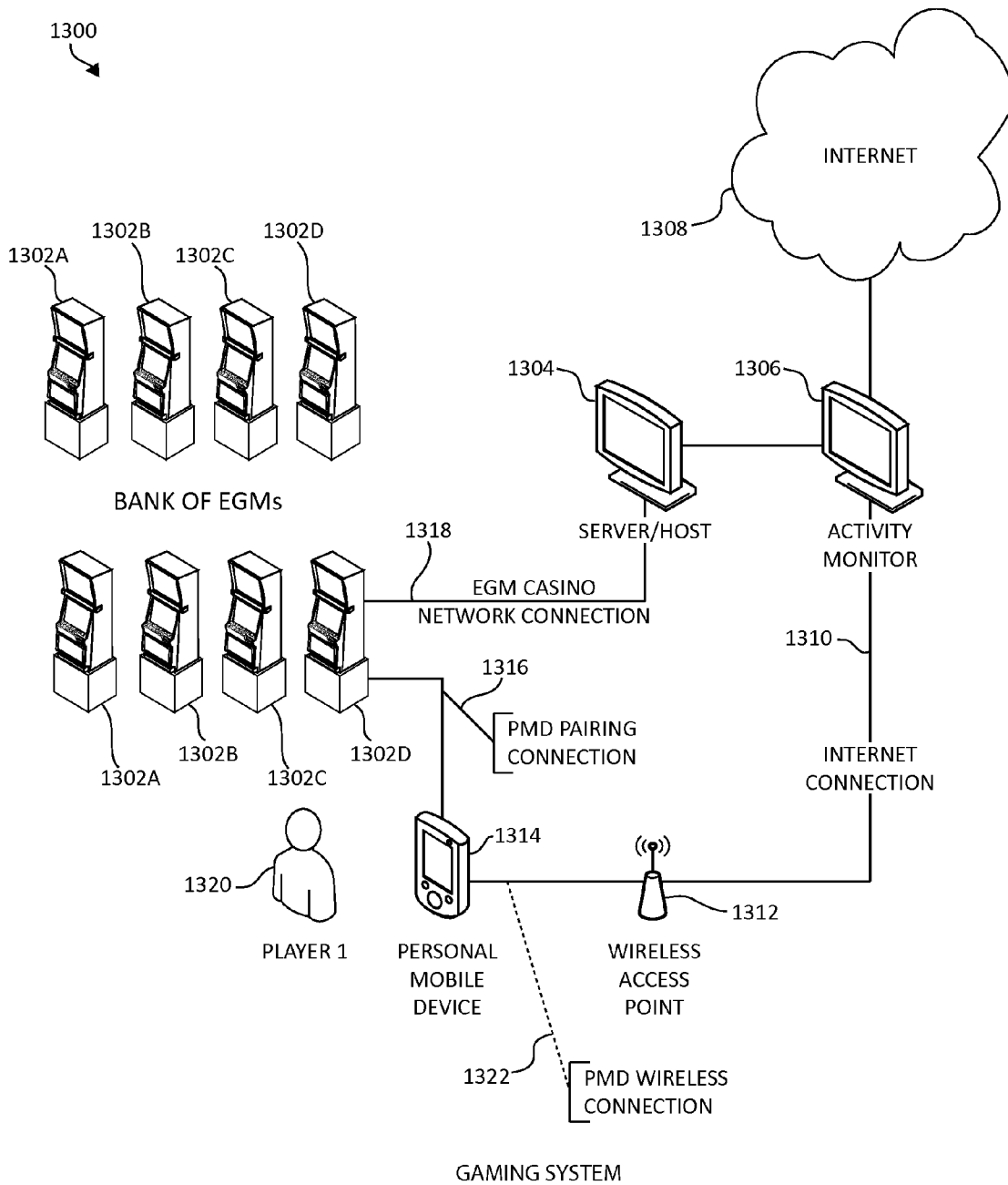


FIG. 13

1400

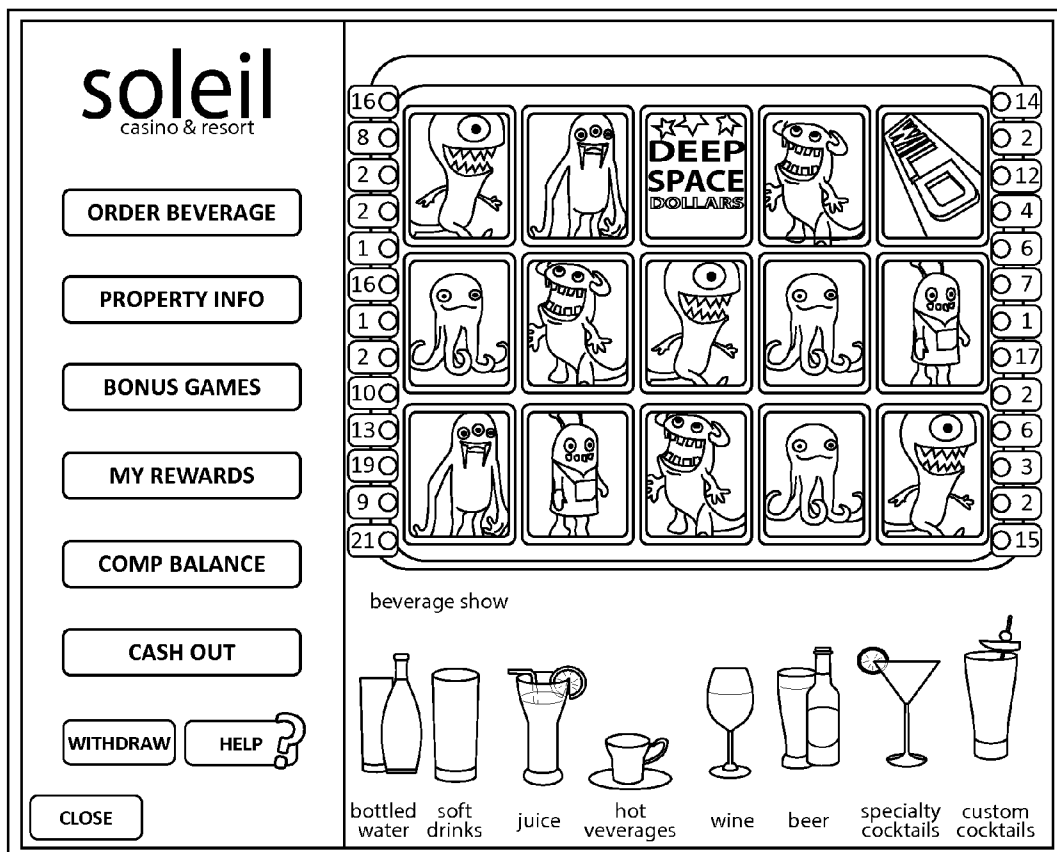


FIG. 14

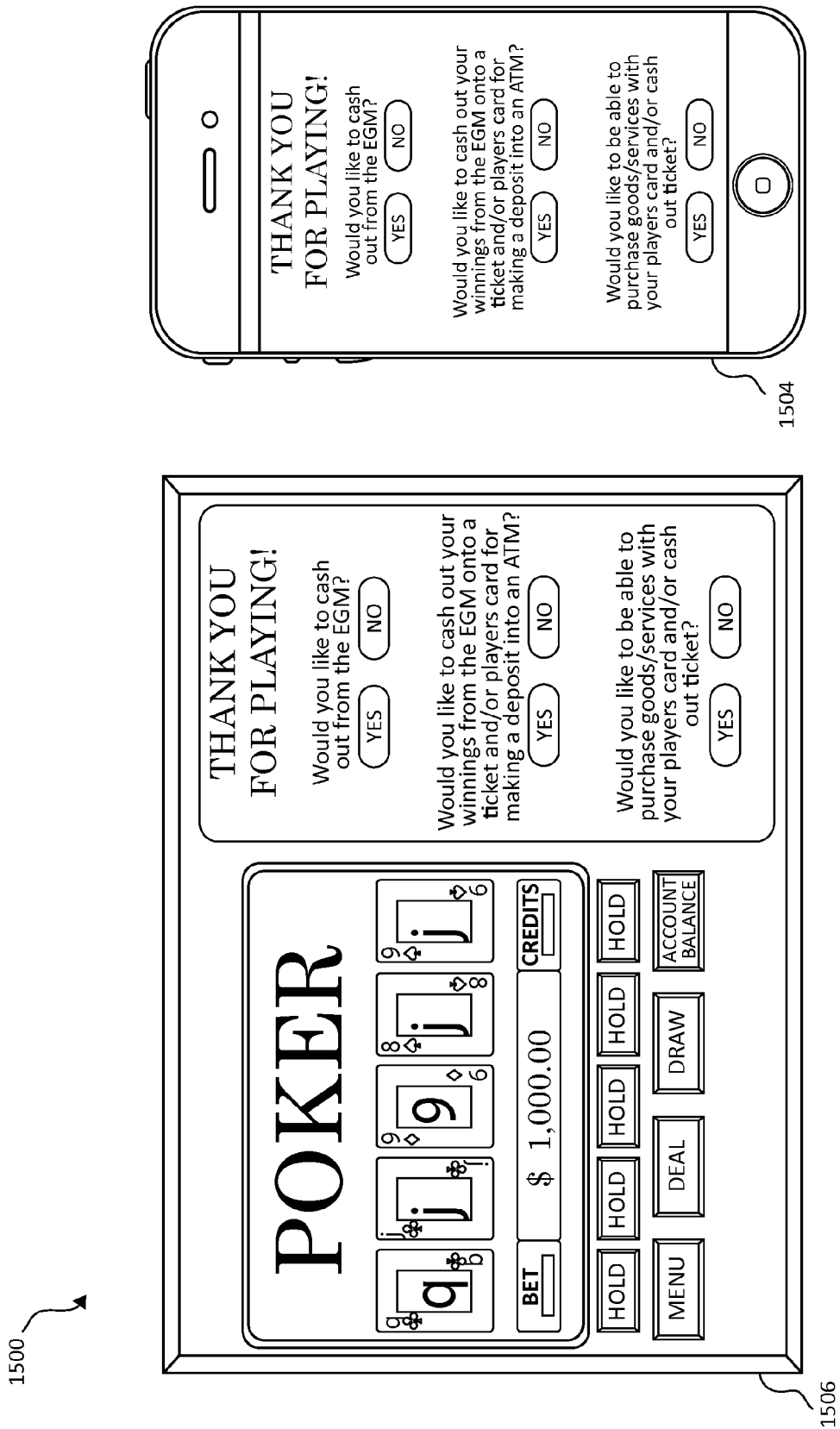


FIG. 15

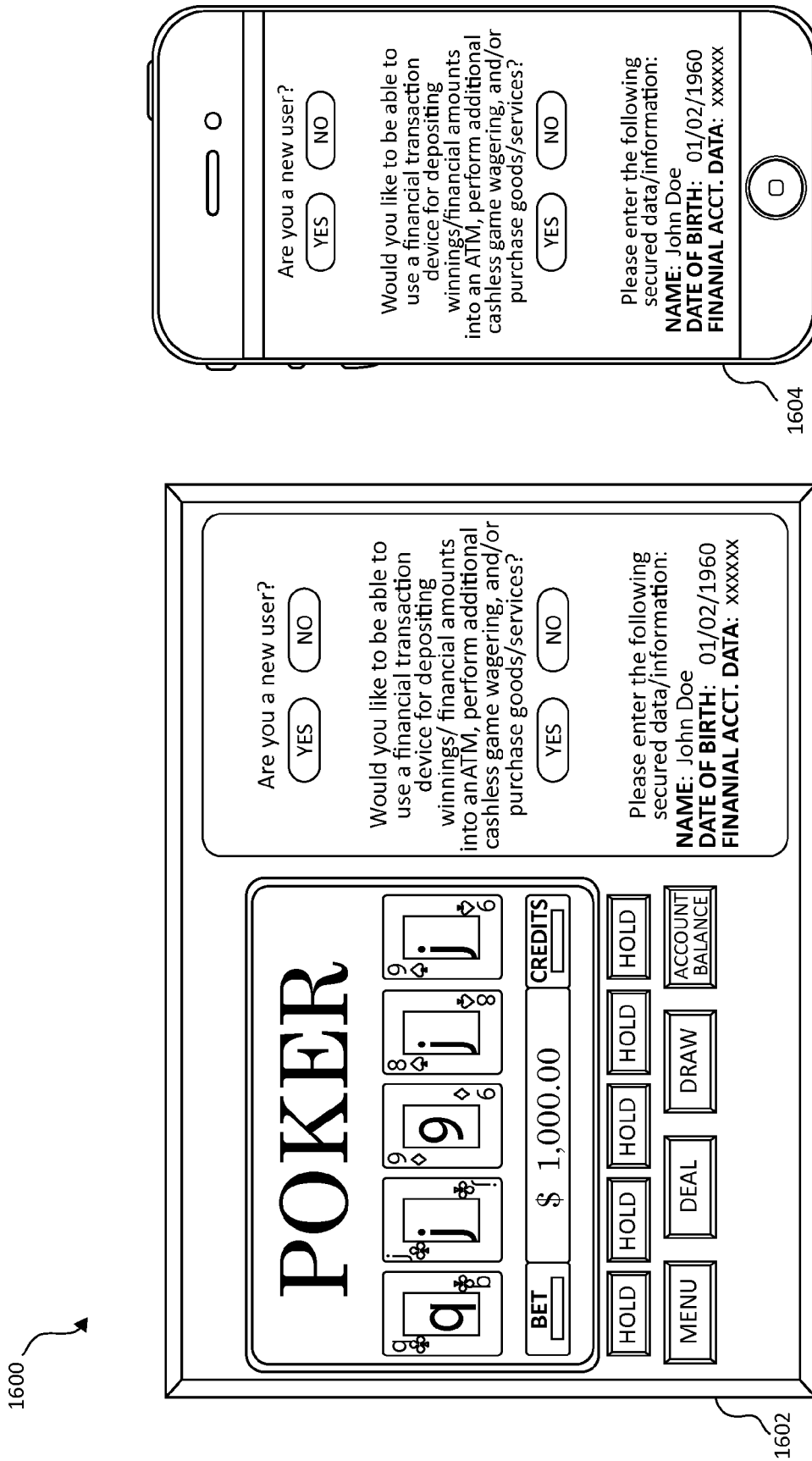


FIG. 16

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**FACILITATING USE OF A FINANCIAL
TRANSACTION DEVICE IN A CASHLESS
WAGERING SYSTEM IN A GAMING SYSTEM**

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BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates in general to gaming devices and systems, and more particularly to facilitating use of a financial transaction device of a cashless wagering system in a gaming system.

2. Description of the Related Art

Games of chance have been enjoyed by people for many years and have undergone increased and widespread popularity in recent times. As with most forms of entertainment, some players enjoy playing a single favorite game, while others prefer playing a wide variety of games. In response to the diverse range of player preferences, gaming establishments commonly offer many types of electronic games. Many electronic gaming machines (EGMs), such as electronic gaming machines and video poker machines, have been a cornerstone of the gaming industry for several years. The EGMs are computer based and contain multiple external interfaces for connecting with external devices and mobile devices.

SUMMARY OF THE DESCRIBED
EMBODIMENTS

A current challenge for gaming institutions, in view of increasingly popular use by players, and an increasing number of electronic gaming machines (EGM) and the like in gaming environments, is advantageously providing the EGMs, especially microprocessor-based gaming machines that store gaming programs for operating and using the EGM, with the flexibility and capabilities of communicating with external devices. As the gaming industry becomes more mobile it is likely that players will be using their various external devices (e.g., mobile devices such as cell phones and the like) in Casinos and other gaming venues and also desire to gain quicker access to winnings from the various games played. Also, there are many use cases for players, patrons, regulators, and/or operators to use an external application (e.g., a mobile digital device, digital media extender, a smart phone, an electronic tablet, a player mobile device 'PMD', a computer, and the like). As such, a need exists for facilitating use of a financial transaction device of a cashless wagering system in a gaming system.

To address these aforementioned needs, in one embodiment, by way of example only, methods, systems, and computer program products are provided for use of a financial transaction device of a cashless wagering system is facilitated in a gaming system. In one embodiment, by way of example only, the financial transaction device, having at least an account identifier linking the financial transaction device to at least one financial account of at least one financial institution, is provided (e.g., provided by an electronic gaming machine (EGM), a financial institution, and/or a gaming and/or non-

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gaming venue) for depositing the financial amount into at least one financial account, performing a cashless wagering operation in the EGM, and/or using the financial transaction device for payment of goods and services by gaming and non-gaming venues. Providing the financial card readies and/or allows the financial transaction device for use for depositing the financial amount into the at least one financial account, cashless wagering in the EGM, and/or payment of the goods and the services. The financial transaction device is used for depositing the financial amount into at least one financial account of the at least one financial institution associated with the gaming network by either the EGM and/or the ATM, performing a cashless wagering operation in the EGM, and/or purchasing the goods and services.

The foregoing summary has been provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter. The claimed subject matter is not limited to implementations that solve any or all disadvantages noted in the background.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the advantages of the invention will be readily understood, a more particular description of the invention briefly described above will be rendered by reference to specific embodiments that are illustrated in the appended drawings. Understanding that these drawings depict embodiments of the invention and are not therefore to be considered to be limiting of its scope, the invention will be described and explained with additional specificity and detail through the use of the accompanying drawings, in which:

FIG. 1 is a block diagram illustrating a gaming system environment with a gaming terminal data repository (GTDR) connected via one or more network interface(s) to a gaming network which, for example, may include gaming devices (e.g., gaming terminals), in which aspects of the present invention may be realized;

FIG. 2 is a perspective view of one embodiment of a EGM or gaming device suitable for use in the gaming system of FIG. 1, in which aspects of the present invention may be realized;

FIG. 3A is a block diagram illustrating an electronic configuration for use in the gaming device of FIG. 2, in which aspects of the present invention may be realized;

FIG. 3B is a block diagram illustrating player stations in communication with a central controller and a central display in communication with the central controller for use in the gaming device of FIG. 2, in which aspects of the present invention may be realized;

FIG. 4 is a schematic block diagram of a server-based gaming network in which aspects of the present invention may be realized;

FIG. 5 is a diagrammatic block diagram of the system in which aspects of the present invention may be realized;

FIG. 6 is a block diagram illustrating a financial transaction device as a cash out slip from an electronic gaming machine (EGM) in which aspects of the present invention may be realized;

FIG. 7 is a block diagram illustrating a financial transaction device as a coupon capable of being used with the electronic gaming machine (EGM) in which aspects of the present invention may be realized;

FIG. 8 is a block diagram illustrating of a financial transaction device as a jackpot winner cash out slip from the

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electronic gaming machine (EGM) of the present invention in which aspects of the present invention may be realized;

FIG. 9 is a block diagram illustrating menu screens capable of being displayed relating to use of the financial transaction device in which aspects of the present invention may be realized;

FIG. 10 is a block diagram illustrating menu screens capable of being displayed relating to use of the financial transaction device in which aspects of the present invention may be realized;

FIG. 11 is a flow chart illustrating an exemplary method for facilitating use of a financial transaction device in which aspects of the present invention may be realized;

FIG. 12 is a flow chart illustrating an alternative exemplary method for facilitating use of a financial transaction device in which aspects of the present invention may be realized;

FIG. 13 is a block diagram illustrating an alternative gaming system which contains multiple EGMs in which aspects of the present invention may be realized;

FIG. 14 is a block diagram illustrating a service screen window including a game screen for play on an electronic gaming machine (EGM) in which aspects of the present invention may be realized;

FIG. 15 are block diagrams illustrating an exemplary service screen application and an external application displaying various electronic gaming machines (EGMs) options on a personal mobile device (PMD) and/or an electronic gaming machine (EGM) for use with the financial transaction device in which aspects of the present invention may be realized; and

FIG. 16 are block diagrams illustrating an alternative exemplary service screen application and an external application displaying various electronic gaming machines (EGMs) options on a personal mobile device (PMD) and/or an electronic gaming machine (EGM) for use with the financial transaction device in which aspects of the present invention may be realized.

DETAILED DESCRIPTION OF THE DRAWINGS

In general, gaming machines require a player to place or make a wager to activate a primary or base game. The award may be based on the player obtaining a winning symbol or symbol combination and on the amount of the wager (e.g., the higher the wager, the higher the award). Symbols or symbol combinations that are less likely to occur usually provide higher awards. In such gaming machines, the amount of the wager made on the base game by the player may vary. For instance, a gaming machine may allow the player to wager a minimum number of credits, such as one credit (e.g., one penny, nickel, dime, quarter or dollar) up to a maximum number of credits, such as five credits. The player may make this wager a single time or multiple times in a single play of a primary game. For instance, a slot game may have one or more pay lines and the slot game may allow the player to make a wager on each pay line in a single play of the primary game. Slot games with 1, 3, 5, 9, 15 and 25 lines may be provided. Thus, a gaming device, such as a slot game, may allow players to make wagers of substantially different amounts on each play of the primary or base game ranging, for example, from one credit up to 125 credits (e.g., five credits on each of 25 separate pay lines). This is also true for other wagering games, such as video draw poker, where players can wager one or more credits on each hand and where multiple hands can be played simultaneously. Different players play at substantially different wagering amounts or levels and at substantially different rates of play.

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Secondary or bonus games may also be provided in the gaming machines. The secondary or bonus games may provide an additional award to the player. Secondary or bonus games may not require an additional wager by the player to be activated. Secondary or bonus games may be activated or triggered upon an occurrence of a designated triggering symbol or triggering symbol combination in the primary or base game. For instance, a bonus symbol occurring on the pay line on the third reel of a three-reel EGM may trigger the secondary bonus game. When a secondary or bonus game is triggered, the gaming machines may indicate this to the player through one or more visual and/or audio output devices, such as the reels, lights, display units, speakers, video screens, etc. Part of the enjoyment and excitement of playing certain gaming machines is the occurrence of the secondary or bonus game (even before the player knows how much the bonus award will be). In other words, obtaining a bonus award is part of the enjoyment and excitement for players.

Progressive awards may also be provided in gaming machines. A progressive award may be an award amount that includes an initial amount funded by a casino and an additional amount funded through a portion of each wager made on the progressive gaming machine. For example, 1% to 5% of each wager placed on the primary game of the gaming machine associated with the progressive award may be allocated to the progressive award or progressive award fund. The progressive award grows in value as more players play the gaming machine, and thus, portions of these players' wagers are allocated to the progressive award. When a player obtains a winning symbol or symbol combination, which results in the progressive award, the accumulated progressive award is provided to the player. After the progressive award is provided to the player, the amount of the next progressive award may be reset to an initial value, a predetermined value, or randomly generated value, and a portion of each subsequent wager on a gaming machine associated with the progressive is allocated to the next progressive award as described above.

A progressive award may be associated with a single gaming machine or multiple gaming machines which each contribute portions of the progressive award. The multiple gaming machines may be in the same bank of machines, in the same casino or gaming establishment (usually through a local area network ("LAN")) or in two or more different casinos or gaming establishments (usually through a wide area network ("WAN")). Such progressive awards are sometimes called local area progressive ("LAP") and wide area progressive ("WAP"), respectively. Progressive awards may increment through communication between a progressive controller and one or more gaming machines. The gaming machines associated with the progressive award transfer coin-in information to a progressive controller. From this information, the progressive controller calculates how much to increment the progressive award based on a set increment rate and then increments the progressive award accordingly. The gaming machines may provide the player a choice between different wager levels prior to the commencement of a primary game. The different wager levels enable the player to win different progressive awards. The gaming devices provide a progressive jackpot where the value of the jackpot may increase by a particular amount for every game played. Thus, when multiple gaming devices are linked together to form one large progressive jackpot, the jackpot grows more quickly because multiple players are contributing to the jackpot at the same time.

In one embodiment, there may be one or more various types of EGM machines, each having a variety of gaming themes, on any casino floor (and/or other gaming venue)

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using the above described gaming systems. The EGMs may use the various gaming award systems, jackpots, progressive jackpots, and/or other type of gaming systems and awards. As mentioned above, users of the various gaming devices (e.g., an EGM) have a general interest in, and may expend resources trying to identify, which of these various and preferred EGMs are paying out the largest and most frequent awards and/or progressive jackpots. As such, each of the EGMs may provide in real time, to a user, one or more of the user's favorite and/or preferred EGMs, and/or a list of EGM devices available and/or unavailable in the gaming venue, in order to play one or more of the favorite and/or preferred EGMs (e.g., the EGM labeled as "Wheel of Fortune®").

Moreover, in one embodiment, the EGMs provide for a cashless wagering gaming environment. For example, in one embodiment, a cashless wagering system is a method of wagering and accounting in which the validity and value of a wagering instrument or wagering credits are determined, monitored, and retained by a computer (e.g., a computer associated with an EGM and/or the EGM itself) that may be operated and maintained by a licensee. Under this system a record is maintained of each transaction involving the wagering instrument or wagering credits, exclusive of the game or gaming device on which wagers are being made. In one embodiment, the cashless wagering gaming system may facilitate electronic transfers of money directly to and/or from a game or gaming device (e.g., the EGM). For example, in one embodiment, by way of example only, the EGM may be activated without any coins being inserted into the EGM. The EGMs of the present invention may include an optical paper currency reader and/or financial transaction device reader that is capable of recognizing and validating paper currency and/or credit from a card like device and provide the player with the credit corresponding to the value of the currency and/or credit type card like device. The EGM may include at least one type of financial transaction device reader (e.g., a bar code reader, a hologram identifier, a biometric reader, magnetic strip reader, a scanner, and the like) that may read, identify, and validate a financial transaction device (e.g., which may be a ticket-in/ticket-out (TITO) system, a pre-paid card device, a players club card, an identification card, a financial account deposit device, pre-printed free play coupons, lottery tickets, and/or printed cash out slips previously printed and/or provided by the gaming venue with a bar code representing the value of the financial transaction device (e.g., a coupon or cash out slip). In one embodiment, the financial transaction device has at least one a bar code, a magnetic strip, a financial amount, and/or an account identifier, and the financial transaction device may be provided by the EGM, at least one financial institution, a gaming venue, and/or a non-gaming venue. The EGM may also include a printer that prints and dispenses the financial transaction device (e.g., the cash out slips having the value of the cash out slip represented by a bar code) and/or a device for creating and/or generating a plastic card like device as the financial transaction device. A Central Processing Unit (CPU) associated with the EGM may control the printer, reader, creator/generator, financial transaction device reader, and/or a financial transaction device reader on an automated teller machine (ATM).

Each individual EGM may collect the EGM data and/or the financial transaction device data, such as the codes from the bar codes and the output of the paper currency reader and formats it and then transmits it to the CPU. The CPU may be located in a remote environment in a gaming network of the gaming venue (e.g., a secured office at the gaming venue). The financial transaction device (e.g., plastic cards, printed cash out slips, coupons etc.) may be accepted by an EGM in

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order to obtain credit to play the EGM and/or may be inserted and/or scanned into a separate device at a change station to obtain actual currency. The bar code, the magnetic strip, the financial amount, and/or the account identifier representing the value of the financial transaction device (e.g., a free play coupon and/or cash out slip) may be augmented by a unique control number randomly generated by the EGM and/or CPU and/or a unique number associated with a player via a player's profile associated with the financial transaction device, the gaming venue, and/or financial institution. When the financial transaction device (e.g., the players card, the coupon or cash out slip) is put into the financial transaction device reader, the EGM, via a processing device, verifies the validity of the individual financial transaction devices (e.g., coupons and cash out slips) by verifying the unique control number, the bar code, the magnetic strip, the hologram, the financial amount, and/or the account identifier representing the value of the financial transaction device. Additionally, control numbers for the financial transaction device (e.g., the free play coupons) may be generated externally and/or internally to the gaming and non-gaming venues, and/or the various financial institutions and then entered into the EGM as valid codes.

Given the flexibility of a cashless wagering system for the EGM, there is a greater need for using the financial transaction device beyond mere cashless wagering. For example, a need exists for allowing a gaming venue to partner with a financial institution to enable the financial transaction device to be deposited into an automated teller machine (ATM). In one embodiment, an ATM, which may be associated with the gaming and/or non-gaming venues, is provided for receiving a financial transaction device for depositing the amount on the financial transaction device into a players financial account. In one embodiment, an ATM, which may be associated with the gaming and/or non-gaming venues, is fitted with a financial transaction device reader (e.g., a TITO reader, bar code reader, a magnetic strip reader and the like) for reading and depositing the financial amount on the financial transaction device into the ATM. For example, when a player, using one of the EGMs, performs a cash out ("cashes out") operation, the financial transaction device (e.g., a ticket printed from the EGM, the players club card, debit/credit card device, etc.), having the new and/or an updated financial amount loaded and stored thereon from the EGM, and is then inserted into the ATM, the financial amount on the financial transaction device is deposited into the ATM (e.g., similar to the process the ATM uses to accept currency). In one embodiment, various operational protocols may be used by the EGM and/or by the ATM based on one or more partnership agreements between the gaming venue and the financial institution. For example, both the gaming venue and the financial institutions may charge service fees thereby sharing in the revenues collected from financial institutions using the financial transaction device for depositing the financial amount into the ATM, and/or purchasing goods/services at a gaming and/or non-gaming venue. Moreover, players experience increased convenience by being able to deposit the cashed out values from the EGM directly into their respective bank accounts using the financial transaction device, and such flexibility for depositing the financial amount into the ATM, performing additional cashless wagering, and/or purchasing goods and/or services, increases players satisfaction for gaining access to the financial amounts on the financial transaction device and reduces demand on gaming venue operations staff overhead.

In one embodiment, the financial transaction device may also be used for purchasing the goods and services at both gaming and non-gaming venues. For example, in one

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embodiment, the financial transaction device may be used for purchasing lottery tickets, scratchers games, and/or keno tickets, buffet tickets, travel accommodations, events, food/beverages, and/or a variety of other types of goods and services. In one embodiment, the financial transaction device (e.g., a plastic card, coupon, a TITO ticket, etc.) may be used at a lottery kiosk to purchase a lottery ticket. The financial transaction device may also be used by various non-gaming vendors (e.g., hotels, restaurants, stores, event locations, concert venues, rental locations, various service(s) providers etc.) for purchasing the goods and services offered for sale and/or purchase.

In one embodiment, the present invention provides various methods, systems, and computer program products for facilitating use of a financial transaction device in a cashless wagering system in a gaming system/venue. In one embodiment, by way of example only, the financial transaction device, has at least an account identifier linking the financial transaction device to at least one financial account of at least one financial institution associated with the gaming network, is provided (e.g., provided by an electronic gaming machine (EGM), a financial institution, and/or a gaming and/or non-gaming venue) for depositing the financial amount into at least one financial account, performing a cashless wagering operation in the EGM, and/or using the financial transaction device for payment of goods and services by gaming and non-gaming venues. Providing the financial card ready and/or allows the financial transaction device for use for depositing the financial amount into the at least one financial account, perform cashless wagering in the EGM, and/or use for payment of goods and services. The financial transaction device may be used for depositing the financial amount into at least one financial account of at least one financial institution associated with the gaming and/or non-gaming venue into the EGM and/or the ATM, performing a cashless wagering operation in the EGM, and/or purchasing the goods and services.

In one embodiment, a financial institution (e.g., a bank, a credit union, and the like) and/or gaming venue may provide the financial transaction device. For example, in one embodiment, the player may go to a financial institution and acquire and/or update a debit card, credit card, and/or other similar type of specialized financial transaction device for use in a gaming and/or non-gaming environment. Previous agreements and/or protocols may be entered into between a gaming venue, non-gaming venues, and/or the financial institutions for using the financial transaction device. In one embodiment, by way of example only, the financial institution (e.g., a bank, a credit union, and the like) and/or the gaming venue may provide on the financial transaction device a bar code, an image, a magnetic strip, players account information for one or more gaming venues, an account identifier linking at least one financial account to the financial institution and/or gaming venue, a hologram, and/or other type of secured or unique device, image, code, number, and/or data. In one embodiment, the financial institution (e.g., a bank, a credit union, and the like) and/or the gaming venue activates the financial transaction device for performing cashless wagering in one or more gaming venues, purchasing goods/services at both gaming and non-gaming venues, and for depositing any financial amount on the financial transaction device into an ATM. In one embodiment, a credit limit may be allowed and/or a pre-paid amount may be uploaded onto the financial transaction device (e.g., the financial institution may allow for a \$1000 U.S. dollar credit limit available for use). It should be noted that a variety of types of financial transaction devices may be used according to need, technology, and/or gaming venue requirements. For example, the financial transaction

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device, provided by the financial institution is used in an EGM and has a credit limit of \$1000. The player enjoys several gaming options and is awarded a jackpot of \$1000. The financial transaction device is updated to show the \$1000 jackpot winnings including the \$1000 credit, which is still available. In one embodiment, the player may perform a cash out operation where the \$1000 jackpot credit is uploaded and stored onto the financial transaction device, provided by the financial institution. In one embodiment, the player may use the financial transaction device, provided by the financial institution, with the newly uploaded jackpot amount, is then used in the same and/or an alternative EGM. In one embodiment, the player may use the financial transaction device, provided by the financial institution, to purchase goods/services at a gaming and/or non-gaming venue, such as a restaurant, a hotel, an event, and/or travel, and the like. In one embodiment, the player may use the financial transaction device, provided by the financial institution, to deposit the financial amount into the ATM. Moreover, there may be legacy ATM systems, not equipped to recognize a plastic card like device acting as the financial transaction device, provided by the financial institution, and require an actual paper ticket printout, similar to those provided in the TITO system, to be used as the deposit slip for depositing the financial amount into the ATM. Thus, the player may have the TITO system print out a ticket/cash out slip with all and/or only a portion of the amount of financial amount of money from the financial transaction device, provided by the financial institution, and/or all and/or only a portion of the amount of financial amount of money from the EGM. For example, at the time of the cash out operation, the player may elect to have \$500 be stored and/or uploaded onto the financial transaction device (e.g., a plastic card), provided by the financial institution, and/or the remaining \$500 printed out onto a paper ticket. The player may then use the \$500 on the financial transaction device, provided by the financial institution, in one or more gaming and/or non-gaming venues, while depositing the printed cash out ticket into an ATM. The printed cash out ticket may contain the exact same information, such as the bar code, the magnetic strip, image, the players account information for one or more gaming venues, the account identifier linking at least one financial account to the financial institution and/or gaming venue, the hologram, and/or other type of secured data and the like, on the cash out slip for depositing into the ATM. In this way, the ATM is then able to receive the deposited ticket and deposit the amount of money into the player's financial account of one or more financial institutions (e.g., the player may even deposit the ticket into a separate financial institution using the tickets as compared to depositing the financial amount into the financial institution that provided the debit/credit card type financial transaction device). In one embodiment, the player may even use the printed cash out ticket to purchase goods/services at a non-gaming venue, such as a restaurant, an event, and/or travel, and the like, and/or perform additional cashless gaming, in the event the gaming and/or non-gaming venues recognize only paper/ticket type financial transaction devices (e.g., legacy EGMs do not recognize plastic card type financial transaction devices). In this way, greater flexibility is provided to a player for gaining immediate access to and/or use any and all financial amounts related to the gaming environments.

Turning now to FIG. 1, a block diagram illustrating a gaming system environment 100 is shown. Environment 100 includes a Gaming Terminal Data Repository (GTDR) connected via one or more network interface(s) to a gaming network which, for example, may include gaming devices (e.g., gaming terminals) and/or other devices, in which

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aspects of the present invention may be realized. As illustrated in FIG. 1, the gaming environment 100 may comprise a gaming system/environment 122 located in a physical environment (not shown). It will be appreciated that the communications links between the various components may be separate and distinct or may be commonly used. It will also be appreciated that one or more of the functions or applications described above may be consolidated, such as at a common server or host. Further, other components for implementing other functionality may be provided. For example, a variety of computing devices, such as user stations, may be connected to the various systems. Printers and other peripheral devices may also be connected to each network or system. A gaming system/environment 122 may be located at least partially in one or more physical gaming environments, such as a casino, restaurant, and/or convenience store. For example, the casino may include publicly accessible game areas where certain of the gaming system devices 124, such as gaming machines 125 and table games 127 are located, as well as secure areas where the servers and other components are located.

In one embodiment, the physical environment includes at least a portion of a physical structure, such as casino, housing one or more components of the gaming system/environment 122. The gaming system/environment 122 includes one or more gaming system devices 124 or components. The gaming system devices 124 may include gaming machines 125, such as those known as video or electronic gaming machines. The devices 124 may also include "table" games 127 such as Blackjack and Roulette. The gaming devices 124 may also include components or devices such as player tracking card readers 129, coin counters and other gaming devices functionality options, which devices or components may be linked or associated with other devices. The devices or components may also comprise computers or servers and communication equipment, cashier and accounting workstations and a wide variety of other elements.

In one embodiment, the gaming system/environment 122 may include a variety of sub-systems. These sub-systems may be partially or fully independent of one another or may be related. In one embodiment, each system may be included or be part of a network. In one embodiment, the gaming system/environment 122 may include a game presentation/operation system, which includes at least one game server 126. The game server 126 may comprise a computing device including a processor and a memory. The game server 126 may be adapted to perform a variety of functions. This functionality may be implemented by software and/or hardware of the server 126. In one embodiment, the game server 126 may be arranged to provide information or instructions to the one or more gaming devices 124 or individual gaming system components. The information may comprise game code and control data. In one embodiment, the game server 126 may also be arranged to accept information from the gaming devices 124 or components. For example, the game sever 126 may accept information regarding the status of operation of a particular gaming system device 124 (such as "normal" or "malfunction").

In one embodiment, the game server 126 is part of a network, which includes a communication link between the game server 126 and selected gaming system device(s) 124 and/or other component(s) with which communication is desired. A communication interface may be associated with the game server 126 and each device or component for facilitating the communication. The communication interfaces may have a variety of architectures and utilize a variety of protocols such as IEEE-1394 (FireWire™) or Ethernet in the case where the communication link is a wired link, or a

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wireless link utilizing a wireless protocol such as WIFI, Bluetooth™, Radio Frequency (RF), Infrared, etc. The communication links may transmit electrical, electromagnetic or optical signals, which carry digital data streams, or analog signals representing various types of information. In one embodiment, such as when the gaming device 124 comprises a gaming machine 125, the device 124 may include a master gaming controller, which controls the functions of game operation. The communication interface may be associated with the master gaming controller, permitting data to be transmitted between the game server 126 and the master gaming controller.

In one embodiment, the gaming system/environment 122 may include a player tracking system, which includes at least one player-tracking server 128. The player-tracking server 128 may also comprise a computing device including a processor and a memory. The player-tracking server 128 may be adapted to perform player-tracking functions. For example, the player-tracking server 128 may store information regarding the identities of players and information regarding the game play of those players. This information may include time of play, coin in/coin out or other monetary transaction data, and in an arrangement where players are awarded points based on play, a player's point total. Once again, the player tracking system includes a network comprising a communication link provided between the player tracking server 128 and one or more of the gaming devices 124 having a player tracking function or other components of the gaming system/environment 122 associated with the system. In one embodiment, such as where the gaming device 124 comprises a gaming machine, the device may include a management interface board, which controls a card reader. The management interface board may be arranged to receive data from the master gaming controller of the gaming system device 124. A communication interface is associated with the management interface board, permitting data to be transmitted between the player tracking server 128 and the management interface board.

In the case of table games, a card reader 129 may be associated with the table (e.g., the card reader located on or near the table game). Players may utilize the card reader to identify themselves. Information regarding play of the table game may be input through an input device by a dealer, coin counter or the like, and this information may be transmitted to the player tracking server 128.

In one embodiment, the gaming system/environment 122 may include an accounting system, which includes at least one accounting server 130. The accounting server 130 may comprise a computing device including a processor and a memory. The accounting server 130 is preferably adapted to perform financial related functions, such as track financial transactions such as bets and payouts, and perform reconciliations with monies collected from the gaming system devices 124, such as gaming machines 125, tables games 127. The accounting server 30 may be associated with a wide variety of devices, including individual gaming system devices 124 and other servers. Once again, a communication link may be provided between the accounting server 130 and each device with which communications is desired.

In one embodiment, the gaming system/environment 122 may include a progressive award system, which includes at least one progressive server 132. The progressive sever 132 may comprise a computing device including a processor and a memory. The progressive server 132 may be designed to generate progressive award information. In one arrangement, the progressive server 132 may obtain information regarding amounts bet at specific gaming system devices 124, such as

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gaming machines **125** or table games **127**. Utilizing this information, a progressive jackpot award amount may be generated and updated using a specified protocol. The information may be transmitted to one or more displays **134** associated with participating devices **124**. Once again, a communication link is preferably provided between the progressive server **132** and each device with which communications is desired. For example, a link may be provided between the progressive server **132** and accounting server **130** for providing payout information to the accounting server **130**. The accounting server **130** also reads the paid amounts from the electronic gaming machines **125** as well and makes sure the paid amounts match what the progressive server claimed the paid amounts should have been. If the paid amounts don't match, then the accounting server **130** may raise a flag for further investigation by casino staff or regulators.

A physical and/or virtual information host **136** is associated with or comprises a portion of the gaming system/environment **122**. In one embodiment, the host **136** comprises a computing device, which includes a processor, memory and a display. The virtual information host **136** may be one or more devices separate from devices performing other functions of the system/environment **122**, or may be integrated with existing devices. The virtual information host **136** may be designed and adapted to perform functions relating to acquiring, managing, rendering, generating and/or displaying real-time and/or non real-time casino gaming system or "gaming environment" graphical information and information regarding one or more components of the gaming system or environment. Such functionality may also include the generation of at least one graphical user interface on at least one mobile device (e.g., **131**), which is configured or designed to graphically display information (e.g., real-time casino information) relating to selected aspects of casino activity. Also, different graphical user interfaces may be displayed on an external application, such as on an application of a computer, smart phone, and/or on any type of mobile device **131**. In one embodiment, bi-directional communication channels **121** are provided for direct, two-way communication between the host **136** and at least one game server **126** and at least one player-tracking server **128**, and/or any other device with which communications is desired.

As illustrated in the example of FIG. 1, gaming system/environment **122** may also include one or more mobile devices **131** configured or designed to communicate, via one or more wireless links **111**, with various components of the gaming environment **100** such as, for example: information systems (e.g., virtual information host **136**); player tracking systems; accounting systems; employee management systems; location positioning systems (e.g., GPS system **133**); game servers; surveillance systems; security systems; communications systems; gaming systems (e.g., gaming machines **125**, game table devices **127**, other mobile devices **125**, etc.); etc.

FIG. 2 is a perspective view of one embodiment **210** of a slot machine, EGM, or gaming device suitable for use in the previously depicted system of FIG. 1, in which aspects of the present invention may be realized. FIG. 2 represents a base gaming device **210** that can be employed in the shared display system or the gaming system of the present invention is illustrated as gaming device **210**. FIG. 2 illustrates features common to each of the gaming devices. In one embodiment, gaming device **210** has a support structure, housing or cabinet, which provides support for a plurality of displays, inputs, controls and other features of a conventional gaming machine. In the illustrated embodiment, the player plays gaming device **210** while sitting, however, the gaming device

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is alternatively configured so that a player can operate it while standing or sitting. The illustrated gaming device **210** is positioned on the floor but can be positioned alternatively (i) on a base or stand, (ii) as a pub-style table-top game (e.g., where the participant gaming devices are located remotely from the shared wheel as discussed below), (iii) as a stand-alone gaming device on the floor of a casino with other stand-alone gaming devices, which the player operates while standing or sitting (e.g., where the participant gaming devices are located remotely from the shared wheel as discussed below), or (iv) in any other suitable manner. The gaming device **210** can be constructed with varying cabinet and display configurations. Also, referring to an embodiment for the electronic configuration of gaming device **210**, each gaming device may include the components described below in FIG. 3A and FIG. 3B.

In one embodiment, each gaming device **210** randomly generates awards and/or other game outcomes based on probability data. That is, each award or other game outcome is associated with a probability and each gaming device generates the award or other game outcome to be provided to the player based on the associated probabilities. Since each gaming device **210** generates outcomes randomly or based upon a probability calculation, there is no certainty that the gaming device **210** will provide the player with any specific award or other game outcome.

In another embodiment, as discussed in more detail below, each gaming device **210** employs a predetermined or finite set or pool of awards, progressive awards, prizes or other game outcomes. As each award or other game outcome is provided to the player, the gaming device **210** removes the provided award or other game outcome from the predetermined set or pool. Once removed from the set or pool, the specific provided award or other game outcome cannot be provided to the player again. The gaming device **210** provides players with all of the available awards or other game outcomes over the course of the play cycle and guarantees a designated amount of actual wins and losses.

As seen in FIG. 2, the gaming device **210** includes a credit display **220** that displays a player's current number of credits, cash, account balance or the equivalent. In one embodiment, gaming device **210** includes a bet display **222** that displays a player's amount wagered. As illustrated in FIG. 3A, in one embodiment, each gaming device **210** includes at least one payment acceptor **334** (FIG. 3A) that communicates with processor **322** (FIG. 3A).

As seen in FIG. 2, the payment acceptor **334** (FIG. 3A) in one embodiment includes a coin slot **226**, where the player inserts coins or tokens, and a ticket, note or bill acceptor **228**, where the player inserts a bar-coded ticket, note, or cash. In one embodiment, a player-tracking card, credit card, debit card or data card reader/validator **232** is also provided for accepting any of those or other types of cards.

In one embodiment, a player inserts an identification card into card reader **232** of gaming device **210**. The identification card can be a smart card having a programmed microchip or a magnetic strip coded with a player's identification, credit totals and other relevant information. In one embodiment, money may be transferred to gaming device **10** through an electronic fund transfer and card reader **232** using the player's credit, debit or smart card. When a player funds gaming device **210**, processor **322** (FIG. 3A) determines the amount of funds entered and the corresponding amount is shown on the credit or other suitable display as described above. In one embodiment, after appropriate funding of gaming device **210**, the player presses a play button **234** or pull arm (not illustrated) to start any primary game or sequence of events. In one embodiment, upon appropriate funding, gaming device **210**

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begins game play automatically. In another embodiment, the player needs to actuate or activate one of the play buttons to initiate play of gaming device 210.

As shown in FIG. 2, a bet one button 236 is provided. The player places a bet by pushing bet one button 236. The player increases the player's wager by one credit each time the player pushes bet one button 236. When the player pushes the bet one button 236, the number of credits shown in the credit display 220 decreases by one, and the number of credits shown in the bet display 222 increases by one. A max bet button (not shown) can also be provided, which enables the player to bet the maximum wager (e.g., max lines and max wager per line). Gaming device 210 may include other suitable wager buttons 230, such as a max bet button, a repeat bet button, one or more select paylines buttons and one or more select wager per payline buttons.

In one embodiment, a cash out button 238 is provided. The player presses cash out button 238 and cashes out to receive a cash payment or other suitable form of payment corresponding to the number of remaining credits. The player can receive coins or tokens in a coin payout tray 240 or a ticket or credit slip, which are redeemable by a cashier or funded to the player's electronically recordable identification card. Each gaming device 210 also includes one or a plurality of communication ports for enabling communication of a processor with one or more external peripherals, such as external video sources, expansion buses, expansion games or other displays, an SCSI port or a key pad.

In one embodiment of FIG. 2, in combination with in FIG. 3A, a touch-screen 352 (FIG. 3A) is provided in one embodiment and operates with a touch-screen controller 354, processor 322 (FIG. 3A) and display device 326, 328 (FIG. 3A). Touch-screen 352 (FIG. 3A) and the touch-screen controller 354 are also connected to a video controller 356. The player touches touch-screen 352 at appropriate places to input decisions and signals into processor 322 of gaming device 210. Also, each gaming device 210 may include a sound generating device controlled by one or more sounds cards 258, which function in conjunction with processor 322 (FIG. 3A). In one embodiment, the sound generating device includes at least one speaker 250 or other sound generating hardware and/or software for generating sounds, such as playing music for the primary and/or secondary game or for other modes of the gaming device, such as an attract mode. In one embodiment, each gaming device 210 provides dynamic sounds coupled with attractive multimedia images displayed on display device 216 to provide an audio-visual representation or to otherwise display full-motion video with sound to attract players to gaming device 210. During idle periods, the gaming device 210 displays a sequence of audio and/or visual attraction messages to attract potential players to gaming device 210. The videos in one embodiment are customized to provide information concerning the shared display of the present invention as discussed below.

In one embodiment, gaming device 210 includes a camera in communication with a processor, which is positioned to acquire an image of a player playing gaming device 10 and/or the surrounding area of gaming device 10. In one embodiment, the camera may be configured to selectively acquire still or moving (e.g., video) images and may be configured to acquire the images in either an analog, digital or other suitable format. Display device 216 may be configured to display the image acquired by the camera as well as display the visible manifestation of the game in split screen or picture-in-picture fashion. For example, the camera may acquire an image of the player and that image can be incorporated into the primary and/or secondary game as a game image, symbol or indicia.

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In one embodiment, as illustrated in FIG. 2, a base or primary game includes a slot game with one or more paylines 252. Paylines 252 may be horizontal, vertical, circular, diagonal, angled or any combination thereof. For a slot game, gaming device 210 displays at least one reel and preferably a plurality of reels 254, such as three to five reels, in either electromechanical form with mechanical rotating reels or in video form with simulated reels and movement thereof. Each reel 254 displays a plurality of indicia such as bells, hearts, fruits, numbers, letters, bars or other images, which preferably correspond to a theme associated with the gaming device. With a slot game, gaming device 10 awards prizes when reels 254 stop spinning and display a winning or paying symbol or combination of symbols on an active payline 252.

In one embodiment, each gaming device 210 includes indicators 260. Indicators 260 reside on the top of each gaming device 10 and point to or indicate one of the awards or outcomes on top of shared display (not shown) when the shared display stops spinning to reveal randomly or otherwise generated results or outcomes. Indicators 260 may illuminate differently at different times or states for the gaming device 210. The illumination of the indicator 260 in one embodiment depends upon whether the gaming device 210 is playing a base game, is in a state in which the player is eligible to play the shared display bonus, is in a state in which the player has committed to play the shared display bonus or is in a state in which the player has declined to play a particular upcoming shared display bonus, as well as other states discussed below.

FIG. 3A is a block diagram illustrating an electronic configuration for use in the gaming device of FIG. 2, here again in which aspects of the present invention may be realized. In the embodiment illustrated in FIG. 3A the player station may include at least one processor 322, such as a microprocessor, a microcontroller-based platform, a suitable integrated circuit or one or more ASICs. The processor 322 is in communication with or operable to access or to exchange signals with at least one data storage or memory device 324. In one embodiment, the processor 322 and the memory device 324 reside within the cabinet of the player station. The memory device 324 stores program code and instructions, executable by the processor 322, to control the player station. The memory device 324 also stores other data such as image data, event data, player input data, random or pseudo-random number generators, pay-table data or information and applicable game rules that relate to the play of the player station. In one embodiment, the memory device 324 includes random access memory (RAM), which can include non-volatile RAM (NVRAM), magnetic RAM (MRAM), ferroelectric RAM (FeRAM) and other forms as commonly understood in the gaming industry. In one embodiment, the memory device 324 includes read only memory (ROM). In one embodiment, the memory device 324 includes flash memory and/or EEPROM. Any other suitable magnetic, optical and/or semiconductor memory may operate in conjunction with the player station and gaming system disclosed herein.

In one embodiment, part or all of the program code and/or operating data described above can be stored in a detachable or removable memory device, including, but not limited to, a suitable cartridge, disk, CD ROM, DVD or USB memory device. In other embodiments, part or all of the program code and/or operating data described above can be downloaded to the memory device through a suitable network.

In one embodiment, an operator or a player can use such a removable memory device in a desktop computer, a laptop personal computer, a personal digital assistant (PDA), portable computing device, or other computerized platform to implement the present disclosure. In one embodiment, the

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gaming system is operable over a wireless network, such as part of a wireless gaming system. In this embodiment, the player station may be a hand held device, a mobile device or any other suitable wireless device that enables a player to play any suitable game at a variety of different locations. It should be appreciated that a player station as disclosed herein may be a device (e.g., EGM) that has obtained approval from a regulatory gaming commission or a device that has not obtained approval from a regulatory gaming commission. It should be appreciated that the processor and memory device may be collectively referred to herein as a “computer” or “controller.”

In one embodiment, a background play feature may be available where a player, who may be sitting at the lounge and/or at the bar with friends (at the casino) may be playing a machine from the floor by remote via the external application (e.g., a smart phone). The player may substitute into the same game he wanted from an IGT online game and play, or back-end the actual game though a venue network. The game may be bankrolled by the venue the player was inside. If the player was to win the player could collect from that venue where the player was located, and/or instead of “reserving” a machine he could continue the game with an auto play during a period of time the player took a break/recess. In one embodiment, a team game may be played by a group of players (e.g., a group of 3 or 4 players) and the group of players may watch and/or play the same game on each players individual external device (e.g., a computer and/or smart phone). Similarly, as described above, the team game may be played by a group of players from a remote location (e.g., bar, lounge, casino, home, office, restaurant, etc.). In one embodiment, the team game may be played by a group of players and the group of players may share credit inputs and wins. In one embodiment, the team game may be played by the group of players and the group of players may sell off and/or share double up options and/or credits to others team players of the group.

In one embodiment, as discussed in more detail below, the gaming device randomly generates awards and/or other game outcomes based on probability data. In one such embodiment, this random determination is provided through utilization of a Random Number Generator (RNG), such as a true random number generator, a pseudo random number generator or other suitable randomization process. In one embodiment, each award or other game outcome is associated with a probability and the player station generates the award or other game outcome to be provided to the player based on the associated probabilities. In this embodiment, since the player station generates outcomes randomly or based upon one or more probability calculations, there is no certainty that the player station will ever provide the player with any specific award or other game outcome. In another embodiment, each award or other game outcome is associated with a probability and the central controller or server generates the award or other game outcome to be provided to the player based on the associated probabilities. In one embodiment, each of the player stations includes an RNG and the central server controls the display of the central display. It should be appreciated there may be one or more RNG's per: (a) display segment; (b) central display; (c) player station; (d) number of games; (e) the number of potential games; or (f) any combination of the above. It should also be appreciated that one or more processors may work together and communicate to accomplish any suitable function of the gaming system.

In another embodiment, the gaming system employs a predetermined or finite set or pool of awards or other game outcomes. In this embodiment, as each award or other game outcome is provided to the player, the central controller flags or removes the provided award or other game outcome from

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the predetermined set or pool. Once flagged or removed from the set or pool, the specific provided award or other game outcome from that specific pool cannot be provided to the player again. This type of gaming system provides players with all of the available awards or other game outcomes over the course of the play cycle and guarantees the amount of actual wins and losses.

In one embodiment, as mentioned above and seen in FIG. 3A, one input device is a touch-screen 352 coupled with a touch-screen controller 354, or some other touch-sensitive display overlay to allow for player interaction with the images on the display. The touch-screen and the touch-screen controller are connected to a video controller 356. A player can make decisions and input signals into the player station by touching the touch-screen at the appropriate places. One such input device is a conventional touch-screen button panel. In another embodiment, a plurality or each of the display segments is a touch-screen 352 coupled with a touch-screen controller 354 or some other touch-sensitive display overlay to allow for player interaction with the images on the display segments. The touch-screens 352 and the touch-screen controllers 354 are connected to a video controller. The player station may further include a plurality of communication ports for enabling communication of the processor with external peripherals, such as external video sources, expansion buses, game or other displays, an SCSI port or a key pad. In one embodiment, at least one payment acceptor 324 that communicates with processor 322 for playing a bet, input devices 340, and display devices 326, 328 are provided.

The player stations, the central controller and the display segments may include serial interfaces and/or ethernet (e.g., G2S (game-to-system) protocol uses commodity Ethernet equipment and TCP/IP) to connect to specific subsystems or subnets internal and external to the player stations, central controller and the display segments. The serial devices may have electrical interface requirements that differ from the “standard” EIA serial interfaces provided by general-purpose computers. These interfaces may include EIA, Fiber Optic Serial, optically coupled serial interfaces, and current loop style serial interfaces, etc. In addition, to conserve serial interfaces internally in the player station, serial devices may be connected in a shared, daisy-chain fashion where multiple peripheral devices are connected to a single serial channel.

The serial interfaces and/or ethernet (e.g., G2S (game-to-system) protocol uses commodity Ethernet equipment and TCP/IP) may be used to transmit information using communication protocols that are unique to the gaming industry. For example, SAS is a communication protocol used to transmit information, such as metering information, from a player station to a remote device. Often SAS is used in conjunction with a player tracking system. EGMs may be treated as peripheral devices to a casino communication controller and connected in a shared daisy chain fashion to a single serial interface and/or ethernet. In both cases, the peripheral devices are preferably assigned device addresses. If so, the serial controller circuitry must implement a method to generate or detect unique device addresses. In one embodiment, security-monitoring circuits detect intrusion into a player station or gaming station by monitoring security switches attached to access doors in a designated area, such as a player station cabinet. In one embodiment, access violations result in suspension of game play and can trigger additional security operations to preserve the current state of game play. These circuits also function when power is off by use of a battery backup. In one embodiment, as seen in FIG. 3A, the player station includes a sound generating device controlled by one or more sounds cards 358 which function in conjunction with

the processor. In one embodiment, the sound generating device includes at least one and preferably a plurality of speakers **360** or other sound generating hardware and/or software for generating sounds, such as playing music for the primary and/or secondary game or for other modes of the player station, such as an attract mode. In one embodiment, the player station provides dynamic sounds coupled with attractive multimedia images displayed on one or more of the display devices to provide an audio-visual representation or to otherwise display full-motion video with sound to attract players to the player station. During idle periods, the player station may display a sequence of audio and/or visual attraction messages to attract potential players to the player station. The videos may also be customized for or to provide any appropriate information.

In one embodiment, the gaming system may include a sensor, such as a camera in communication with the processor (and possibly controlled by the processor) that is selectively positioned to acquire an image of a player actively using the player station and/or the surrounding area of the player station. In one embodiment, the camera may be configured to selectively acquire still or moving (e.g., video) images and may be configured to acquire the images in either an analog, digital or other suitable format. The display devices may be configured to display the image acquired by the camera as well as display the visible manifestation of the game in split screen or picture-in-picture fashion. For example, the camera may acquire an image of the player and the processor may incorporate that image into the primary and/or secondary game as a game image, symbol or indicia. In another embodiment, the gaming system includes a wireless transceiver or a camcorder and the display segments are components of or are connected to televisions, satellites, DVD players, digital video recorders and internet-enabled devices. In one embodiment, the game may be displayed on the central display and replicated on one or more the player stations. In another embodiment, the game is only displayed on the central display and the player station is only used to input decisions or commands in the game. In another embodiment, a primary or base game is displayed on the player station and/or the central display and one or more bonus games are displayed on the central display only. In one embodiment, the player stations provide other information to a player, such as the win/loss history of that certain games or the win/loss history of that player. It should be appreciated that the central display and the player stations may work together with a central controller or a plurality of servers to provide the games to the player in any suitable manner.

FIG. 3B is a block diagram illustrating a player station **320** in communication with a central controller and a central display **310** in communication with the central controller for use in the gaming device of FIG. 2, in which aspects of the present invention may be realized. In one embodiment, as illustrated in FIG. 3B, one or more of the player stations **320** are in communication with each other and/or at least one central server, central controller or remote host **366** through a data network or remote communication link **368**. The central server, central controller or remote host is any suitable server or computing device, which includes at least one processor and at least one memory or storage device, and may also be in communication with a central display **310**. In other embodiments, the central server is a progressive controller or a processor of one of the player stations in the gaming system. In these embodiments, the processor of each player station is configured to transmit and receive events, messages, commands, a current progressive value or any other suitable data or signal between the individual player station and the central

server. The player station processor is operable to execute such communicated events, messages or commands in conjunction with the operation of the player station. Moreover, the processor of the central server is configured to transmit and receive events, messages, commands or any other suitable data or signal between the central server and each of the individual player stations. The central server processor is operable to execute such communicated events, messages or commands in conjunction with the operation of the central server. It should be appreciated that one or more of each of the functions of the central controller may be performed by one or more player station processors. It should be further appreciated that each of the functions of the player station processors, as disclosed herein, may be performed by the central controller. In one embodiment, the central controller has an Uninterruptible Power Supply ("UPS"). In one embodiment, the UPS is a rack mounted UPS module.

In one embodiment, the game outcome provided to the player is determined by a central server or controller and provided to the player at the player station. In this embodiment, each of the player stations is in communication with the central server or controller. Upon a player initiating game play at one of the player stations, the initiated player station communicates a game outcome request to the central server or controller. In one embodiment, the central server or controller receives the game outcome request and randomly generates a game outcome for the primary game based on probability data. In another embodiment, the central server or controller randomly generates a game outcome for the secondary game based on probability data. In another embodiment, the central server or controller randomly generates a game outcome for both the primary game and the secondary game based on probability data. The central server or controller is capable of storing and utilizing program code or other data similar to the processor and memory device of the player station. In an alternative embodiment, the central server or controller maintains one or more predetermined pools or sets of predetermined game outcomes. The central server or controller receives the game outcome request and independently selects a predetermined game outcome from a set or pool of game outcomes. The central server or controller flags or marks the selected game outcome as used. Once a game outcome is flagged as used, it is prevented from further selection from the set or pool and cannot be selected by the central controller or server upon another wager. The provided game outcome can include a primary game outcome, a secondary game outcome, primary and secondary game outcomes, or a series of game outcomes. The central server or controller communicates the generated or selected game outcome to the initiated player station. The player station receives the generated or selected game outcome and provides the game outcome to the player. In an alternative embodiment, how the generated or selected game outcome is to be presented or displayed to the player, such as a reel symbol combination of a player station or a hand of cards dealt in a card game, is also determined by the central server or controller and communicated to the initiated player station to be presented or displayed to the player. Central production or control can assist a gaming establishment or other entity in maintaining appropriate records, controlling gaming, reducing and preventing cheating or electronic or other errors, reducing or eliminating win-loss volatility.

In one embodiment, the player stations disclosed herein are associated with or otherwise integrated with one or more player tracking systems. In this embodiment, the player station and/or player tracking system tracks players gaming activity at the player station. In one such embodiment, the

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player station and/or associated player tracking system timely tracks when a player inserts their playing tracking card to begin a gaming session and also timely tracks when a player removes their player tracking card when concluding play for that gaming session. In another embodiment, rather than requiring a player to insert a player-tracking card, the player station utilizes one or more portable devices carried by a player, such as a cell phone, a radio frequency identification tag or any other suitable wireless device to track when a player begins and ends a gaming session. In another embodiment, the player station utilizes any suitable biometric technology or ticket technology to track when a player begins and ends a gaming session. During one or more gaming sessions, the player station and/or player tracking system tracks any suitable information, such as any amounts wagered, average wager amounts and/or the time these wagers are placed. In different embodiments, for one or more players, the player tracking system includes the player's account number, the player's card number, the player's first name, the player's surname, the player's preferred name, the player's player tracking ranking, any promotion status associated with the player's player tracking card, the player's address, the player's birthday, the player's anniversary, the player's recent gaming sessions, or any other suitable data. The player stations are capable of being connected together through a data network. In one embodiment, the data network is a local area network (LAN), in which one or more of the player stations are substantially proximate to each other and an on-site central server or controller as in, for example, a gaming establishment or a portion of a gaming establishment. In another embodiment, the data network is a wide area network (WAN) in which one or more of the player stations are in communication with at least one off-site central server or controller. The player stations may be located in a different part of the gaming establishment or within a different gaming establishment than the off-site central server or controller. Thus, the WAN may include an off-site central server or controller and an off-site player station located within gaming establishments in the same geographic area, such as a city or state. The WAN gaming system may be substantially identical to the LAN gaming system described above, although the number of player stations in each system may vary relative to each other.

In one embodiment, as a benefit to one or more of the gaming venues (e.g., a casino), using the player tracking system, along with use of the GPS positioning, for identifying the movements of the players throughout the gaming venues, identifying cash, money, credits, and award amounts spent along with various trends (e.g., historical) for generating visual graphs while displaying showing top view of the gaming venue (e.g., looking down from above the gaming venue) to improve casino layouts and identify patterns an movements of all types of players.

In another embodiment, the data network is an internet or intranet. The operation of the player station can be viewed at the player station with at least one internet browser. Operation of the player station and accumulation of credits may be accomplished with only a connection to the central server or controller (the internet/intranet server) through a conventional phone or other data transmission line, digital subscriber line (DSL), T-I line, coaxial cable, fiber optic cable, WIFI, or other suitable connection. Players may access an internet game page from any location where an internet connection and computer, or other internet facilitator is available. The expansion in the number of computers and number and speed of internet connections in recent years increases opportunities for players to play from an ever-increasing number of remote

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sites. It should be appreciated that enhanced bandwidth of digital wireless communications may render such technology suitable for some or all communications, particularly if such communications are encrypted. Higher data transmission speeds may be useful for enhancing the sophistication and response of the display and interaction with the player.

In another embodiment, as described above, the gaming system is in communication with a central server or controller. The central server or controller may be any suitable server or computing device, which includes at least one processor and a memory or storage device. In alternative embodiments, the central server is a progressive controller or another player station in the gaming system. In one embodiment, the memory device stores different game programs and instructions, executable by a player station processor, to control the player station. Each executable game program represents a different game or type of game, which may be played on one or more of the player stations in the gaming system. Such different games may include the same or substantially the same game play with different pay tables. In different embodiments, the executable game program is for a primary game, a secondary game or both. In another embodiment, the game program may be executable as a secondary game to be played simultaneous with the play of a primary game (which may be downloaded to or fixed on the player station) or vice versa.

In this embodiment, one, all or a plurality of the player stations at least includes one or more display devices and/or one or more input devices for interaction with a player. A local processor, such as the above-described player station processor or a processor of a local server, is operable with the display device(s) and/or the input device(s) of one or more of the player stations. In operation, the central controller is operable to communicate one or more of the stored game programs to at least one local processor. In different embodiments, the stored game programs are communicated or delivered by embedding the communicated game program in a device or a component (e.g., a "chip" to be inserted in a player station), writing the game program on a disc or other media, downloading or streaming the game program over a dedicated data network, internet or a telephone line. After the stored game programs are communicated from the central server, the local processor executes the communicated program to facilitate play of the communicated program by a player through the display device(s) and/or input device(s) of the player station. That is, when a game program is communicated to a local processor, the local processor changes the game or type of game played at the player station or displayed on the display segment. Though the illustrated embodiments are described with the central controller determining a game result for the player and communicating that result to the central display 310 and one or more player stations, any other suitable game determining method may be employed in any embodiment of the present disclosure. In one embodiment, the central display 310 is associated with a central display 310 server. This central display 310 server determines the game outcome for the games played on each of the display segments. The central display 310 server communicates the game outcome to the central controller, which communicates the game outcome to one or more of the player stations.

In one embodiment, the central controller determines the award to provide to the player based on the game outcome. In another embodiment, the player stations determine the award and/or progress jackpot/value to provide to the players based on the game outcomes. In another embodiment, the central controller determines the game outcome displayed on the central display 310 and the player station determines any

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award and/or progress jackpot/value to provide to the player based on the game outcome. The player station determines both the game outcome and any award to provide to the player based on the game outcome. In another embodiment, the central controller determines part of the outcome and the player station determines part of the outcome. That is, both the central controller and the player station determine part of a player's outcome and/or award.

Further, in the gaming industry, many different manufacturers make gaming machines and player stations. The communication protocols on the player station may be hard-wired into the player station and each player station/gaming machine manufacturer may utilize a different proprietary communication protocol. A player station manufacturer may also produce host systems, in which case their player stations are compatible with their own host systems. However, in a heterogeneous gaming environment, player stations from different manufacturers, each with its own communication protocol, may be connected to host systems from other manufacturers, each with another communication protocol. Therefore, communication compatibility issues regarding the protocols used by the player stations in the system and protocols used by the host systems must be considered.

In another embodiment, player stations at one or more gaming sites may be networked to a central server in a progressive configuration, wherein a portion of each wager to initiate a base or primary game may be allocated to bonus or secondary event awards. In one embodiment, a host site computer is coupled to central servers at a variety of mutually remote gaming sites for providing a multi-site linked progressive automated gaming system. The host site computer may serve player stations distributed throughout a number of properties at different geographical locations including, for example, different locations within a city or different cities within a state. The host site computer may be maintained for the overall operation and control of the system. A host site computer may govern/control the entire progressive gaming system and may be the master for computing all progressive jackpots and values for each and every gaming device. All participating gaming sites report to, and receive information from, the host site computer. Each central server computer may be responsible for all data communication between the player station hardware and software and the host site computer. An individual player station may trigger a progressive win, for example through a game play event such as a symbol-driven trigger in the multi-component game. The central server or other central controller determines when a progressive win is triggered. The central controller and an individual player station may work in conjunction with each other to determine when a progressive win is triggered, for example through an individual player station meeting a predetermined requirement established by the central controller. The progressive award win may be triggered based on one or more game play events, such as a symbol-driven trigger. In other embodiments, the progressive award triggering event or qualifying condition may be by exceeding a certain amount of game play (such as number of games, number of credits, or amount of time), or reaching a specified number of points earned during game play. In another embodiment, a player station is randomly or apparently randomly selected to provide a player of that player station one or more progressive awards. In one such embodiment, the player station does not provide any apparent reasons to the player for winning a progressive award, wherein winning the progressive award is not triggered by an event in or based specifically on any of the plays of any primary game. That is, a player is provided a progressive award without any explanation or alternatively

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with simple explanations. In another embodiment, a player is provided a progressive award at least partially based on a game triggered or symbol triggered event, such as at least partially based on the play of a primary game. In one embodiment, one or more of the progressive awards are each funded via a side bet or side wager. In this embodiment, a player must place or wager a side bet to be eligible to win the progressive award associated with the side bet. In one embodiment, the player must place the maximum bet and the side bet to be eligible to win one of the progressive awards. In another embodiment, if the player places or wagers the required side bet, the player may wager at any credit amount during the primary game (i.e., the player need not place the maximum bet and the side bet to be eligible to win one of the progressive awards).

In one such embodiment, the greater the players' wager (in addition to the placed side bet), the greater the odds or probability that the player will win one of the progressive awards. It should be appreciated that one or more of the progressive awards may each be funded, at least in part, based on the wagers placed on the primary games of the gaming machines in the gaming system, via a gaming establishment or via any suitable manner. In another embodiment, one or more of the progressive awards are partially funded via a side-bet or side-wager, which the player may make (and which may be tracked via a side-bet meter). In one embodiment, one or more of the progressive awards are funded with only side-bets or side-wagers placed. In another embodiment, one or more of the progressive awards are funded based on player's wagers as described above as well as any side-bets or side-wagers placed. In one alternative embodiment, a minimum wager level is required for a player station to qualify to be selected to obtain one of the progressive awards. In one embodiment, this minimum wager level is the maximum wager level for the primary game in the gaming machine. In another embodiment, no minimum wager level is required for a gaming machine to qualify to be selected to obtain one of the progressive awards.

In another embodiment, players at a linked player stations in a gaming system participate in a group gaming environment. In one embodiment, players at linked player stations work in conjunction with one another, such as playing together as a team or group, to win one or more awards. In one such embodiment, any award won by the group is shared, either equally or based on any suitable criteria, amongst the different players of the group. In another embodiment, players linked player stations compete against one another for one or more awards. In one such embodiment, players at linked player stations participate in a gaming tournament for one or more awards. In another embodiment, players at linked player stations play for one or more awards wherein an outcome generated by one player station affects the outcomes generated by one or more linked player stations.

FIG. 4 is a schematic block diagram of a server-based gaming network 400 in accordance with an exemplary embodiment of the present invention. In the exemplary embodiment, network 400 includes a slot floor mix recommendation system 402 incorporated therein. In one embodiment, slot floor mix recommendation system 402 is a stand-alone system communicatively coupled to network 400. In various embodiments, slot floor mix recommendation system 402 is incorporated within various components of network 400. Network 400 provides methods and devices for managing one or more networked gaming establishments. Network 400 may be embodied in what is known as a server-based gaming network, sbX™ network. For example, in one embodiment, a host may be included in the network, such as

a server-based gaming network. For example, a gaming server (e.g., an sbX™ server) may be an example of the host. The gaming server (e.g., the sbX™ server) may be a set of servers running central applications and may attach as the host to EGMs via the gaming network. In one embodiment, a host, operating in the gaming network, may be a server (e.g., an sbX™ server) managing and controlling the gaming network (e.g., an sbX™ network). In one embodiment, the host, operating in the gaming network, may monitor the monetary activity of the EGM. The host may track any error conditions on the EGM. The host may configure the EGM such as to enable/disable games, download games, and configure game parameters (denomination, payback, etc.). For example, a gaming management solution (e.g., IGT® sbX™ gaming management solution) may be a server-based system to act as a repository for all game content that may be downloaded to EGMs giving each EGM instant access to the technology within the EGM's environment. The game software, random number generator and game logic are controlled by the EGM. This significantly increases configuration speed so that games may be adapted and seamlessly integrate analytics to the database in minutes. Game titles are accessed from the server using a floor manager (e.g., IGT Floor Manager®), running on the host, and allow operators to reconfigure their gaming floor almost instantly. In one embodiment, the floor manager, operating on the host, is a G2S-compliant game-to-system management solution that enables operators to remotely change the game mix on the casino floor. In one embodiment, the floor manager application provides operators with sophisticated and user-friendly visualization tools to analyze terminal (e.g., the EGM) and game performance in real-time. Using Quick Change functionality (QCF), the floor manager, running on the host server(s), enables operators to rapidly locate low performing games, select a new theme from the game library and download the new theme on the EGM in the gaming venue floor within minutes. The software displays a map of the casino floor and highlights EGMs color-coded to indicate performance. Operators can select individual terminals and receive analysis at terminal-, multi-game and single-game level, based on KPIs such as coin-in, actual win and occupancy of game. In one embodiment, the floor manager application is a gateway to a game-to-system library allowing operators to quickly schedule changes or switch between themes. Once selected, the game's configurations can be set including denomination, max bet and even volume and credit limits on the EGM. For example, new gaming industry-leading themes may be added to the game library every month and the floor manager application provides rapid deployment to the gaming floor to ensures an EGM will maintain high performance and continually provide the user with newer and advanced games to add to the users favorite and/or preferred games. In one embodiment, the quick recognition and eradication of low performing games and ability to respond to consumer requests on the floor, empowers a gaming venue to concentrate on player satisfaction and gaming experience.

In addition, with the sbX™ gaming management, as each EGM connected to the system is self-sufficient, if there is a malfunction or connectivity fault, information is backed up at the individual EGM for a predetermined period of time (e.g., two weeks), ensuring no data loss. Once the problem is resolved and the EGM is re-connected to a server, the backed-up data is instantly dropped into the database. Operators now have the ability to run their own choice of games on any interconnected terminal in the gaming venue. This allows management to switch between games at any time, delivering an unmatched level of flexibility and control over their gaming environment. Users are also able to select the games (e.g.,

a favorite and/or preferred EGM) and denominations they wish to play at the terminal. In one embodiment, the sbX™ gaming management system delivers a flexible and diversified approach to management and control of the casino floor, reconfiguring gaming machines at the appropriate time and schedule. For example, in one embodiment, all EGMs connected to the server are granted full access to themes held in a games depository and operators can reconfigure each terminal remotely from the workstation. A Games Library may be included and may contain over 300 gaming titles in a game-to-system depository. In one embodiment, the sbX™ gaming management application allows for games to be updated in minutes and with this simple configuration process in place, operators can place better focus on in-depth player statistics. Accurate information in real-time optimizes marketing strategies, to provide the ultimate gaming experience and ensure the floor remains dynamic. Instantaneous analysis and decisions may be implemented to adjust elements and increase user satisfaction and loyalty. This also enables a gaming venue to ensure users are able to play the latest content available. Various game themes can be changed, tested and reverted in different areas of the gaming venue with rapid execution. In one embodiment, the sbX™ application and its integrated modules provide for data analysis and also focus on player experience thereby allowing for the development of innovative marketing programs. For example, in one embodiment, certain banks of machines may be adapted to a featured game, linked to a proprietary progressive jackpot and then heavily promoted during certain times. Thus, these games may become a favorite and preferred EGM during a particular time. Following the promotion, the EGMs can quickly be restored to their original games. In one embodiment, the sbX™ system may be driven by IGT's Advanced Video Platform (AVP®) with the technology seamlessly integrated with all modules, permitting fast connectivity and advanced capabilities. In addition, GSA open protocols are used so that sbX™ applications are interoperable with third-party devices that have also adopted GSA open protocols.

Thus, in one embodiment, if a demand for a particular type of the EGM is in high demand (e.g., multiple users are selecting a favorite and/or preferred game on a particular EGM) but the supply of the favorite and/or preferred game on a particular EGM is low, the floor manager application provides the ability to quickly (e.g., within minutes) update and replace the EGM's having low performing games and/or non-preferred games on the EGM with the higher performing and/or favorite and preferred game on a particular EGM.

In one embodiment, network 400 permits the convenient provisioning of networked gaming machines and other devices relevant to casino operations. Game themes may be easily and conveniently added or changed, if desired. Related software, including but not limited to player tracking software and peripheral software may be downloaded to networked gaming machines, mobile gaming devices, thin clients and/or other devices, such as kiosks, networked gaming tables, player stations.

In some implementations, servers or other devices of a central system will determine game outcomes and/or provide other wager gaming functionality. In some such implementations, wagering games may be executed primarily on one or more devices of a central system, such as a server, a host computer, etc. For example, wager gaming determinations, such as interim and final game outcomes and bonuses, may be made by one or more servers or other networked devices. Player tracking functions, accounting functions and some display-related functions associated with wagering games

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may be performed, at least in part, by one or more devices of a casino network and/or of a central system.

In the exemplary embodiment, network **400** includes a casino computer room **404** and networked devices of a gaming establishment **406**. Gaming establishment **406** is configured for communication with a central system **408** via a gateway **410**. Other gaming establishments **412**, **414**, and **416** are also configured for communication with central system **408**.

Gaming establishment **406** includes multiple gaming machines **418**. Some of gaming machines **418** form a cluster or “bank” **420** of gaming machines **418**. Gaming machines **418** are configured for communication with one or more devices of casino computer room **404** or similar devices disposed elsewhere in gaming establishment **406**. Some of gaming machines **418** may be configured to read from, and/or write information to, a portable instrument such as but not limited to, a ticket and a player loyalty device. In one embodiment, gaming establishment **406** also includes a bank of networked gaming tables **422**. However, network **400** may be implemented in gaming establishments having any number of gaming machines, gaming tables, etc. It will be appreciated that many gaming establishments **406** include hundreds or even thousands of gaming machines **418**, gaming tables **422** and/or mobile devices **424**, not all of which are necessarily associated bank **420** and some of which may not be connected to network **400**. At least some of gaming machines **418** and/or mobile devices **424** may be “thin clients” that are configured to operate, at least in part, according to instructions from another device (such as a server).

Multiple storage devices **426**, sbX™ server **428**, License Manager **430**, servers **434**, **436**, **438**, and **440**, host device(s) **442**, and main network device **444** are disposed within computer room **404** of gaming establishment **406**. In practice, more or fewer devices may be used. Depending on the implementation, some such devices may reside elsewhere in gaming establishment **406**.

One or more of the devices in computer room **404** (or similar devices disposed elsewhere in gaming establishment **406** or in gaming establishment **412**, **414**, or **416**) may be configured to provide functionality relevant to embodiments of the present invention. For example, one or more of servers **434**, **436**, **438**, or **440** may be configured for communication with gaming machines **418** that are configured to provide a subset of themes for selection by a player. For example, one or more such servers may be configured to provide a selection of a subset of four themes from a large number of available themes.

Accordingly, in some embodiments at least some gaming establishments may be configured for communication with one another. In this example, gaming establishments **412**, **414**, and **416** are configured for communication with casino computer room **404**. Such a configuration may allow devices and/or operators in casino **406** to communicate with and/or control devices in other casinos. In some such implementations, a server (or another device) in computer room **404** may be configured to communicate with and/or control devices in gaming establishments **412**, **414**, and **416**. Conversely, devices and/or operators in another gaming establishment may communicate with and/or control devices in casino **406**.

Some of these servers in computer room **404** may be configured to perform tasks relating to accounting, player loyalty, bonusing/progressives, configuration of gaming machines, etc. A Radius server and/or a DHCP server may also be configured for communication with the gaming network. In various embodiments, sbX™ server **428** and the other servers shown in FIG. **4** include or are in communication with clus-

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tered CPUs, redundant storage devices, including backup storage devices, switches, etc. Such storage devices may include a redundant array of independent disks (RAID) array, back-up hard drives and/or tape drives, etc.

In various embodiments, many of these devices (including but not limited to License Manager **430**, servers **434**, **436**, **438**, and **440**, and main network device **444**) are mounted in a single rack with sbX™ server **428**. Accordingly, many or all such devices will sometimes be referenced in the aggregate as an “sbX™ server.” However, in alternative implementations, one or more of these devices is in communication with sbX™ server **428** and/or other devices of the network but located elsewhere. For example, some of the devices could be mounted in separate racks within computer room **404** or located elsewhere on the network. Moreover, in some implementations large volumes of data may be stored elsewhere, e.g., via a storage area network (“SAN”).

Computer room **404** may include one or more operator consoles or other host devices that are configured for communication with other devices within and outside of computer room **404**. Such host devices may be provided with software, hardware and/or firmware for implementing functions described herein. However, such host devices need not be located within computer room **404**. Wired host devices **442** (which are desktop and laptop computers in this example) and wireless devices **424** (which are PDAs in this example) may be located elsewhere in gaming establishment **406** or at a remote location.

Some embodiments include devices for implementing access control, security and/or other functions relating to the communication between different devices on the network. One or more devices in central system **408** may also be configured to perform, at least in part, tasks specific to embodiments of the present invention. For example, one or more servers **446**, storage devices and/or host devices **442** of central system **408** may be configured to implement the functions described in detail elsewhere herein. One or more servers **446**, storage devices **448** and/or host devices **442** of central system **408** may maintain player account information.

Some gaming networks **400** provide features for gaming tables that are similar to those provided for gaming machines, including but not limited to bonusing, player loyalty/player tracking, the use of cashless instruments, etc. Some configurations can provide automated, multi-player roulette, blackjack, baccarat, and other table games. The table games may be conducted by a dealer and/or by using some form of automation, which may include an automated roulette wheel, an electronic representation of a dealer, etc. In some such implementations, devices such as cameras **450**, radio frequency identification devices **452** and **454**, etc., may be used to identify and/or track patrons, playing cards, chips, etc. Some of gaming tables **422** may be configured for communication with individual player terminals (not shown), which may be configured to accept bets, present an electronic representation of a dealer, indicate game outcomes, etc.

Moreover, some such automated gaming tables **422** and/or associated player terminals may include, or may be configured for communication with, a device that includes a coin-out meter, a ticket reader, a card reader, a ticket printer, and/or other related features. In some implementations, one such device may provide such functionality to a plurality of automated gaming tables **422** and/or associated player terminals.

Gaming establishment **406** also includes networked kiosks **456**. Kiosks **456** may include card readers, ticket readers, printers, a user interface system, one or more displays, etc. Depending on the implementation, kiosks **456** may be used for various purposes, including but not limited to cashing out,

prize redemption, redeeming points from a player loyalty program, redeeming “cashless” indicia such as bonus tickets, smart cards, etc.

Kiosks **456** may be configured to read information from, and/or write information to, a portable instrument such as a smart card, a ticket, a card having a magnetic strip, etc. The corresponding gaming devices are preferably configured for communication with such kiosks **456** and vice versa. Accordingly, some such kiosks **456** may include a wireless interface that is configured for communication with mobile gaming devices **424**.

In the exemplary embodiment, each bank **420** has a corresponding switch **458**. Each switch **458** is configured for communication with one or more devices in computer room **404** via main network device **444**, which combines switching and routing functionality in this example. Although various communication protocols may be used, some preferred implementations use the Gaming Standards Association’s G2S Message Protocol. Some systems may use a gaming-industry-specific transport layer called CASH™, which offers additional functionality and security.

Gaming establishment **406** may also include an RFID network, implemented in part by RFID switches **460** and multiple RFID readers **452**. An RFID network may be used, for example, to track objects such as mobile gaming devices **424**, which include RFID tags **454**, patrons, chips, player loyalty devices, etc., in the vicinity of gaming establishment **406**.

Various alternative network topologies can be used to implement different aspects of the invention and/or to accommodate varying numbers of networked devices. For example, some gaming establishments may include cameras **450** for implementing advanced player tracking, player navigation or other functionality. Gaming establishments with large numbers of gaming machines **418** may require multiple instances of some network devices (e.g., of main network device **444**, which combines switching and routing functionality in this example) and/or the inclusion of other network devices not shown in FIG. **4**. Some embodiments may include one or more middleware servers disposed between the kiosks **456**, RFID switches **460** and/or bank switches **458** and one or more devices (e.g., a corresponding server, router or other network device) in computer room **404**. Such middleware servers can provide various useful functions, including but not limited to the filtering and/or aggregation of data received from switches, from individual gaming machines and from other devices. Some implementations of the invention include load-balancing methods and devices for otherwise managing network traffic.

In one embodiment, the use of the above system in association with electronic gaming machines eliminates the necessity of having the EGM’s dedicated to a particular amount of wager. By use of the cashless wagering system via the sbX™ server **428**, central system **408**, servers **446**, the main network device **444**, the storage devices and/or the host devices **442** of central system **408**, it is possible to change the wager limits of any or all of the individual electronic gaming machines. Thus, the minimum wager of the EGM can be changed at any time. It would also be possible to allow the player to select the wager limit.

This permits the casino operators to increase the usefulness of the EGMs to the gaming venue. In one embodiment, players playing EGMs of different wagering limits may elect to participate in common jackpot. Another feature of the cashless wagering system that is advantageous to a gaming venue is the tracking of the financial amount of use of the EGM by a particular player. For example, if the amount of dollars that are being played by a player is desired to be tracked, the

player inserts the financial transaction device, which in one embodiment is in the form of a card, which has a magnetic code on it, into the EGM, which may serve to identify the player and an associated financial account of a financial institution. The EGM would then store is the amount of play, time and/or money, and/or the individual player. The CPU would stop tracking the individual player when a cash out slip was generated. This system provides a complete accounting of customer accounts. Moreover, once a player has inserted the financial transaction device into an EGM, that player can then be tracked by the insertion of any financial transaction device generated, and/or previously generated, by the EGM, gaming venue, and/or financial institution for that player. The player would not have to insert the identification card into an EGM as long as the player had the financial transaction device. For example, a financial institution and/or gaming venue may provide the player with a financial transaction device (e.g., a credit card like device) which may have secured data associated with the player, at least one financial account, and/or the financial institution. Using the sbX™ server **428**, central system **408**, servers **446**, the main network device **444**, the storage devices and/or the host devices **442** of central system **408**, the financial transaction device secured information is verified, activated, provided, and/or tracked while being used and may then be used to deposit any financial amount into an ATM. It should be noted that various types and forms of financial transaction devices may be used at any given time. For example, in one embodiment, a player may have been previously provided a card like device (e.g., a players card) having a players profile and financial institution account information loaded and stored onto the financial transaction device. The player then uses this credit card like device for gaming and inserts it into the EGM to commence a gaming operation. At the time of performing the cash out operations, the player may elect to receive a printed cash out slip, an illustrated below in FIG. **5**, having at least an account identifier linking the financial transaction device (e.g., the printed ticket) to at least one financial account of at least one financial institution associated which information was obtained via the service window application and/or provided by the EGM reading the credit card like device. At this point the player may use the printed cash out slip for depositing the financial amount into at least one financial account, performing a cashless wagering operation in the EGM, and/or using the financial transaction device for payment of goods and services by gaming and non-gaming venues, particularly using the information window (e.g., a service window) of the EGM, which may be operated by and/or in communication with an sbX™ server **428**, central system **408**, servers **446**, a main network device **444**, storage devices and/or host devices **442** of central system **408** may be configured to implement the functions described in detail elsewhere herein) and/or via the external application.

In one embodiment, any wireless communication, between the ATM, EGM, and/or financial institution may go directly to the processing unit on a particular and identified EGM being in communication with and/or controlled by a sbX™ server **428**, central system **408**, servers **446**, a main network device **444**, storage devices and/or host devices **442** of central system **408** may be configured to implement the functions described in detail elsewhere herein. The EGM may be configured with a hardware device (e.g., those described in FIG. **4**) that communicates with the PMD. The EGM, using a service window application, may contain a device that communicates with a bill acceptor or printer to simulate bills and tickets. The EGM may have a device (software and/or hardware) that communicates with a back end host that ultimately uses SAS or G2S

to move the money to and from the particular and identified EGM. This configuration allows all of EGMs to be retrofitted for mobile payments. Moreover, the sbX™ server **428**, central system **408**, servers **446**, a main network device **444**, storage devices and/or host devices **442** of central system **408** may be configured to implement the functions for providing the financial transaction device and also for readying and/or allowing the financial transaction device for use for depositing the financial amount into the at least one financial account, cashless wagering in the EGM, and/or payment of the goods and the services. The financial transaction device produced by the sbX™ server **428**, central system **408**, servers **446**, the main network device **444**, the storage devices and/or the host devices **442** of central system **408** may be configured to implement and assist with the any and/or all functions used for depositing the financial amount into at least one financial account of the at least one financial institution associated with the gaming network by either the EGM and/or the ATM, performing a cashless wagering operation in the EGM, and/or purchasing the goods and services.

In one embodiment, the player may cash out from the EGM to the financial transaction device and then immediately deposit the financial amount into the ATM, performing additional cashless gaming operations, and/or purchase goods and/or services from gaming and/or non-gaming venues. The service window application available on the EGM may assist with performing each of these functions. For example, employing the service window application in communication with the sbX™ server **428**, the central system **408**, servers **446**, the main network device **444**, storage devices and/or host devices **442** of central system **408**, the player may cash out from the EGM to the financial transaction device and then immediately deposit the financial amount into the ATM, performing additional cashless gaming operations, and/or purchase goods and/or services from gaming and/or non-gaming venues. In one embodiment, each EGM may have specific and unique identifiers, which may be displayed in the service window application, and this identifying information (e.g., account number associated with the financial institution) of the EGM, the players profile, and/or the financial transaction device may be included in the financial transaction device provided using the sbX™ server **428**, the central system **408**, servers **446**, the main network device **444**, and/or host devices **442** of central system **408** described herein. In one embodiment, each EGM may have specific and unique identifiers, and this identifying information of the EGM may be included in on the financial transaction device provided via the sbX™ server **428**, the central system **408**, servers **446**, the main network device **444**, and/or host devices **442** of central system **408** described herein.

In one embodiment, prior to performing a gaming operation, a request for approval may be displayed to the player requesting data (e.g., player information, account information, financial institution data, and the like) that is necessary for depositing the financial amount into the ATM, and the data intended to be included on the financial transaction device may be verified and/or validated by the player, the gaming venue, and/or financial institution. This information is then securely stored and saved and retrieved upon demand and allows the player for greater access to the financial amounts at any particular time.

FIG. 5 is a diagrammatic block diagram of the system **500** in which aspects of the present invention may be realized. The system itself is referred to as a Coinless Gaming System and is referred to generally by reference **510**. The Coinless Gaming System **500** is controlled by a host central processing unit (CPU) **502** consisting of a stand alone computer having all of

the conventional attributes of a general purpose computer. In one embodiment a status brand fault tolerant computer is used. The CPU **502** is connected to a series of gaming apparatus, such as electronic gaming machines (EGM)/slot machine **532** (e.g., **532a-b**). The play of the EGM **532** is controlled by internal game software **508** with preset parameters for the play of the game. In one embodiment the desired game to be played is selected from a touch screen operable menu (shown in FIGS. **9-10**) whereby the player can select the particular game that the player wishes to play, as well as other options, such as the amount of the wager. For example, the menu may provide the player with the options of playing blackjack, conventional slots, poker, keno, scratchers, electronic gaming options, horse racing, roulette, or any other game available on software. The player can also select the amount of the wager, for example in units of 25 cents, \$1.00 or any other amount permitted by the menu. The CPU **502** controls the various menu driven options, such as game selection and amount of the wager for the game. The slot machine **200** includes a first input means in the form of a paper currency reader **522**. The paper currency reader **522** provides a signal to the CPU **502** indicating that it is valid currency and value of the currency. The CPU **502** then authorizes the appropriate credit to the gaming apparatus **532**. While in one embodiment the paper currency reader **522** will be able to read several different paper currency that recognize a variety of international currencies in addition to United States paper currency. The CPU **502** can have the current exchange rates for purposes of determining the credit available to the player. The EGM **532** has a second input means in the form of a bar code reader **514** (the bar code reader may also be a financial transaction device reader as described herein, such as a magnetic strip reader). Thus, the operation of financial transaction device readers **514** may be a bar code reader and the like. While in one embodiment the financial transaction device, having a bar code, a magnetic strip, an financial account identifier (e.g., a numerical value), a variety types of holograms for security and/or identification, and/or player identification, for example, inserted in the form of a permanent storage means, such as on a credit card/debit card like device, paper cash out slip, such as shown in FIG. **6**, or free play coupon shown in FIG. **7**, or Jackpot pay out ticket shown in FIG. **8**, each of which has a bar code on the ticket for reading by the financial transaction device readers **514** (e.g., bar code reader), it is recognized that other forms of codes and the account identifier linking the financial card device to the financial institution may be used in with the bar code, and may also include a coded magnetic strip on plastic cards. While in most cases the free play coupons will be in the form of a monetary value, preprinted free play coupons not having money values associated with them, but other forms of play are possible. For example, the coupon may be used to permit the player to compete in a contest for the best hand in a casino wide poker contest, or other promotional purposes. In one embodiment, the paper currency reader **512** and the financial transaction device readers **514** are located within the housing of the EGM **532** so that the financial transaction devices, as described herein such as free play coupons, cards, cash out slips, and/or paper currency are all entered within a single slot and stored on top of each other in a single lock box that would be removable from the EGM **532** by authorized personnel. However, it is also possible to have the paper currency deposited in a separate slot from the free play coupons or cash out slips and stored separately.

The EGM **532** also includes a financial transaction device printer **516** and/or device for generating/creating the financial transaction device, and is show in FIGS. **6**, **7**, and **8**, by way of

example only, as a bar code printer **516** for printing financial transaction devices **600** of FIG. **6**, **700** of FIG. **7**, and/or **800** of FIG. **8**, such as cash out slips and/or card like devices having bar codes (and/or magnetic strips) see **610** of FIG. **6** (similar bar codes and/or magnetic strips are listed on FIG. **7** and FIG. **8** but are not number for sake of brevity) on a permanent storage medium, such as paper, which is stored within the housing. In addition to the bar code, the magnetic strip, holograms, player identification, financial account identifier linking the financial transaction device **600** of FIG. **6**, **700** of FIG. **7**, and/or **800** of FIG. **8** to a financial account (e.g., see codes "012345" on FIG. **6 600**, "212345" on FIG. **7 700**, and/or "312345" on FIG. **8 800**), the financial transaction device (e.g., a cash out slip, and/or card like device, and the like) **600** of FIG. **6**, **700** of FIG. **7**, and/or **800** of FIG. **8** (herein after labeled collectively as **600**, **700**, and **800**) may also contain other information such as the date, time, match, and/or location (all shown collectively as **624** of FIG. **6** and may be included on FIGS. **7-8**) of the card and/or print out of the cash out slip **600**, **700**, and **800**. It should be noted that the financial transaction device creator/printer **524** may also be able to create and/or generate a new card like device or paper like device with a bar code, a magnetic strip, an account identifier for linking the financial transaction device to a financial account of a financial institution for depositing the financial amount into an ATM, perform additional cashless wagering, and/or purchasing goods and services. For example, a simple roll of preprinted cash out slips should be sufficient to generate from 800 to 1600 cash out slips. A sensor can signal the CPU **502** when only ten (10%) percent, or some other amount, of the coupons or card like devices are remaining so that the paper can be changed and/or the card like devices may be replenished. The printer **208** prints a bar code as directed by the CPU **502** using the sbX™ server **428** (see FIG. **4**), the central system **408** (see FIG. **4**), servers **446** (see FIG. **4**), the main network device **444** (see FIG. **4**), and/or host devices **442** (see FIG. **4**) of central system **408** described above (see FIG. **4**).

The financial transaction device producer/printer **516** prints a bar code **610** of FIG. **6** on the financial transaction device (e.g., cash out slips) **600**, **700**, and **800** responsive to the instructions from the CPU **502** as directed by the CPU **502** using sbX™ server **428** (see FIG. **4**), the central system **408** (see FIG. **4**), servers **446** (see FIG. **4**), the main network device **444** (see FIG. **4**), and/or host devices **442** (see FIG. **4**) of central system **408** described above (see FIG. **4**). The CPU **502** generates the bar code **610** to be printed. The bar code **610** represents the monetary value **620** of FIG. **6** (similar numeric monetary value amounts **620** may be included on FIGS. **7-8** but numbered on FIG. **6** for sake of brevity) of the value of the credit stored in the particular EGM **532** on the cash out slips **220**, along with a randomly generated number in order to permit the CPU **500** to verify the validity and unique identification of the financial transaction device (e.g., a card and/or cash out slip and the like) **600**, **700**, **800** at a later time. This is necessary since the financial transaction device (e.g., bar code card/cash out slip) **600**, **700**, **800** is capable of being inserted as an input into the financial transaction device reader (e.g., magnetic strip/bar code reader) **514**. Upon insertion of the financial transaction device (e.g., a card and/or cash out slip and the like) **600**, **700**, **800** into the financial transaction device reader (e.g., magnetic strip/bar code reader) **514**, the financial transaction device reader (e.g., magnetic strip/bar code reader) **514** transmits a signal to the CPU **502** corresponding to the bar code, magnetic strip, account identifier for a financial account, and/or player identification information, and the CPU **502** compares the bar code, the magnetic

strip, the account identifier for a financial account, and/or player identification information on the particular financial transaction device **600**, **700**, and **800** (e.g., card/cash out ticket) with those stored in its memory which contains the value of the financial transaction device **600**, **700**, and **800** (card/cash out slip), the unique identification, and its status.

In an alternative embodiment of the present invention, when paper currency and/or the financial transaction device (e.g., a cash out slip or a free play coupon) **600**, **700**, and/or **800** is inserted as an input into a EGM **532**, a status indicator in the form of a visual display of the amount of the value of the card/ticket, currency or free play coupon will appear on the screen **900** and **1000**, as shown in FIGS. **9-10**, with a query to the player to verify that this is the right amount. In one embodiment, such display may be displayed using the service window application using the sbX™ server **428** (see FIG. **4**), the central system **408** (see FIG. **4**), servers **446** (see FIG. **4**), the main network device **444** (see FIG. **4**), and/or host devices **442** (see FIG. **4**) of central system **408** described above (see FIG. **4**). If it is not the right amount or there is some other error, then the player would be directed to call an attendant.

A third input to the CPU **502** or central system **408** (See FIG. **4**) can be a player identification code reader **510** which is capable of reading the financial transaction device **600**, **700**, and/or **800** (e.g., a debit card, credit card, an identification card, a cash out slip, a ticket, and the like) with specially encoded identification information on the financial transaction device **600**, **700**, and/or **800**, such as one having a magnetic strip, for identifying the player using the EGM **532**. This the financial transaction device **600**, **700**, and/or **800** is intended to permit the CPU **502** to keep track of the player and the amount of time and/or money played by the identified player. The financial transaction device **600**, **700**, and/or **800** may also provide the player with a credit. The identification card reader **510** input can also be a key pad which the player would use to enter a number or some other means of identification.

Also associated with the CPU **502** are one or more change stations **528a-n** or convenient ATM **530** (**530a-n**) devices, which instead of dispensing cash, generate and/or are able to receive for deposit the financial transaction device **600**, **700**, and/or **800** usable with the electronic gaming machines **532**. In one embodiment, the change station **300** consists of a second bar code reader **304** that accepts the financial transaction device **600**, **700**, and/or **800**. The validity of the financial transaction device **600**, **700**, and/or **800** is verified by the CPU **502**. Other security devices, such as holograms and the like that can be visually inspected to provide further security may be employed as well.

In an alternative embodiment, the change station can be more automated. The change station **528** in an alternative embodiment consists of a second paper currency reader **522**, a second financial transaction device reader (e.g., bar code reader) **524**, and a second financial transaction device creator/printer (e.g., bar code printer) **526** for creating a card and/or printing bar codes, magnetic strips, holograms, financial account identifiers linking the financial transaction device to a financial account, player identification, and/or other security information on a permanent storage medium. The second currency reader **522**, second financial transaction device reader (e.g., bar code reader) **524**, and second financial transaction device creator/printer (e.g., bar code printer) **526** are the same as used in the EGM **532**. The change station **528** also includes a currency dispenser **536** so that when a financial transaction device **600**, **700**, and/or **800**, (e.g., a cash out slip) is inserted into the financial transaction device reader **514**, **524**, then paper currency and coins can be dispensed directly

to the user. In an alternative embodiment, a coin receiver is capable of accepting coins from a player in order to create and/or update a financial transaction device, print cash out slips having a bar code, in the same manner that the EGM 532 would create and/or update a financial transaction device and/or print out cash out slips, that could be used with the electronic gaming machines 532.

As is the case with the EGM 532, in the event that a financial transaction device 600, 700, and/or 800 is inserted into the financial transaction device reader 514, 524, the CPU 502 (or embodiments described in FIG. 4) will validate the financial transaction device 600, 700, and/or 800 by making sure that it had not already been paid or otherwise valid.

The CPU 502 is fed signals generated, by the Universal Interface Board (UIB) 506 which acts as the interface between the EGM 532 and the CPU 502, and/or generated by the sbX™ server 428 (see FIG. 4), the central system 408 (see FIG. 4), servers 446 (see FIG. 4), the main network device 444 (see FIG. 4), and/or host devices 442 (see FIG. 4) of central system 408 described above (see FIG. 4).

The UIB 506 and/or the sbX™ server 428, (see FIG. 4) may work independently and/or in conjunction to collect all of the EGM data, organizes and formats it, and then transmits the organized data to the CPU 502 and/or the central system 408 (see FIG. 4), servers 446 (see FIG. 4), the main network device 444 (see FIG. 4), and/or host devices 442 (see FIG. 4) of central system 408 described above (see FIG. 4), and also acts as a controller for the operation and functions of the central system 408 (see FIG. 4), servers 446 (see FIG. 4), the main network device 444 (see FIG. 4), and/or host devices 442 (see FIG. 4) of central system 408 described above (see FIG. 4). The UIB 506 is capable of being changed by the CPU 502 and/or the sbX™ server 428 (see FIG. 4), the central system 408 (see FIG. 4), servers 446 (see FIG. 4), the main network device 444 (see FIG. 4), and/or host devices 442 (see FIG. 4) of central system 408 described above (see FIG. 4), to alter any of its functions. While in one embodiment, printed bar codes are used as the encoding means, it is also possible to use other coding means, such as holograms, magnetic codes on magnetic strips on plastic cards. The cards would be treated the same as cash out slips, but would require magnetic code readers and magnetic code generators rather than bar code readers and bar code printers.

FIG. 11 is a flow chart illustrating an exemplary method 1100 for facilitating use of a financial transaction device in which aspects of the present invention may be realized. The method 1100 begins (step 1102) by providing (e.g., generating, creating, updating, printing, and/or activating) a financial transaction device (step 1104). The method 1100 uses the financial transaction device for depositing a financial amount on the financial transaction device into an automated teller machine (ATM), perform cashless wagering operations in an electronic gaming machine (EGM), and/or purchasing goods and services (step 1106). The method 1100 ends (step 1108).

FIG. 12 is a flow chart illustrating an alternative exemplary method 1200 for facilitating use of a financial transaction device in which aspects of the present invention may be realized. The method 1200 begins (step 1202) by providing (e.g., generating, creating, updating, printing, and/or activating) a financial transaction device (step 1204). The method 1200 loads and/or stores on the financial transaction device a financial amount of monetary credit available for play on the EGM (e.g., provides an amount of gaming credit for playing on an EGM) (step 1206). The method 1200 recognizes and validates paper currency, coin currency, and/or previously loaded and stored monetary credit for being the current financial amount loaded and stored onto the financial card device

(step 1208). The method 1200 represents the financial amount on the financial transaction device as the financial amount of the paper currency, the coin currency, and/or the previously loaded and stored monetary credit that is recognized and validated (step 1210). The method 1200 retains a permanent storage record of the financial amount on the financial transaction device (step 1212). The method 1200 reads the financial amount on the financial transaction device using a bar code, a hologram, a player identification (ID), a magnetic strip, and/or an account identifier linking the financial transaction device to at least one financial account of the financial institution (e.g., a financial institution associated with the gaming venue and/or an automated teller machine) (step 1214). The method 1200 performs a cashless wagering operation using the financial transaction device used for gaming in the EGM (step 1216). The method 1200 performs a cash out operation on the EGM and provides/updates the financial transaction device associated with EGM and information relating to the cash out operation (step 1218). The method 1200 uses the financial transaction device for depositing the financial amount into an ATM, performing an additional cashless wagering operation using the financial transaction device in an EGM, and/or purchasing goods and services offered by either a gaming venue and/or a non-gaming venue (step 1220). The method 1200 ends (step 1222).

Turning now to FIG. 13, a block diagram illustrating a gaming system 1300 that contains multiple EGMs in which aspects of the present invention may be realized is depicted. Players 1320, operators and regulators (collectively illustrated in FIG. 13 as 'player 1') have personal mobile devices (PMD) 1314 that are used for various operations on the casino network 1318 and the EGMs 1302 (illustrated in FIG. 13 as 1302A-D). Specifically the PMDs 1314 allow the players 1320 to communicate with the EGM 1302 at which they are seated to access game or player account features. The players 1320 can also use their PMDs 1314 to access the network 1318 of the casino or the internet 1308, using, for example, the wireless access point 1312 for the internet connection 1310. The players 1320 may use the web browser on their device 1314 or applications installed on their device 1314 that access the networks 1318, 1308.

As illustrated in FIG. 13, the player 1320 is using EGM1 1302D that is at a bank of EGMs 1302. The player 1320 has a PMD 1314 that has wireless capabilities (such as 802.11 or Bluetooth) and can connect and communicate with the Wireless Access Point (WAP) 1312. In one embodiment, the WAP 1312 is a commodity, off the shelf device. In one embodiment, the player 1320 has a player tracking card or player account at the gaming venue. The server/host 1304 shown is part of the casino service based system and/or host system. In one embodiment, the activity of the personal mobile device 1314 is monitored by an activity monitory 1306 that is in communication with the server/host 1304. In one embodiment, the PMD 1314 may be directly paired with at least one of the EGMs 1302 using the pairing connection 1316. An ATM machine (as depicted in FIG. 5 530) may be included in the gaming system 1300 and the ATM machine (as depicted in FIG. 5 530) may be directly paired to the EGMs 1302 via the EGM gaming network 1318, the server/host 1304, and/or the personal mobile device 1314.

FIG. 14 is a block diagram illustrating a service screen window 1400 including a game screen for play on an electronic gaming machine (EGM) which aspects of the present invention may be realized. In one embodiment, the service window 1400, as described above, is an application on the EGM that allows the player to order drinks, buy show tickets, buy buffet ticket, and/or access the player's player account,

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and the like. The service window may be customized based on data that is sampled, harvested, and/or collected while using the EGM. The service window may offer the player various goods/services (e.g., shopping opportunities). In one embodiment, the service window 1400 may provide for ordering beverages, providing property information, shopping, ordering goods/services, bonus games options, my rewards section, comp balance option, a cash out option for using the financial transaction device, and the like.

FIG. 15 are a block diagrams illustrating an exemplary service screen application 1500 and an external application displaying various electronic gaming machines (EGMs) options on a personal mobile device (PMD) 1504 and/or an electronic gaming machine (EGM) 1506 for use with the financial transaction device in which aspects of the present invention may be realized. The player may use an application on the PMD 1504 (e.g., a mobile digital device, digital media extender, a smart phone, an electronic tablet, a player mobile device 'PMD', a computer, and the like) that also accesses the gaming network, and the EGM 1506 and provides opportunities for customization. For example, the player may be playing an online game with the PMD 1504 and/or playing the EGM 1506 using the PMD 1504. The host may identify this game traffic and customize the EGM 1506 to match the style of online game. Using the service window as described herein, various options are provided for buying drinks, ordering tickets for shows or buffets etc. In one embodiment, the service window application is displayed on the EGM 1504 and/or PMD 1504 showing a game on the right service screen window on the left side. In one embodiment, the service window displays "Thank You for Playing! Would you like to cash out from the EGM?" The service window application provides options for the player to select "YES" and/or "NO." In one embodiment, the service window displays and asks the user "would you like to cash out your winnings/game credits from the EGM onto a ticket and/or players card for making a deposit into an ATM?" The service window application provides options for the player to select "YES" and/or "NO." In one embodiment, the service window displays and asks the user "would you like to be able to purchase goods/services with your players card and/or cash out ticket?" The service window application provides options for the player to select "YES" and/or "NO." In one embodiment, the financial transaction device may be the players card and/or the cash out ticket. It should be noted that the messages, menus, goods and services, may be customized and provided to the player.

FIG. 16 are block diagrams illustrating an alternative exemplary service screen application 1600 and an external application displaying various electronic gaming machines (EGMs) options on a personal mobile device (PMD) 1604 and/or an electronic gaming machine (EGM) 1602 for use with the financial transaction device in which aspects of the present invention may be realized. In one embodiment, the service window application is displayed on the EGM 1602 showing a game on the right service screen window on the left side and/or the service window application is displayed on the PMD 1604. In one embodiment, the service window displays "are you a new User?" The service window application provides options for the player to select "YES" and/or "NO." In one embodiment, the service window displays and asks the user "would you like to be able to use a financial transaction device for depositing winnings/financial amounts into an ATM, perform additional cashless game wagering, and/or purchase goods/services?" The service window application provides options for the player to select "YES" and/or "NO." In one embodiment, the service window displays and asks the user "please enter the following secured data/information:

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Name: (the player enters the name for example "John Doe"), date of birth: (the player enters for example "1/2/1960"), and Financial Acct data: (the player enters the a number displayed as an example as "XXXXXXX"). In one embodiment, the financial transaction device may be the players card and/or the cash out ticket. In one embodiment, the financial transaction device may be the players card and/or the cash out ticket. It should be noted that the messages, menus, goods and services, may be customized and provided to the player.

Therefore, based upon the embodiments describe herein, in one embodiment, the present invention provides various methods, systems, and computer program products for facilitating use of a financial transaction device in a cashless wagering system in a gaming system/venue. In one embodiment, by way of example only, the financial transaction device, has at least an account identifier linking the financial transaction device to at least one financial account of at least one financial institution associated with the gaming network, is provided (e.g., provided by an electronic gaming machine (EGM), a financial institution, and/or a gaming and/or non-gaming venue) for depositing the financial amount into at least one financial account, performing a cashless wagering operation in the EGM, and/or using the financial transaction device for payment of goods and services by gaming and non-gaming venues. Providing the financial card readies and/or allows the financial transaction device for use for depositing the financial amount into the at least one financial account, cashless wagering in the EGM, and/or payment of the goods and the services. The financial transaction device is used for depositing the financial amount into at least one financial account of the at least one financial institution associated with the gaming network by either the EGM and/or the ATM, performing a cashless wagering operation in the EGM, and/or purchasing the goods and services. The financial transaction device is at least one of a ticket-in/ticket-out (TITO) system, a pre-paid card device, a players club card, an identification card, a financial account deposit device, and the financial transaction device has at least one of a bar code, a magnetic strip, the financial amount, and the account identifier, and is provided by at least one of the EGM, the at least one financial institution, the gaming venue, and a non-gaming venue.

In one embodiment, the present invention loads and stores on the financial transaction device the financial amount of credit available for play on the EGM. The financial amount of the credit being a financial amount dynamically loaded onto the financial transaction device via the at least one financial institution, a credit determined by at least one of a plurality of outcomes of the EGM, and/or an amount inputted into the EGM. In one embodiment, the present invention recognizes and validates paper currency and coin currency for being the financial amount loaded and stored onto the financial card device. In one embodiment, the present invention retains a permanent storage record of the financial amount on the financial transaction device, reads the financial amount on the financial transaction device using one of the bar code, the magnetic strip, and the account identifier linking the financial transaction card to the at least one financial account of the financial institution, and represents the financial amount on the financial transaction device as the financial amount of the paper currency and the coin currency that is recognized and validated.

In one embodiment, the present invention uses the financial transaction device for depositing the financial amount into at least one financial account. In one embodiment, the present invention uses the financial transaction device for depositing the financial amount into at least one financial account of the

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at least one financial institution associated with the gaming network using the ATM. In one embodiment, the financial institution may be a non-gaming financial institution having an association with a gaming venue.

In one embodiment, the present invention provides a solution for depositing the financial amount into at least one financial account using the financial transaction device using the ATM upon performing a cashing out operation from the EGM.

In one embodiment, the present invention charges a fee associated with the use of the financial transaction card, and/or charges a fee associated with the use of the financial transaction card to be allocated based on a variety of allocation protocols between the financial institution and a gaming venue. In one embodiment, the present invention performs a cashless wagering operation using the financial transaction device in the EGM. In one embodiment, the present invention allows for purchasing the goods and services using the financial transaction device.

In one embodiment, the present invention provides a solution for reading the financial amount on the financial transaction card using a financial transaction device reader associated with one of the gaming network and a non-gaming network. In one embodiment, the present invention provides a solution for using a host in the gaming network for acting as a proxy for communicating between the financial transaction device and the financial institution associated with the ATM. In one embodiment, the present invention provides a solution for directly pairing the EGM and the ATM using a service based application system (see FIG. 4) in the gaming network. In one embodiment, the financial amount on the financial transaction device is dynamically deposited into the ATM and dynamically transferred using the service based application system into the at least one financial account via the ATM. In one embodiment, the service window application allows for dynamically depositing the financial amount on the financial transaction device from the EGM into the ATM. In one embodiment, the EGM provides a financial transaction device for depositing the financial amount on the financial transaction device into the ATM.

As will be appreciated by one skilled in the art, aspects of the present invention may be embodied as a system, method or computer program product. Accordingly, aspects of the present invention may take the form of an entirely hardware embodiment, an entirely software embodiment (including firmware, resident software, micro-code, etc.) or an embodiment combining software and hardware aspects that may all generally be referred to herein as a "circuit," "module" or "system." Furthermore, aspects of the present invention may take the form of a computer program product embodied in one or more computer readable medium(s) having computer readable program code embodied thereon.

Any combination of one or more computer readable medium(s) may be utilized. The computer readable medium may be a computer readable signal medium or a computer readable storage medium. A computer readable storage medium may be, for example, but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, or device, or any suitable combination of the foregoing. More specific examples (a non-exhaustive list) of the computer readable storage medium would include the following: an electrical connection having one or more wires, a portable computer diskette, a hard disk, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or Flash memory), an optical fiber, a portable compact disc read-only memory (CD-ROM), an optical storage device, a magnetic

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storage device, or any suitable combination of the foregoing. In the context of this document, a computer readable storage medium may be any tangible medium that may contain, or store a program for use by or in connection with an instruction execution system, apparatus, or device.

Program code embodied on a computer readable medium may be transmitted using any appropriate medium, including but not limited to wireless, wired, optical fiber cable, RF, etc., or any suitable combination of the foregoing. Computer program code for carrying out operations for aspects of the present invention may be written in any combination of one or more programming languages, including an object oriented programming language such as Java, Smalltalk, C++ or the like and conventional procedural programming languages, such as the "C" programming language or similar programming languages. The program code may execute entirely on the user's computer, partly on the user's computer, as a stand-alone software package, partly on the user's computer and partly on a remote computer or entirely on the remote computer or server. In the latter scenario, the remote computer may be connected to the user's computer through any type of network, including a local area network (LAN) or a wide area network (WAN), or the connection may be made to an external computer (for example, through the internet using an internet Service Provider).

Aspects of the present invention have been described above with reference to flowchart illustrations and/or block diagrams of methods, apparatus (systems) and computer program products according to embodiments of the invention. It will be understood that each block of the flowchart illustrations and/or block diagrams, and combinations of blocks in the flowchart illustrations and/or block diagrams, may be implemented by computer program instructions. These computer program instructions may be provided to a processor of a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which execute via the processor of the computer or other programmable data processing apparatus, create means for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

These computer program instructions may also be stored in a computer readable medium that may direct a computer, other programmable data processing apparatus, or other devices to function in a particular manner, such that the instructions stored in the computer readable medium produce an article of manufacture including instructions which implement the function/act specified in the flowchart and/or block diagram block or blocks. The computer program instructions may also be loaded onto a computer, other programmable data processing apparatus, or other devices to cause a series of operational steps to be performed on the computer, other programmable apparatus or other devices to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide processes for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

The flowchart and block diagrams in the above figures illustrate the architecture, functionality, and operation of possible implementations of systems, methods and computer program products according to various embodiments of the present invention. In this regard, each block in the flowchart or block diagrams may represent a module, segment, or portion of code, which comprises one or more executable instructions for implementing the specified logical function(s). It should also be noted that, in some alternative implementations, the functions noted in the block may occur

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out of the order noted in the figures. For example, two blocks shown in succession may, in fact, be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved. It will also be noted that each block of the block diagrams and/or flowchart illustration, and combinations of blocks in the block diagrams and/or flowchart illustration, may be implemented by special purpose hardware-based systems that perform the specified functions or acts, or combinations of special purpose hardware and computer instructions.

What is claimed is:

1. A method for facilitating use of a financial transaction device of a cashless wagering system in a gaming system having at least one processor device, the method comprising:

providing the financial transaction device, having at least an account identifier linking the financial transaction device to at least one financial account of at least one financial institution associated with the gaming network, for one of depositing a financial amount into the at least one financial account, cashless wagering in an electronic gaming machine (EGM) having a payment acceptor for funding a bet associated with the financial transaction device and, and use by a plurality of gaming and non-gaming venues for payment of goods and services, wherein providing the financial transaction device readies the financial transaction device for one of depositing the financial amount into the at least one financial account, cashless wagering in the EGM, and payment of the goods and the services;

loading and storing on the financial transaction device the financial amount of credit available for play on the EGM, wherein the financial amount of the credit being one of a financial amount dynamically loaded onto the financial transaction device via the at least one financial institution, a credit determined by at least one of a plurality of outcomes of the EGM, an amount inputted into the EGM; and

using the financial transaction device for one of depositing the financial amount into the at least one financial account of the at least one financial institution associated with the gaming network by one of the EGM and an automated teller machine (ATM), cashless wagering in the EGM, and purchasing the goods and services.

2. The method of claim 1, wherein the financial transaction device is at least one of a ticket-in/ticket-out (TITO) system, a pre-paid card device, a players club card, an identification card, a financial account deposit device, and the financial transaction device has at least one of a bar code, a magnetic strip, the financial amount, and the account identifier, and is provided by at least one of the EGM, the at least one financial institution, the gaming venue, and a non-gaming venue.

3. The method of claim 2, further including performing one of:

recognizing and validating one of paper currency and coin currency for being the financial amount loaded and stored onto the financial card device,

retaining a permanent storage record of the financial amount on the financial transaction device,

reading the financial amount on the financial transaction device using one of the bar code, the magnetic strip, and the account identifier linking the financial transaction card to the at least one financial account of the financial institution, and

representing the financial amount on the financial transaction device as the financial amount of the paper currency and the coin currency that is recognized and validated.

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4. The method of claim 3, further including using the financial transaction device for depositing the financial amount into the at least one financial account.

5. The method of claim 4, further including using the financial transaction device for depositing the financial amount into at least one financial account of the at least one financial institution associated with the gaming network using the ATM, wherein the at least one financial institution is a non-gaming financial institution having an association with a gaming venue.

6. The method of claim 4, further including depositing the financial amount into the at least one financial account using the financial transaction device using the ATM upon performing a cashing out operation from the EGM.

7. The method of claim 1, further including performing at least one of:

charging a fee associated with the use of the financial transaction card, and

charging the fee associated with the use of the financial transaction card to be allocated based on a plurality of allocation protocols between the at least one financial institution and a gaming venue.

8. The method of claim 1, further including performing a cashless wagering operation using the financial transaction device in the EGM.

9. The method of claim 1, further including purchasing the goods and services using the financial transaction device.

10. The method of claim 1, further including reading the financial amount on the financial transaction card using a financial transaction device reader associated with one of the gaming network and a non-gaming network.

11. The method of claim 1, further including using a host in the gaming network for one of acting as a proxy for communicating between the financial transaction device and the at least one financial institution associated with the ATM.

12. The method of claim 1, further including directly pairing the EGM and the ATM using a service based application system in the gaming network.

13. The method of claim 12, further including dynamically transferring the financial amount on the financial transaction device using the service based application system into the at least one financial account via the ATM.

14. A system for facilitating use of a financial transaction device of a cashless wagering system in a gaming system, the system comprising:

a gaming network;

a host in the gaming network;

an electronic gaming machine (EGM) in the gaming network in communication with the host;

at least one master controller in communication with the EGM and the host;

a financial transaction device, the EGM having a payment acceptor for funding a bet associated with the financial transaction device;

at least one financial institution in communication with the financial transaction device;

an automated teller machine (ATM) in communication with at least one of the gaming network, the at least one financial institution, and the financial transaction device;

a plurality of gaming and non-gaming venues in communication with the financial transaction device; and

at least one processor device, in communication with the at least one master controller, operable on the EGM and the ATM, wherein the at least one processor device:

provides the financial transaction device, having at least an account identifier linking the financial transaction

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device to at least one financial account of the at least one financial institution associated with the gaming network, for one of depositing a financial amount into the at least one financial account, cashless wagering in the EGM, and use by a plurality of gaming and non-gaming venues for payment of goods and services, wherein providing the financial transaction device readies the financial transaction device for one of depositing the financial amount into the at least one financial account, cashless wagering in the EGM, and payment of the goods and the services,

loads and stores on the financial transaction device the financial amount of credit available for play on the EGM, wherein the financial amount of the credit being one of a financial amount dynamically loaded onto the financial transaction device via the at least one financial institution, a credit determined by at least one of a plurality of outcomes of the EGM, an amount inputted into the EGM, and

uses the financial transaction device for one of depositing the financial amount into the at least one financial account of the at least one financial institution associated with the gaming network by one of the EGM and the ATM, cashless wagering in the EGM, and purchasing the goods and services.

15. The system of claim 14, wherein the financial transaction device is at least one of a ticket-in/ticket-out (TITO) system, a pre-paid card device, a players club card, an identification card, a financial account deposit device, and the financial transaction device has at least one of a bar code, a magnetic strip, the financial amount, and the account identifier, and is provided by at least one of the EGM, the at least one financial institution, the gaming venue, and a non-gaming venue.

16. The system of claim 15, wherein the at least one processor device performs one of:

recognizing and validating one of paper currency and coin currency for being the financial amount loaded and stored onto the financial card device,

retaining a permanent storage record of the financial amount on the financial transaction device,

reading the financial amount on the financial transaction device using one of the bar code, the magnetic strip, and the account identifier linking the financial transaction card to the at least one financial account of the financial institution, and

representing the financial amount on the financial transaction device as the financial amount of the paper currency and the coin currency that is recognized and validated.

17. The system of claim 16, wherein the at least one processor device uses the financial transaction device for depositing the financial amount into the at least one financial account.

18. The system of claim 17, wherein the at least one processor device uses the financial transaction device for depositing the financial amount into at least one financial account of the at least one financial institution associated with the gaming network using the ATM, wherein the at least one financial institution is a non-gaming financial institution having an association with a gaming venue.

19. The system of claim 17, wherein the at least one processor device deposits the financial amount into the at least one financial account using the financial transaction device using the ATM upon performing a cashing out operation from the EGM.

20. The system of claim 14, wherein the at least one processor device performs at least one of:

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charging a fee associated with the use of the financial transaction card, and

charging the fee associated with the use of the financial transaction card to be allocated based on a plurality of allocation protocols between the at least one financial institution and a gaming venue.

21. The system of claim 14, wherein the at least one processor device performs a cashless wagering operation using the financial transaction device in the EGM.

22. The system of claim 14, wherein the at least one processor device purchases the goods and services using the financial transaction device.

23. The system of claim 14, wherein the at least one processor device readies the financial amount on the financial transaction card using a financial transaction device reader associated with one of the gaming network and a non-gaming network.

24. The system of claim 14, wherein the at least one processor device uses a host in the gaming network for one of acting as a proxy for communicating between the financial transaction device and the at least one financial institution associated with the ATM.

25. The system of claim 14, wherein the at least one processor device directly pairs the EGM and the ATM using a service based application system in the gaming network.

26. The system of claim 25, wherein the at least one processor device dynamically transfers the financial amount on the financial transaction device using the service based application system into the at least one financial account via the ATM.

27. A computer program product for facilitating use of a financial transaction device of a cashless wagering system in a gaming system with at least one processor device, the computer program product comprising a non-transitory computer-readable storage medium having computer-readable program code portions stored therein, the computer-readable program code portions comprising:

a first executable portion that provides the financial transaction device, having at least an account identifier linking the financial transaction device to at least one financial account of at least one financial institution associated with the gaming network, for one of depositing a financial amount into the at least one financial account, cashless wagering in an electronic gaming machine (EGM) having a payment acceptor for funding a bet associated with the financial transaction device, and use by a plurality of gaming and non-gaming venues for payment of goods and services, wherein providing the financial transaction device readies the financial transaction device for one of depositing the financial amount into the at least one financial account, cashless wagering in the EGM, and payment of the goods and the services; and

a second executable portion that loads and stores on the financial transaction device the financial amount of credit available for play on the EGM, wherein the financial amount of the credit being one of a financial amount dynamically loaded onto the financial transaction device via the at least one financial institution, a credit determined by at least one of a plurality of outcomes of the EGM, an amount inputted into the EGM and uses the financial transaction device for one of depositing the financial amount into the at least one financial account of the at least one financial institution associated with the gaming network by one of the EGM and an automated teller machine (ATM), cashless wagering in the EGM, and purchasing the goods and services.

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28. The computer program product of claim 27, wherein the financial transaction device is at least one of a ticket-in/ticket-out (TITO) system, a pre-paid card device, a players club card, an identification card, a financial account deposit device, and the financial transaction device has at least one of a bar code, a magnetic strip, the financial amount, and the account identifier, and is provided by at least one of the EGM, the at least one financial institution, the gaming venue, and a non-gaming venue.

29. The computer program product of claim 28, further including a third executable portion that performs one of: recognizing and validating one of paper currency and coin currency for being the financial amount loaded and stored onto the financial card device, retaining a permanent storage record of the financial amount on the financial transaction device, reading the financial amount on the financial transaction device using one of the bar code, the magnetic strip, and the account identifier linking the financial transaction card to the at least one financial account of the financial institution, and representing the financial amount on the financial transaction device as the financial amount of the paper currency and the coin currency that is recognized and validated.

30. The computer program product of claim 29, further including a fourth executable portion that uses the financial transaction device for depositing the financial amount into the at least one financial account.

31. The computer program product of claim 30, further including a fifth executable portion that uses the financial transaction device for depositing the financial amount into at least one financial account of the at least one financial institution associated with the gaming network using the ATM, wherein the at least one financial institution is a non-gaming financial institution having an association with a gaming venue.

32. The computer program product of claim 30, further including a fifth executable portion that deposits the financial amount into the at least one financial account using the finan-

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cial transaction device using the ATM upon performing a cashing out operation from the EGM.

33. The computer program product of claim 27, further including a third executable portion that performs at least one of:

- charging a fee associated with the use of the financial transaction card, and
- charging the fee associated with the use of the financial transaction card to be allocated based on a plurality of allocation protocols between the at least one financial institution and a gaming venue.

34. The computer program product of claim 27, further including a third executable portion that performs a cashless wagering operation using the financial transaction device in the EGM.

35. The computer program product of claim 27, further including a third executable portion that purchases the goods and services using the financial transaction device.

36. The computer program product of claim 27, further including a third executable portion that reads the financial amount on the financial transaction card using a financial transaction device reader associated with one of the gaming network and a non-gaming network.

37. The computer program product of claim 27, further including a third executable portion that uses a host in the gaming network for one of acting as a proxy for communicating between the financial transaction device and the at least one financial institution associated with the ATM.

38. The computer program product of claim 27, further including a third executable portion that directly pairs the EGM and the ATM using a service based application system in the gaming network.

39. The computer program product of claim 27, further including a third executable portion that dynamically transfers the financial amount on the financial transaction device using the service based application system into the at least one financial account via the ATM.

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EXHIBIT 4

EXHIBIT 4

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Related U.S. Application Data					
	continuation of application No. 14/043,724, filed on Oct. 1, 2013, now Pat. No. 9,240,100, and a continuation-in-part of application No. 13/327,584, filed on Dec. 15, 2011, now Pat. No. 8,814,681, which is a continuation-in-part of application No. 12/943,789, filed on Nov. 10, 2010, now Pat. No. 8,088,014.				
(60)	Provisional application No. 61/708,495, filed on Oct. 1, 2012, provisional application No. 61/801,122, filed on Mar. 15, 2013, provisional application No. 61/303,106, filed on Feb. 10, 2010.				
(52)	U.S. Cl. CPC <i>G07F 17/3223</i> (2013.01); <i>G07F 17/3225</i> (2013.01); <i>G07F 17/3239</i> (2013.01); <i>G07F 17/3241</i> (2013.01); <i>G07F 17/3246</i> (2013.01); <i>G07F 17/3251</i> (2013.01)				
(58)	Field of Classification Search CPC G07F 17/3211; G07F 17/3225; G07F 17/3251; G06Q 30/0226 See application file for complete search history.				
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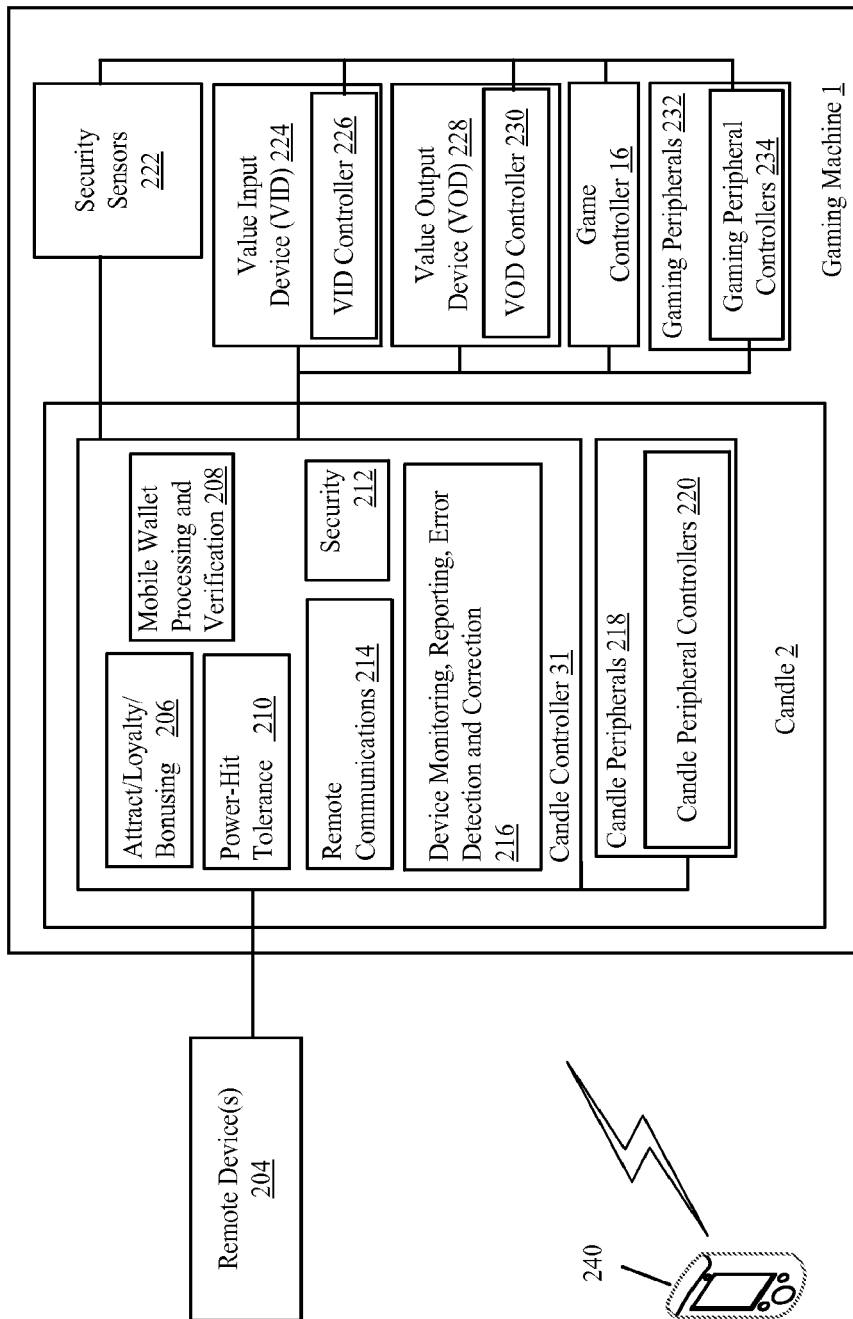


Figure 1

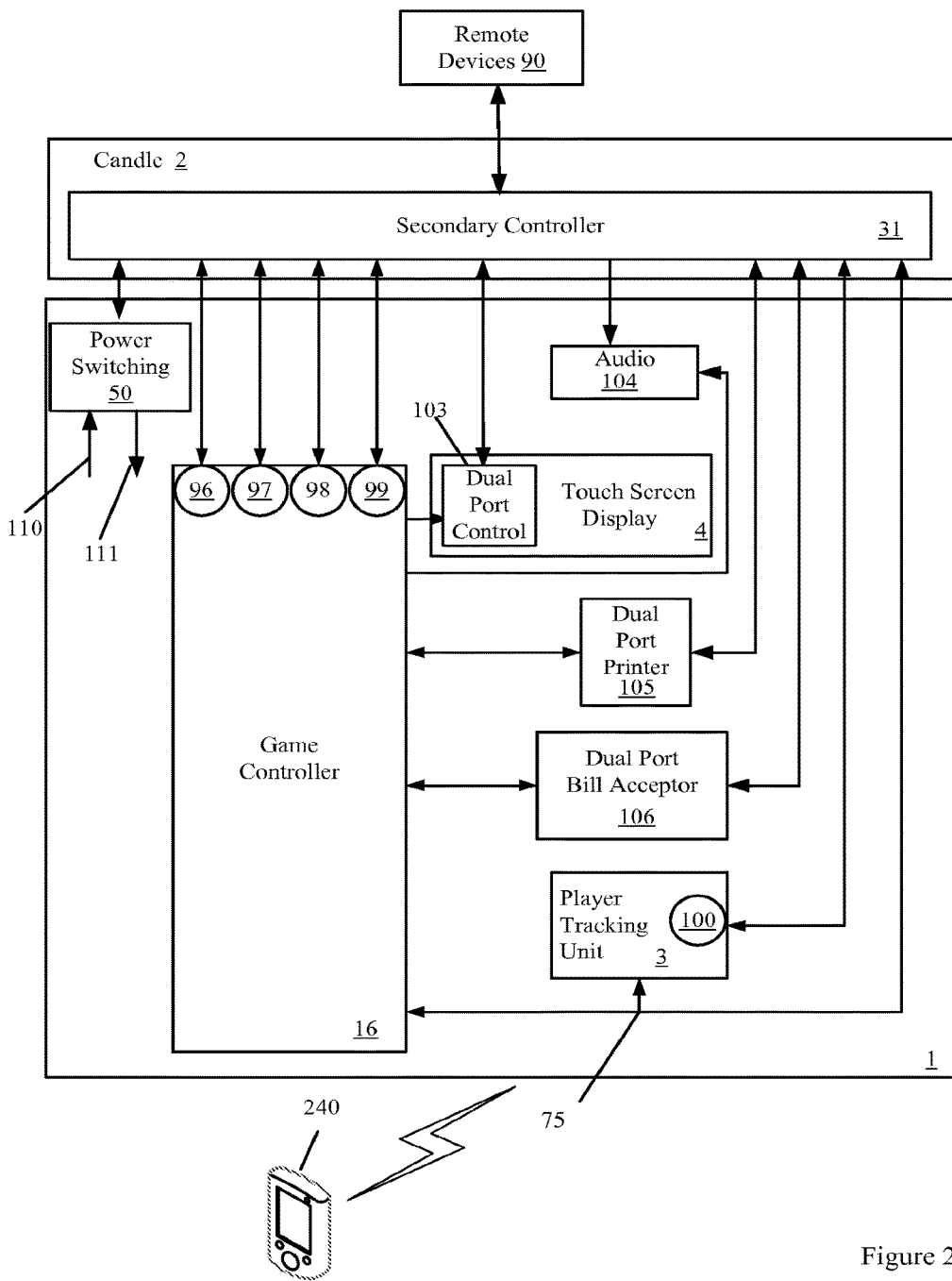


Figure 2

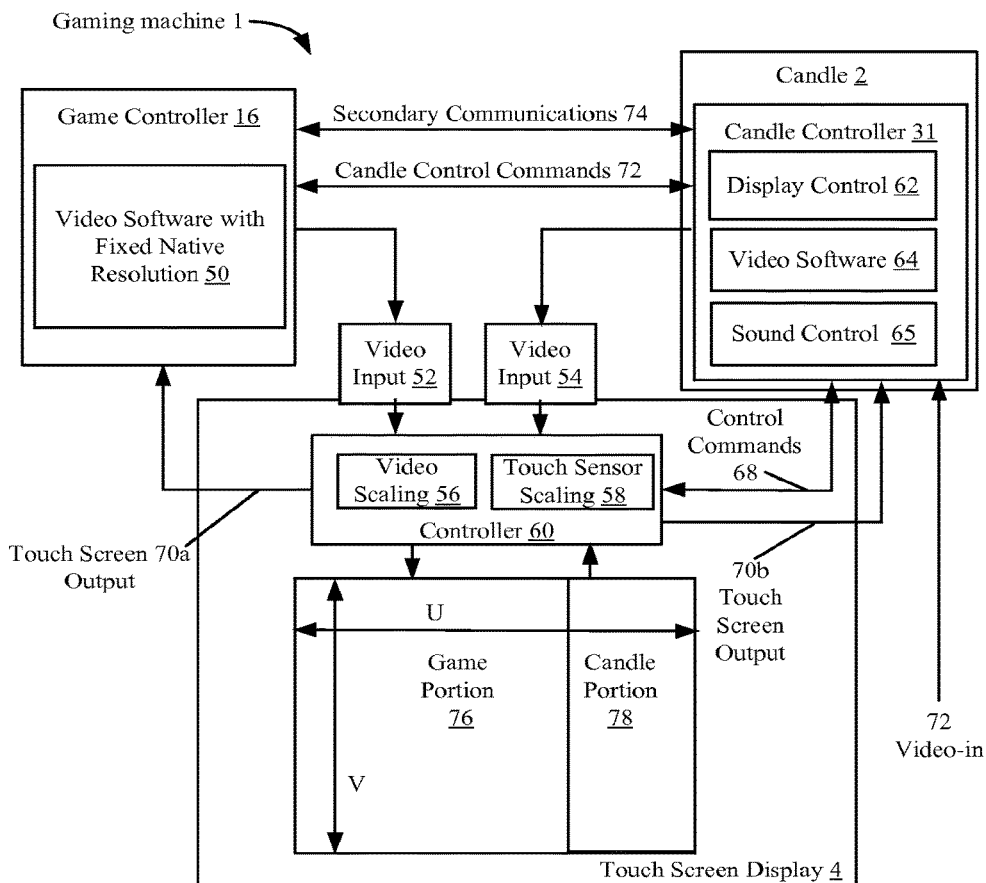


Figure 3A

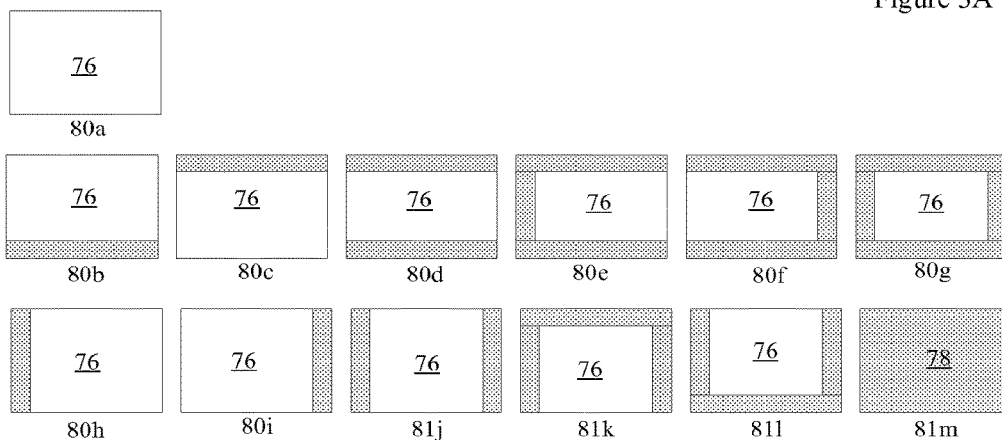


Figure 3B

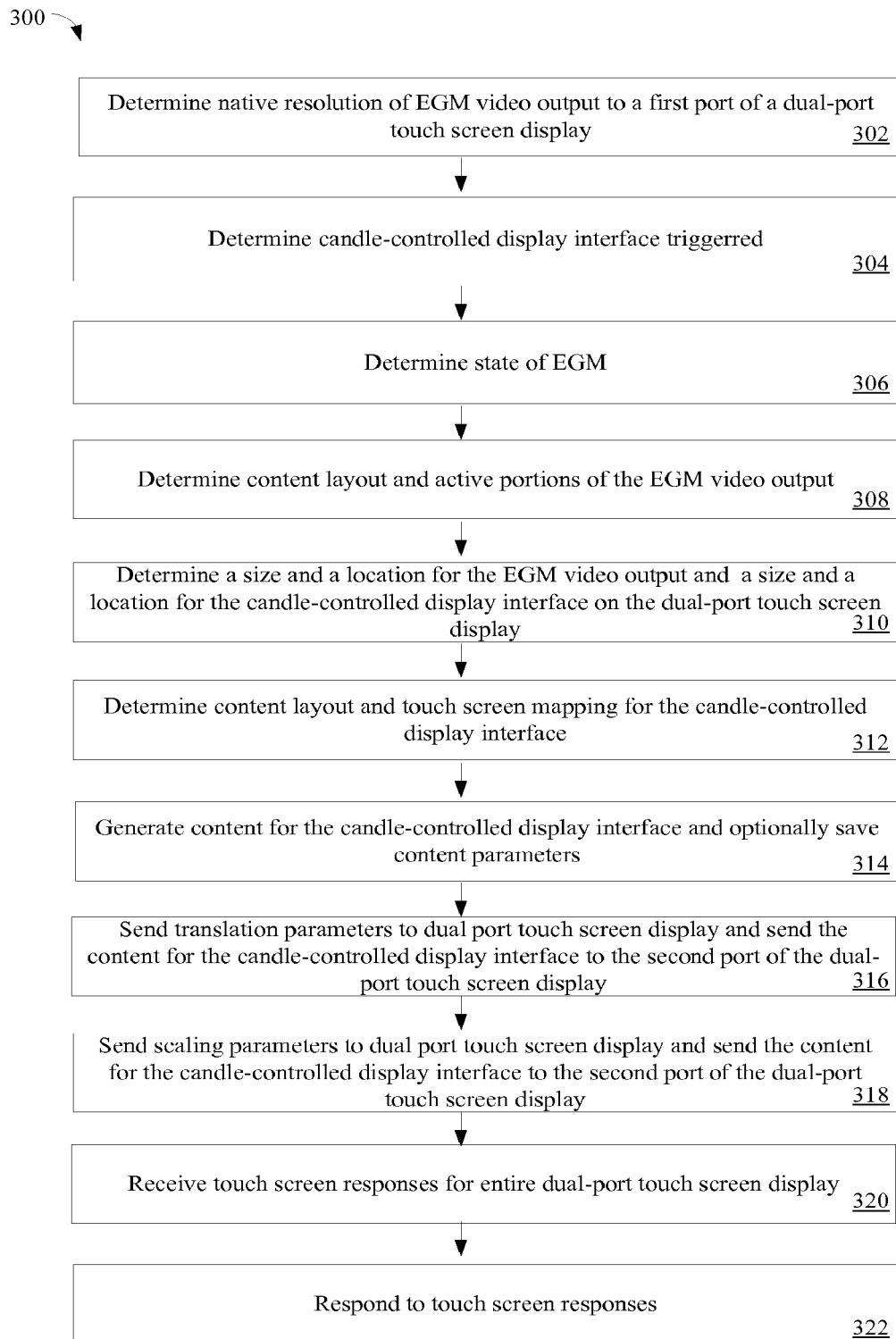


Figure 4

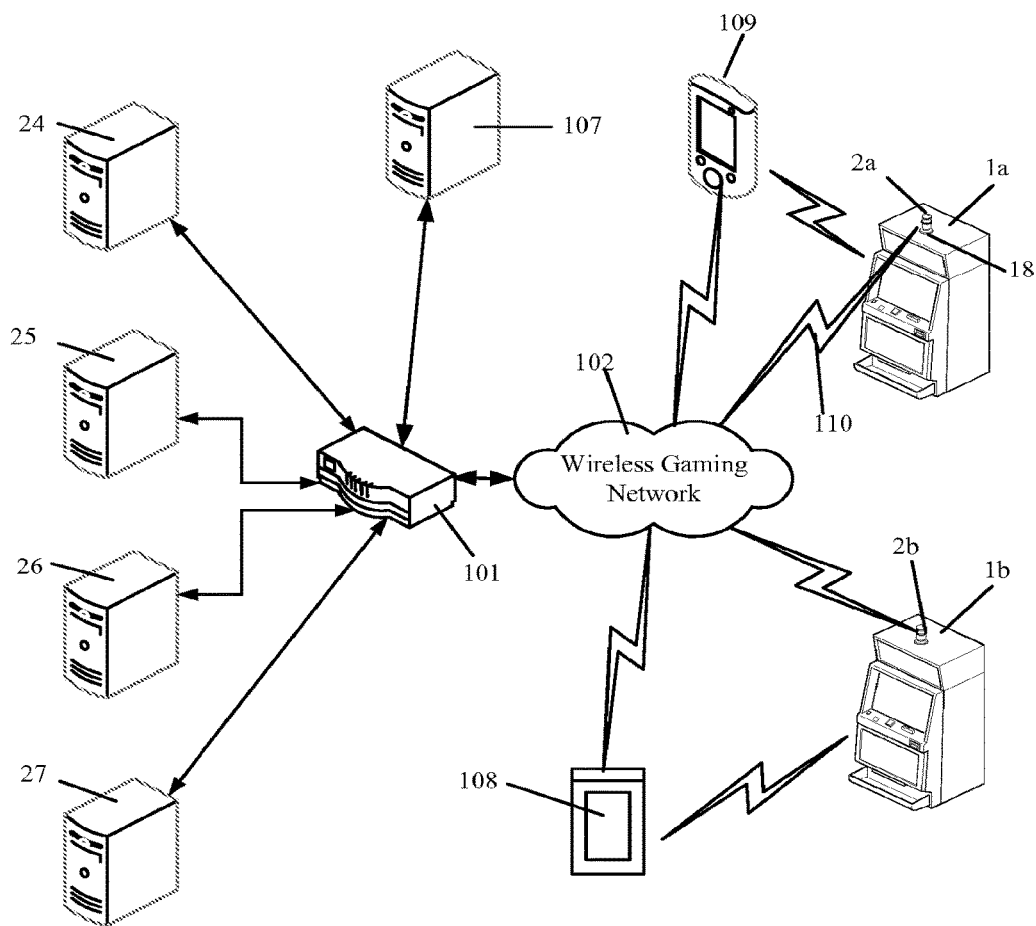


Figure 5

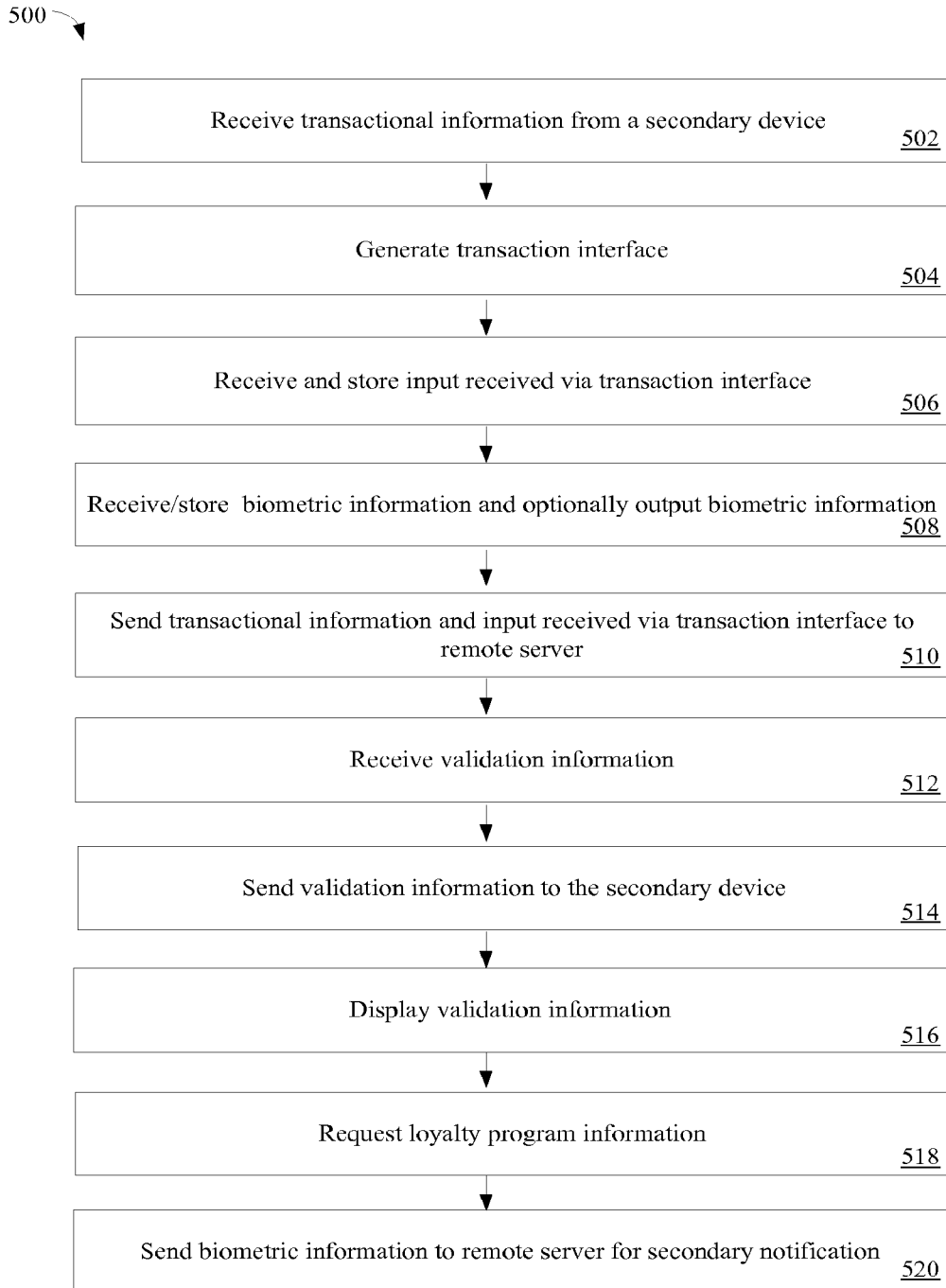


Figure 6

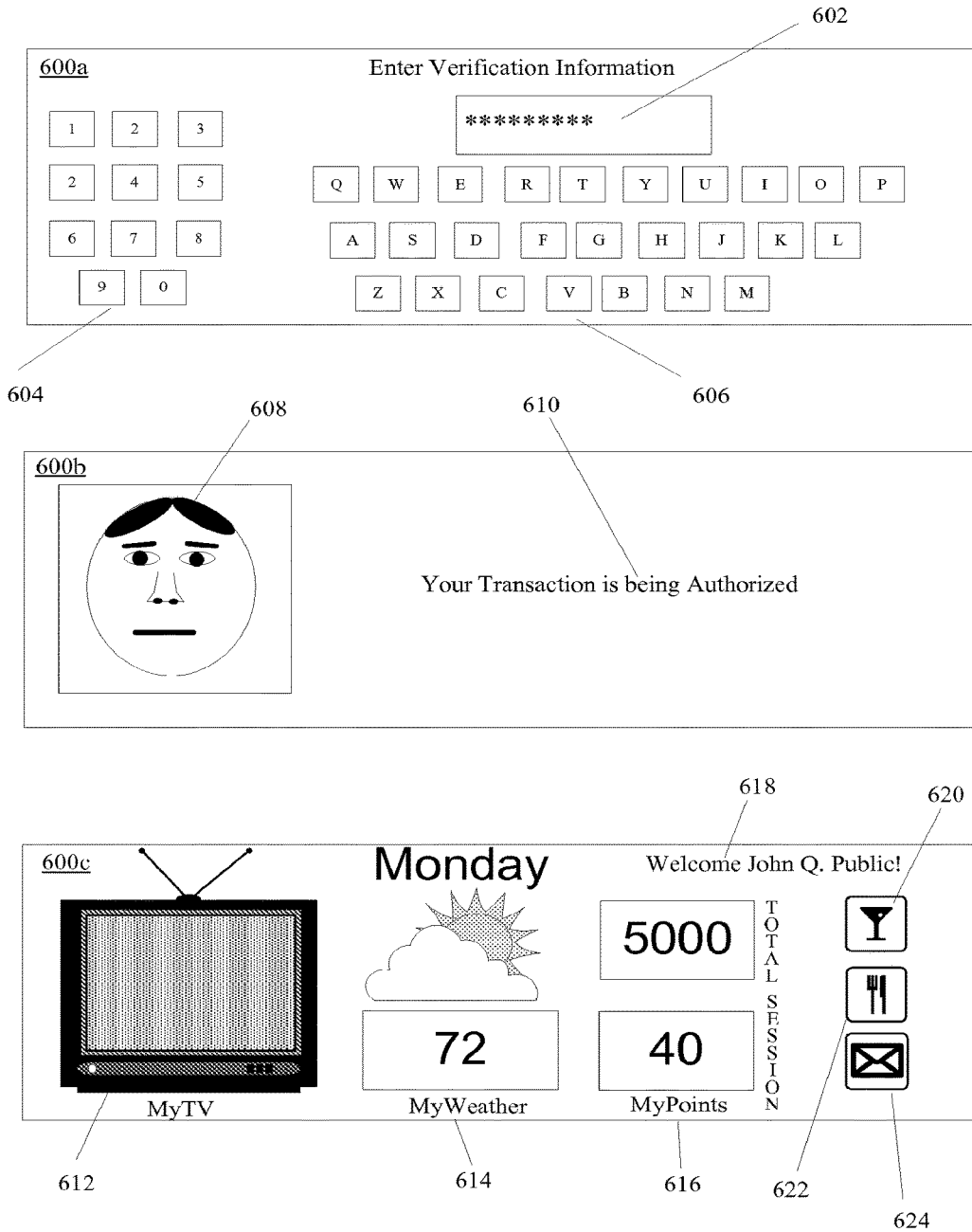


Figure 7

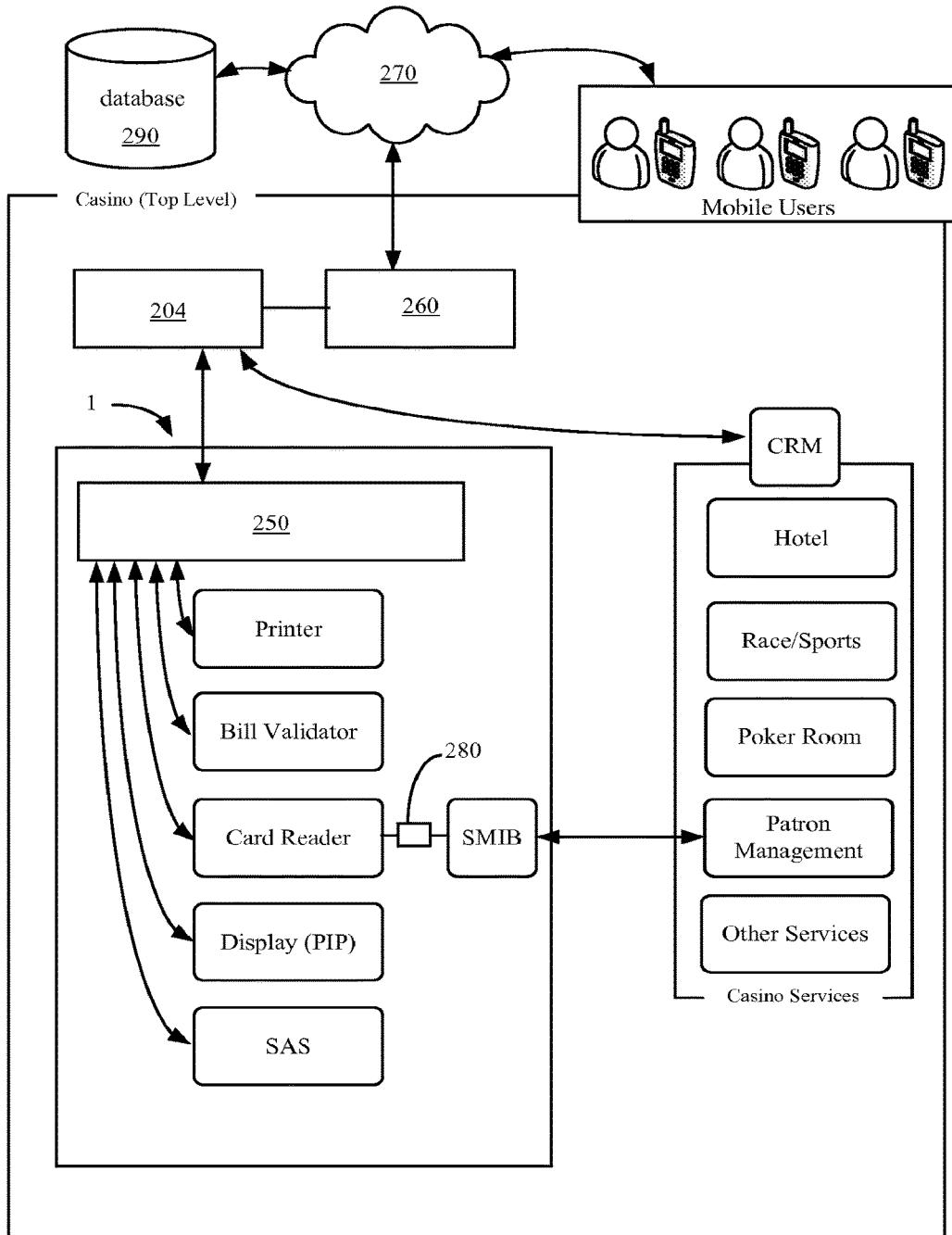


Figure 8

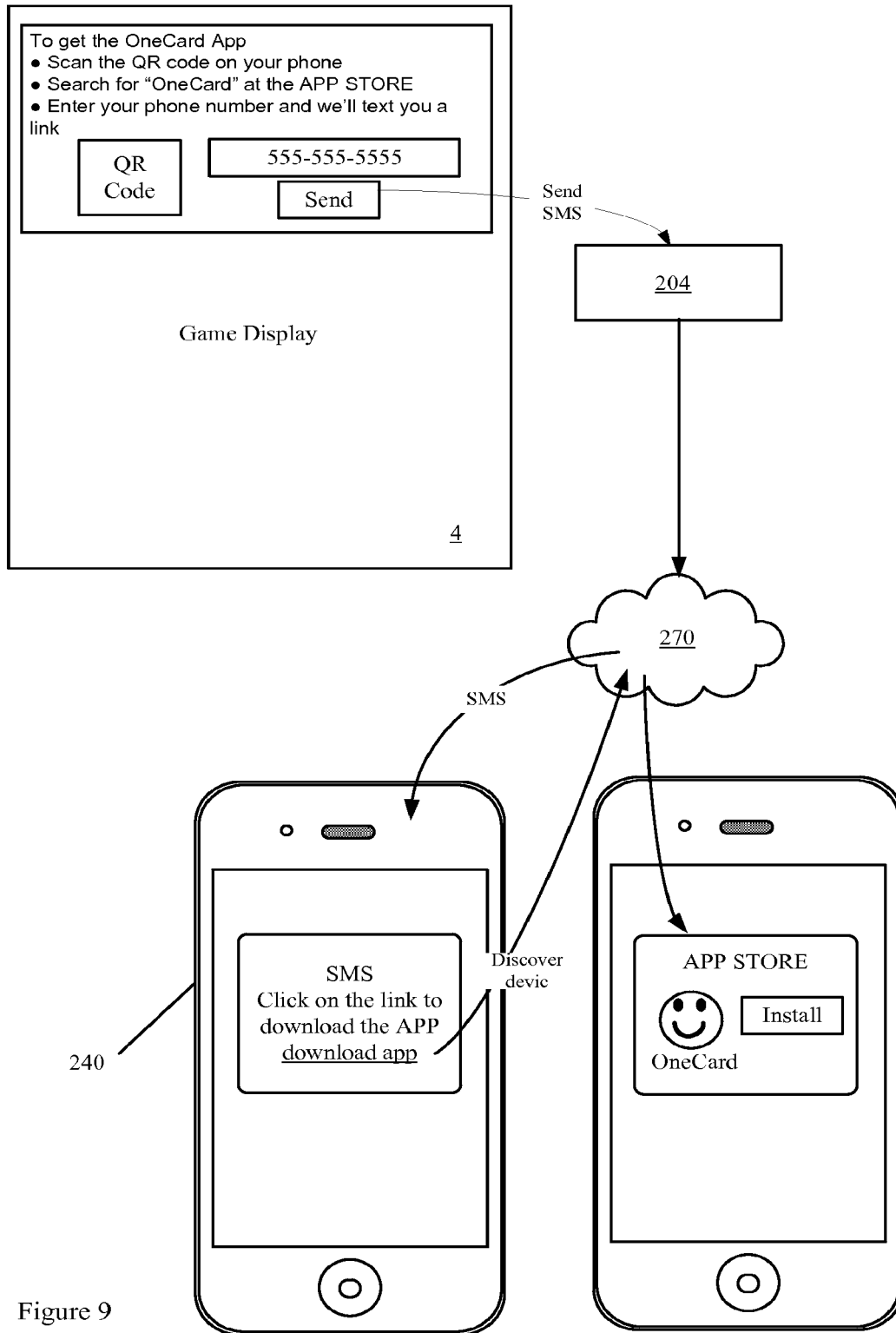


Figure 9

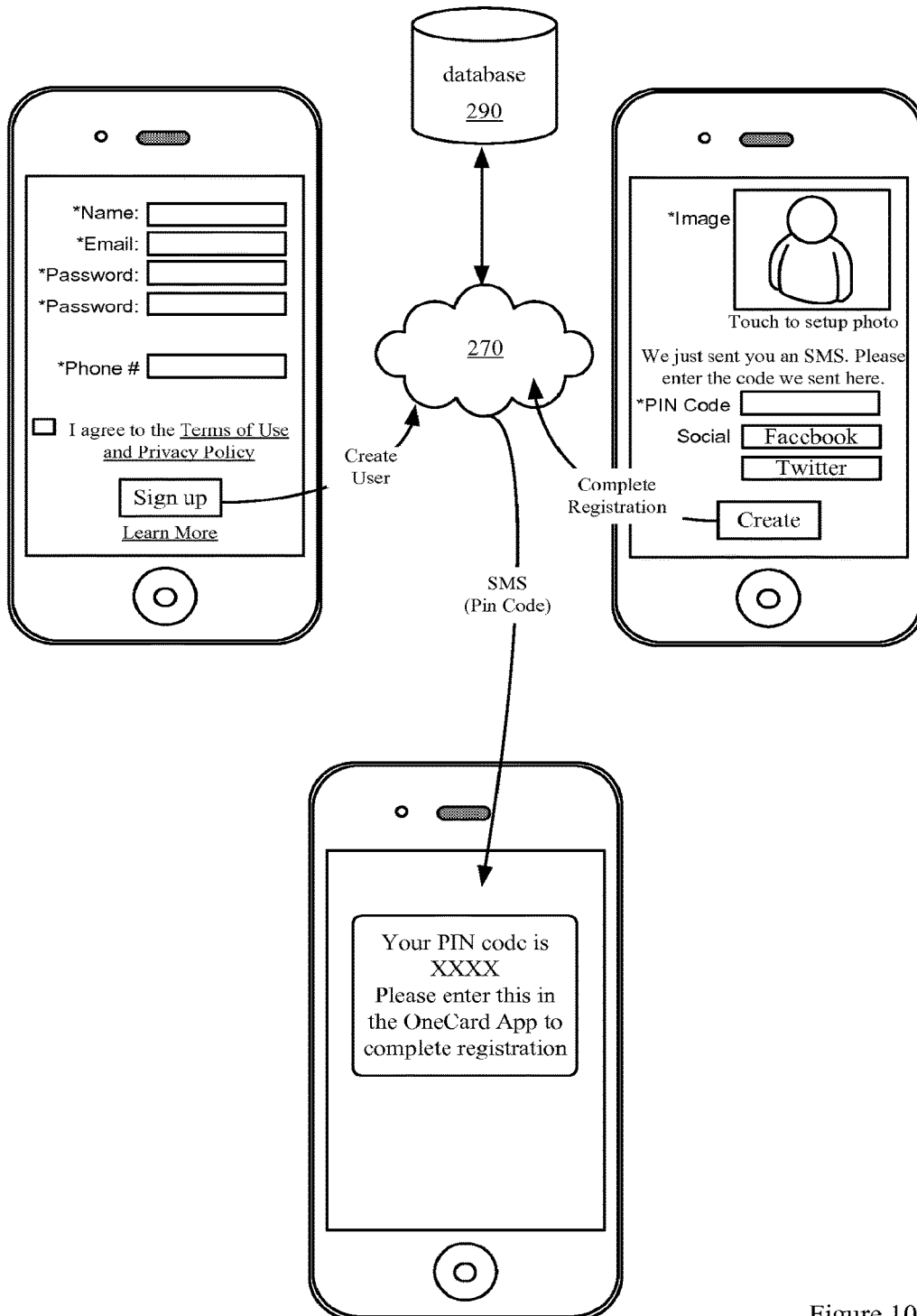


Figure 10

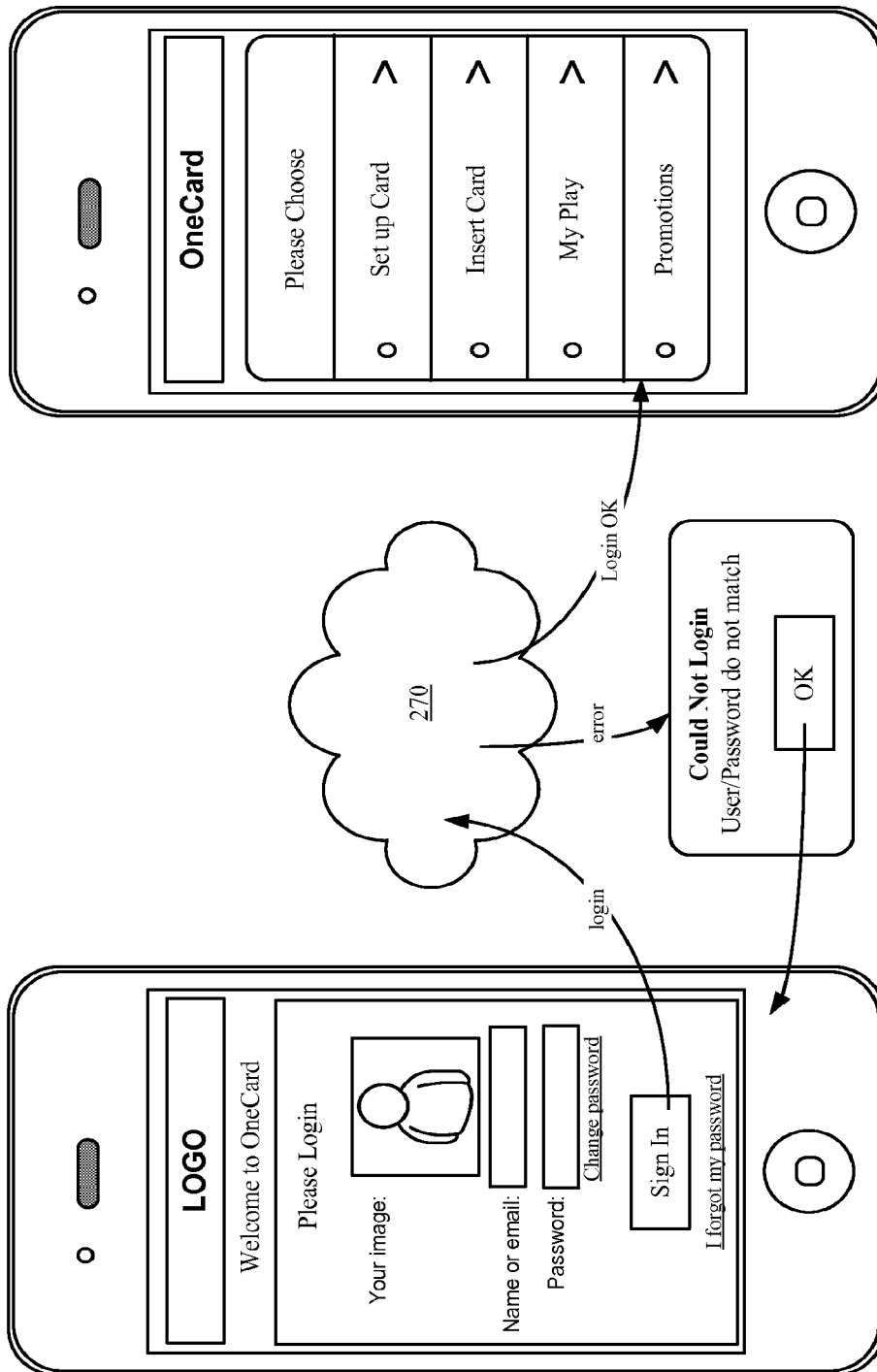


Figure 11

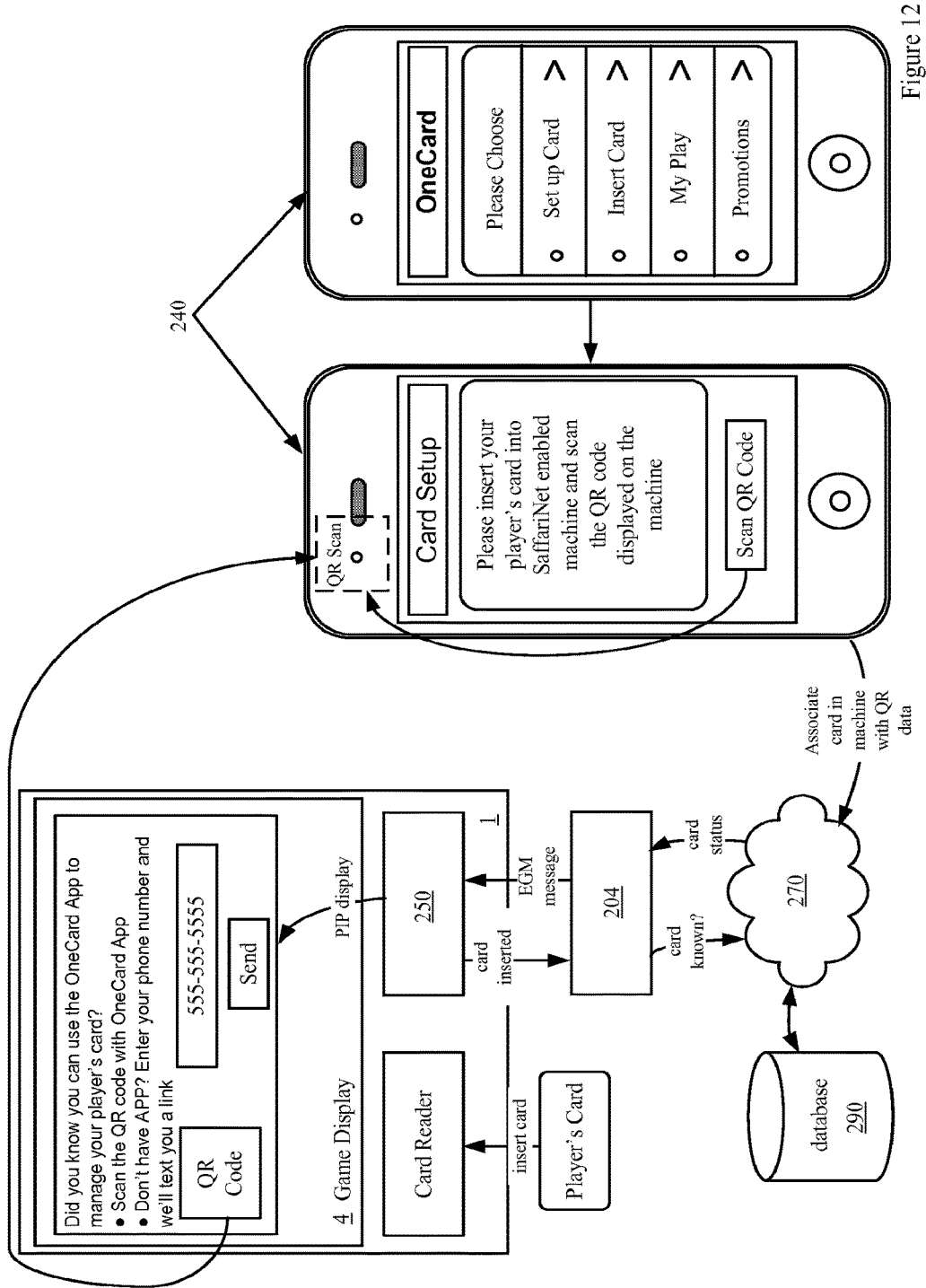


Figure 12

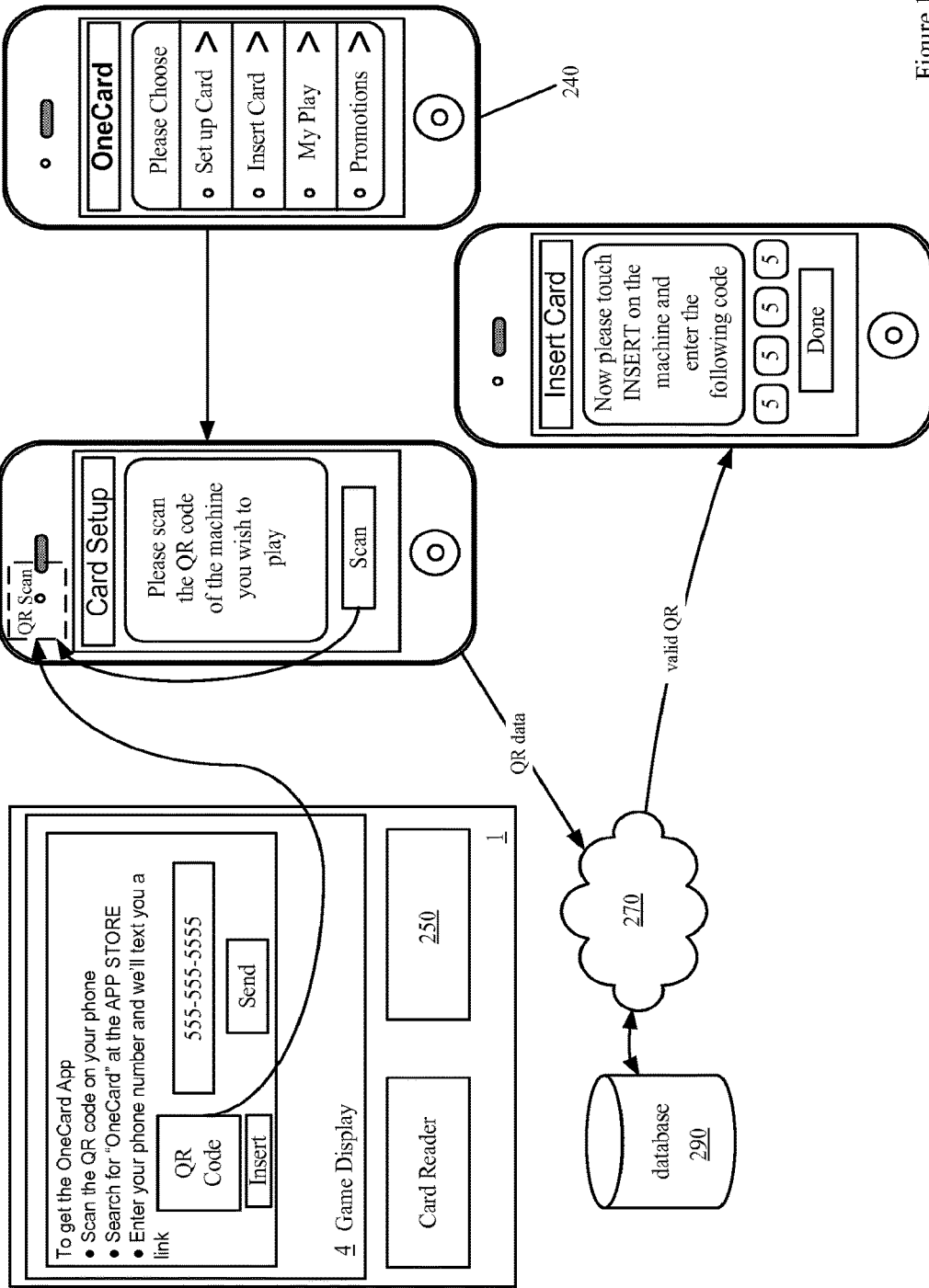


Figure 13

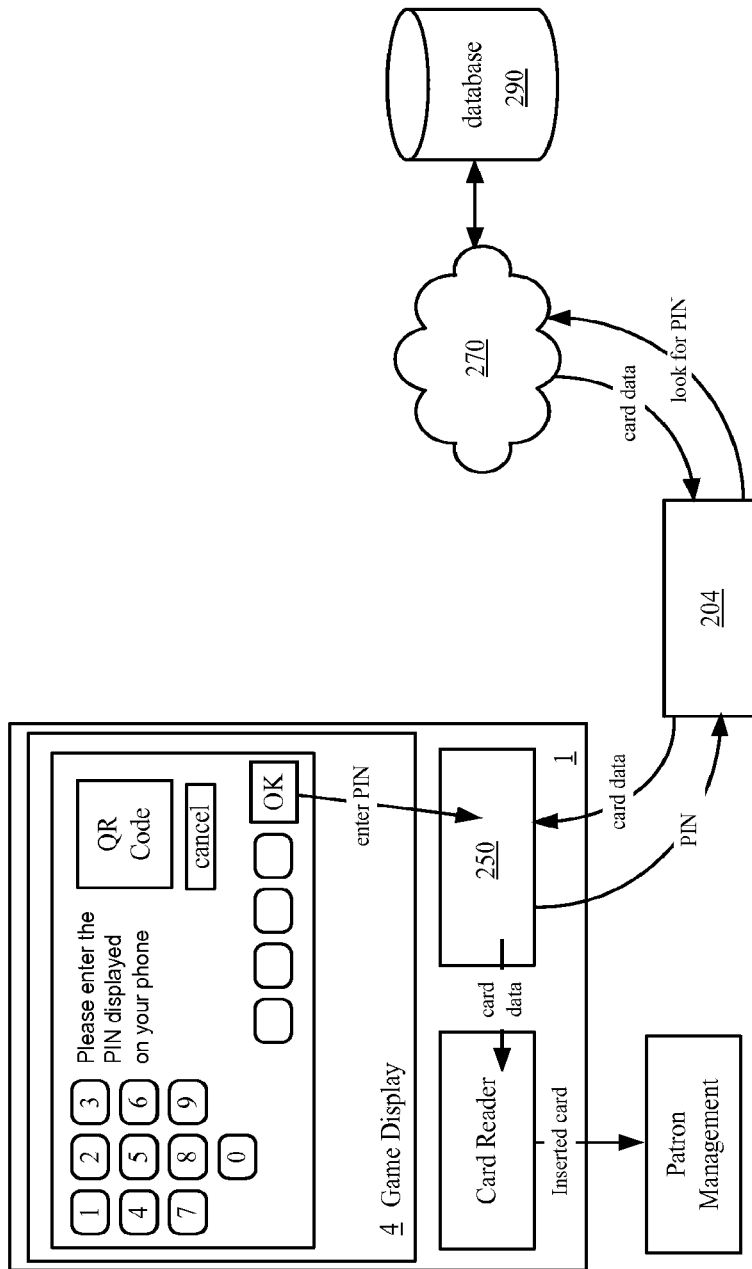


Figure 14

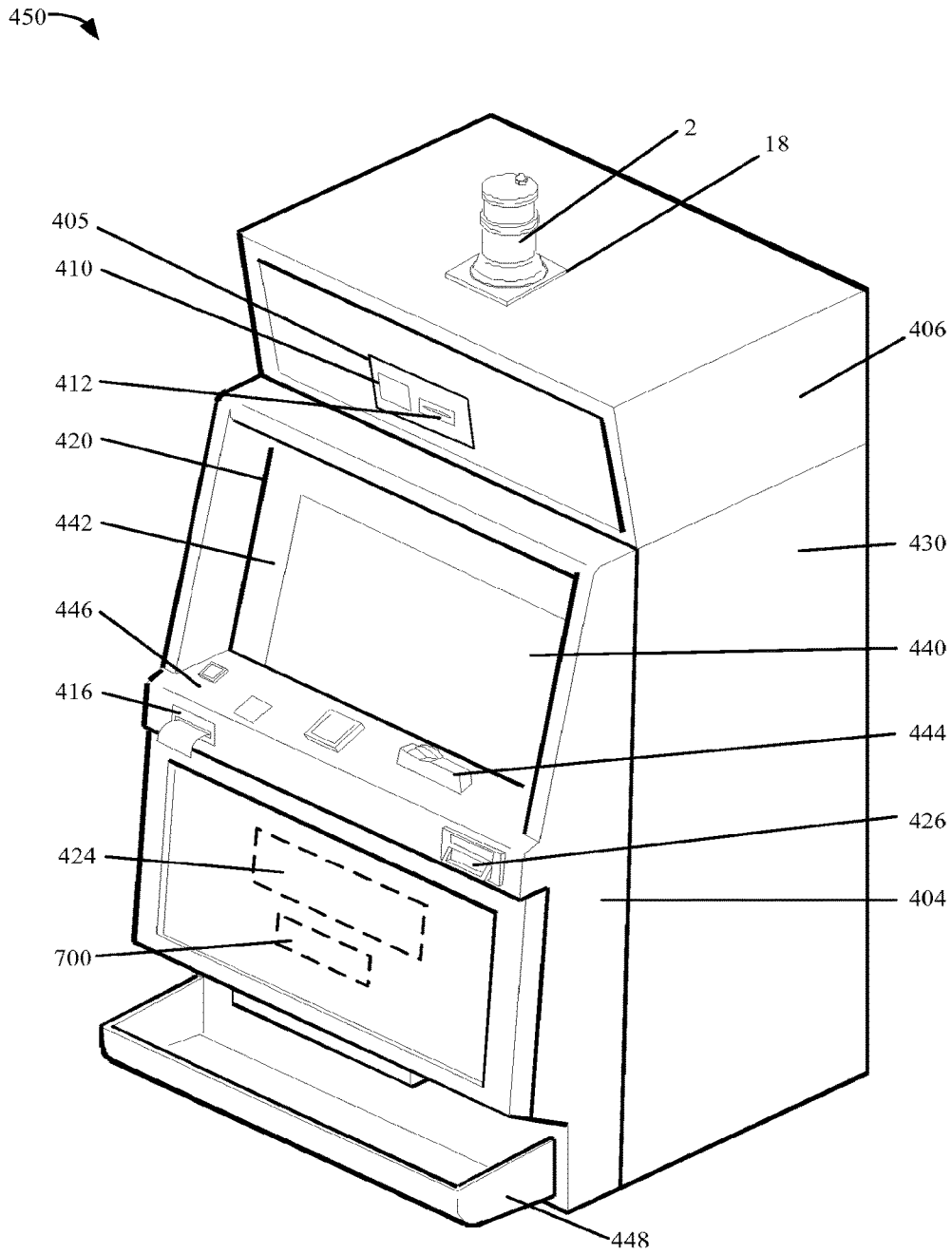


Figure 15

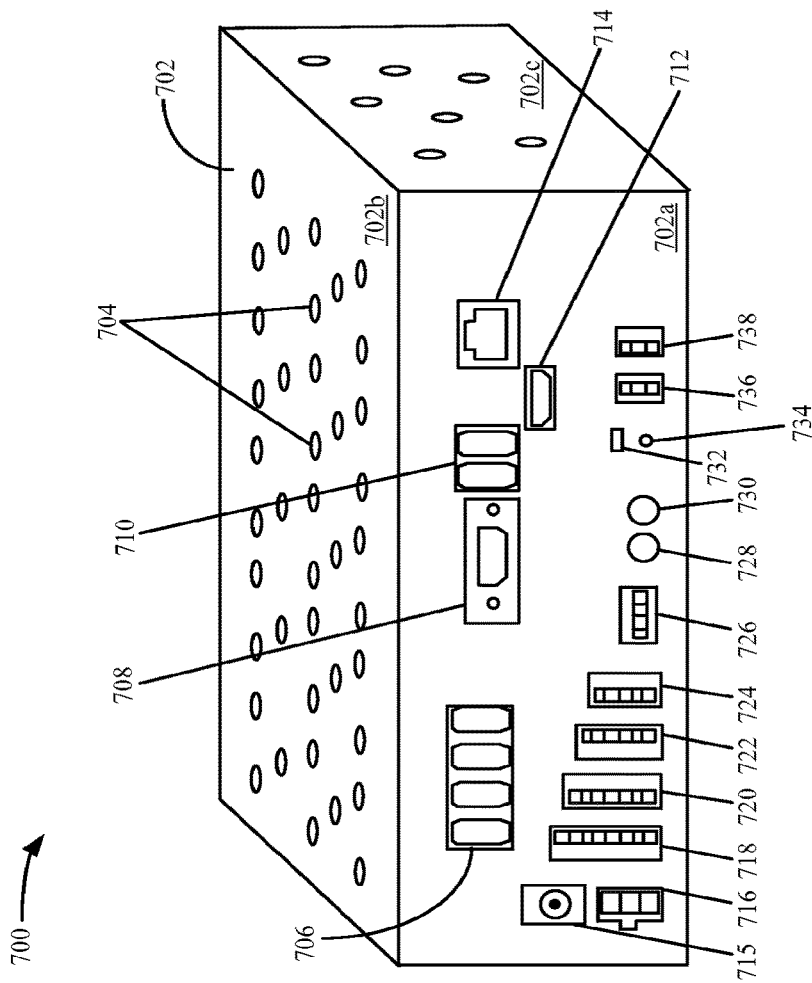


Figure 16

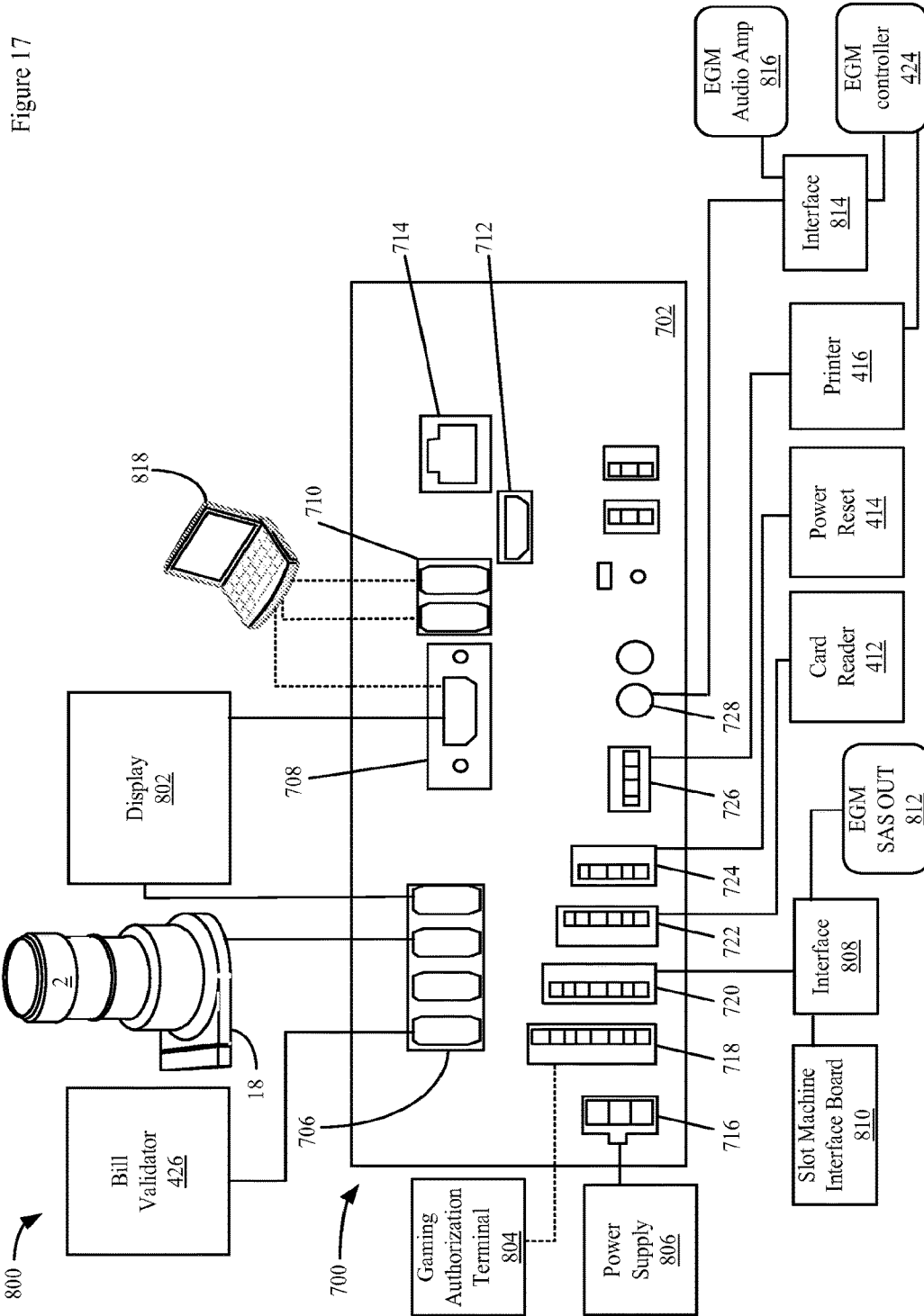


Figure 17

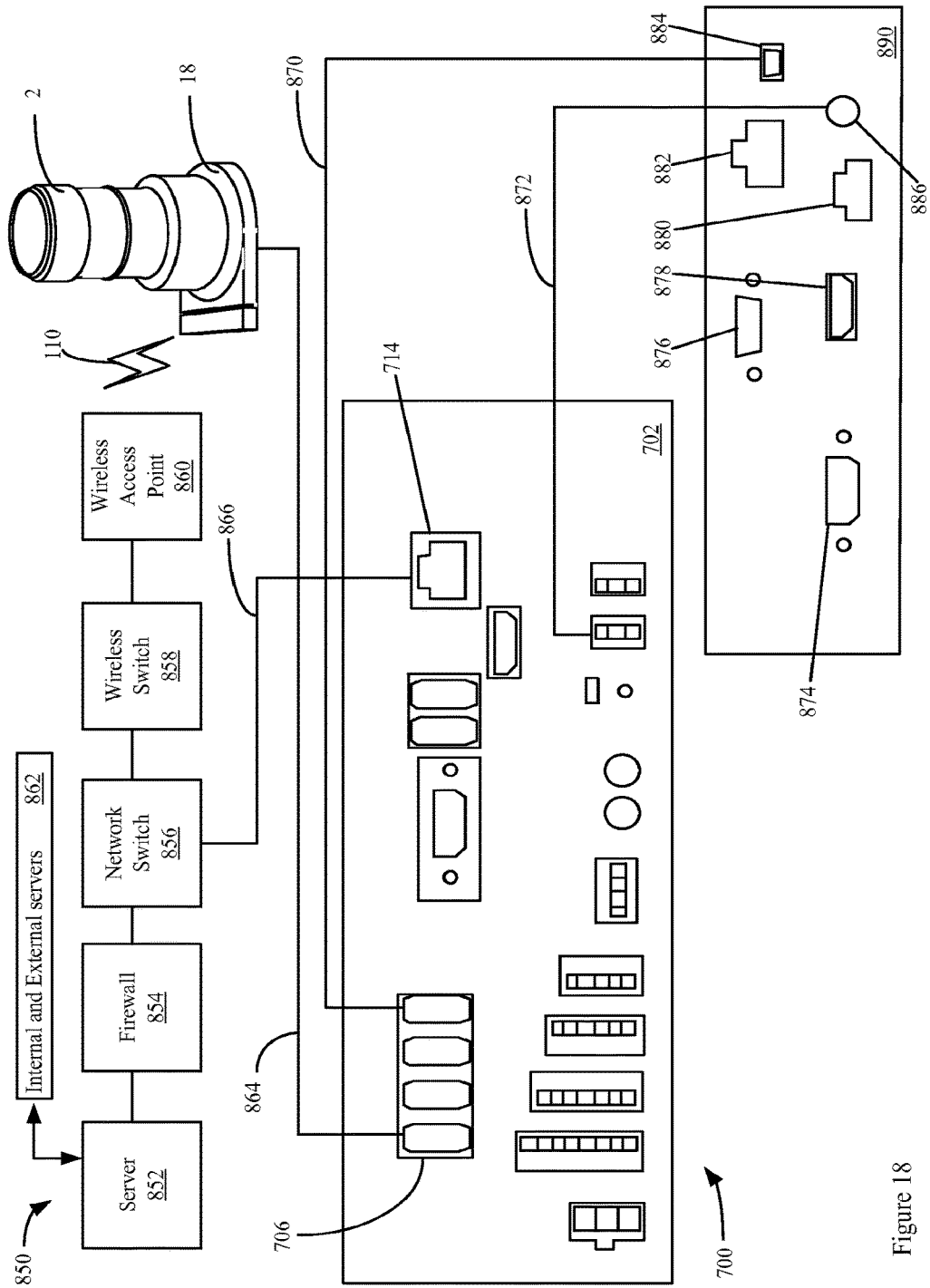


Figure 18

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VIRTUAL PLAYERS CARD

PRIORITY CLAIM

This application is a continuation of, claims the benefit of and priority to U.S. patent application Ser. No. 14/970,332, filed on Dec. 15, 2015, which is a continuation of, claims the benefit of and priority to U.S. patent application Ser. No. 14/043,724, filed on Oct. 1, 2013, now U.S. Pat. No. 9,240,100, which claims the benefit of and priority to U.S. Provisional Patent Application No. 61/708,495, filed on Oct. 1, 2012, and which also claims the benefit of and priority to U.S. Provisional Patent Application No. 61/801,122, filed on Mar. 15, 2013, and which is a continuation-in-part of, claims the benefit of and priority to U.S. patent application Ser. No. 13/327,584, filed on Dec. 15, 2011, now U.S. Pat. No. 8,814,681, which is a continuation-in-part of, claims the benefit of and priority to U.S. patent application Ser. No. 12/943,789, filed on Nov. 10, 2010, now U.S. Pat. No. 8,088,014, which claims the benefit of and priority to U.S. Provisional Patent Application No. 61/303,106, filed on Feb. 10, 2010, the entire contents of which are each incorporated by reference herein.

BACKGROUND

1. Field of the Invention

The invention relates to gaming devices that provide communication capabilities and enhanced gaming functions on an electronic gaming machine.

2. Description of the Related Art

Casinos derive a large portion of their revenues from electronic gaming machines, including mechanical and video slot machines. The operating costs associated with maintaining electronic gaming machines is an important factor to casino operators. To maximize their profitability, casino operators wish to minimize the electronic gaming machine operating costs.

A significant component of the operating costs is related to the performance of maintenance operations requiring access to the interior of a gaming machine. For instance, access to the interior of the gaming machine is needed to periodically remove cash from the gaming machine, such as coins in a drop box or bills stored in a bill stacker. As another example, access to the interior of the gaming machine is needed to periodically replenish paper used to print ticket vouchers for cashless gaming applications.

For security and regulatory purposes, electronic gaming machines include a number of locked enclosures that are monitored by an internal security system. The locked enclosures and security system help to prevent unauthorized access to resources within the electronic gaming machine that may be targets of theft or tampering, such as deposited money or gaming software. To address a maintenance issue that requires access to interior portions of the gaming machine, often two or more keys carried by separate individuals can be required. During the performance of the maintenance operation in the interior, one individual not performing the maintenance may be required to watch the other individual performing the maintenance operation. Thus, a significant contributor to the gaming machine operating costs is labor costs associated with maintenance.

In addition to labor costs, while the gaming machine is being maintained it is not available for game play. Thus, revenue is lost which also contributes to the operating costs. Further, some maintenance operations, such as replenishing blank tickets that can be used to print redeemable ticket

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vouchers involve material costs. Thus, some maintenance operations contribute both material costs and labor costs to the gaming machine operating costs.

Balanced against minimizing operating costs are providing functions that make the machines more convenient for a player to use and encourage repeated use of the machines. For instance, a bill validator on a gaming machine is not required and its use increases gaming machine operating costs. However, the availability of a bill validator makes a gaming machine more convenient for a player to use which outweighs the additional operating costs associated with the bill validator. As another example, loyalty programs and associated hardware that allow for player rewards and a personalization of a gaming session increases operating costs. Nevertheless, it has been found that these features make a game play session more satisfying to players such that the average amount of game play or the amount of repeat business from a typical player is increased. The increase in game play or repeat business outweighs the operating costs associated with providing these features.

Thus, in view of the above, apparatus and method are desired that either reduce gaming machine operating costs or provide new features with benefits to players that outweigh the additional operation costs associated with providing the new features.

SUMMARY

Broadly speaking, the embodiments disclosed herein describe relate to providing enhanced gaming functionality to wagered-based gaming devices, such as but not limited to mechanical slot reel or video slot machines. In particular, the embodiments can be used on gaming devices that execute regulated gaming software to control a play of a wager-based game on the gaming device. A game controller on the gaming device can execute the regulated gaming software. In one embodiment, the enhanced gaming functionality can be generated using a secondary processor disposed within the cabinet of the gaming device or within a candle device. The candle device can be mounted to an exterior surface, such as the top portion, of a gaming machine cabinet. In particular embodiments, the enhanced gaming functionality can be generated without modifying the regulating gaming software executed on the electronic gaming machine.

According to an embodiment, an electronic wager-based gaming machine is provided. The gaming machine includes a game controller, a secondary processor for communicating with a remote server, a card reader, and a spoofing device. The spoofing device is operably connected to the card reader and a patron management system external to the gaming machine. The spoofing device can send a signal to the patron management system indicating that a physical loyalty card is inserted into the card reader when a mobile loyalty card is virtually inserted into the gaming machine without a physical loyalty card being inserted into the card reader.

According to another embodiment, a method is provided for tracking game play of a wager-based game on an electronic gaming machine using a virtual mobile loyalty card. A mobile loyalty card virtually inserted into the electronic gaming machine is recognized. The mobile loyalty card is virtually inserted after the portable electronic device scans a QR code, or some other type of optically formatted data, displayed on the electronic gaming machine. The virtually inserted mobile loyalty card is then associated with a patron's data stored in a remote database. Game play at the electronic gaming machine can then be tracked and associated with the mobile loyalty card.

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Other aspects and advantages will become apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate, by way of example, the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The described embodiments will be readily understood by the following detailed description in conjunction with the accompanying drawings, wherein like reference numerals designate like structural elements, and in which:

FIG. 1 is a block diagram of a gaming machine including a candle device in accordance with the described embodiments.

FIG. 2 is a block diagram of a gaming machine including dual port devices communicatively coupled to a candle device in accordance with the described embodiments.

FIG. 3A is block diagram of a gaming machine including a dual port touch screen display communicatively coupled to a candle device in accordance with the described embodiments.

FIG. 3B is block diagram of picture in a picture (PIP) modes for a dual port touch screen display in accordance with the described embodiments.

FIG. 4 is a flow chart of a method for controlling dual port touch screen display in accordance with the described embodiments.

FIG. 5 is a diagram of a gaming system including gaming machines outfitted with candle devices and configured to communicate with mobile devices in accordance with the described embodiments.

FIG. 6 is a flow chart of a method for verifying transactions in accordance with the described embodiments.

FIG. 7 includes diagrams of display interfaces generated using a candle device in accordance with the described embodiments.

FIG. 8 is a block diagram of a gaming system in accordance with the described embodiments.

FIG. 9 shows some exemplary methods of acquiring the mobile application for use with a mobile loyalty card.

FIG. 10 shows an embodiment of a method of setting up a mobile loyalty card account.

FIG. 11 illustrates an exemplary method of virtualizing an existing player loyalty card.

FIG. 12 illustrates an exemplary method of associating an existing player loyalty card with a newly created mobile loyalty card account.

FIGS. 13 and 14 illustrate an exemplary method of virtual insertion of a mobile loyalty card.

FIG. 15 is a perspective drawing showing exterior portions of an electronic gaming machine in accordance with the described embodiments.

FIG. 16 is a perspective drawing of a secondary gaming device including numerous power and communication interfaces in accordance with the described embodiments.

FIG. 17 is a connection diagram of a gaming device coupled to an electronic gaming machine in accordance with the described embodiments.

FIG. 18 is a diagram of gaming system configured to provide picture in a picture gaming services on electronic gaming machines in accordance with the described embodiments.

DETAILED DESCRIPTION OF THE DESCRIBED EMBODIMENTS

In the following detailed description, numerous specific details are set forth to provide a thorough understanding of

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the concepts underlying the described embodiments. It will be apparent, however, to one skilled in the art that the described embodiments can be practiced without some or all of these specific details. In other instances, well known process steps have not been described in detail in order to avoid unnecessarily obscuring the underlying concepts.

Typically, electronic gaming machines can be provided with a game controller and a number of peripheral devices coupled to the game controller, such as monitors, printers, bill/ticket acceptors, lights and bonus mechanisms. The game controller can be configured to control the play of a wager-based game on the gaming machine including determining game outcomes using a random number generator and interacting with the peripheral devices to present the determined game outcome to a user of the gaming machine. The interactions between the game controller and the peripheral devices can involve sending commands and/or data to the peripheral devices and receiving status information from the peripheral device.

Because regulatory regulations can require a long and expensive approval process for introducing new game software, the gaming software used by the game controller to provide a wager-based game on the gaming machine is rarely updated once the gaming machine is deployed in the field, such as within a casino. Thus, once deployed, the functionality of the game controller is fixed and the game controller may not recognize the introduction of new devices and new features. However, it can be desirable to provide upgrade capabilities in a gaming machine so that new features and functions can be introduced.

One approach to providing upgrade capabilities is to assume the gaming software on the game controller will be fixed and provide a secondary processor that is separate from the game controller. The software of the secondary processor can be upgraded to add additional gaming functions. In one embodiment, the secondary processor can be configured so that it does not perform wager-based game functions, such as the determination of an outcome for the wager-based game and an associated award. Since the secondary processor does not perform gaming functions, the software approval process for a device including the secondary processor can be greatly simplified.

In particular embodiments, the secondary processor can be installed in an electronic gaming machine (EGM) or electronic gaming table (EGT) at the time of manufacture. In other embodiments, the secondary processor can be installed in an EGM or EGT after it is deployed in the field as part of a retrofit process. As described above, the secondary processor can be used to generate new gaming functions on an on-going basis. Each time a new gaming function is introduced, the secondary processor can be configured to implement the new gaming function without modifying the regulated gaming software executed by the game controller on an EGM or EGT prior to the introduction of the new gaming function.

Peripheral devices, such as bill validators and printers, also run regulated gaming software. In some embodiments, new gaming functions can be introduced using a secondary processor where the new gaming functions are associated with one or more peripheral devices. For example, new gaming functions can involve communications between one or more peripheral devices and the secondary processor where the communications can include the one or more peripheral devices receiving commands from the secondary processor. In some instances, the introduction of the new gaming functions may require modification and re-approval of the regulated game software on one or more of the

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peripheral devices. In other embodiments, a new gaming function can be introduced without modifying the regulated game software existing on the game controller and existing one or more of the peripheral devices prior to the introduction of the new gaming function.

In some of the embodiments described herein, the secondary processor can be incorporated into a candle device. In other embodiments, a secondary processor is included in the cabinet of the gaming machine. In yet other embodiments, multiple secondary processors can be utilized in combination with one another, such as a secondary processor on a candle device and a secondary processor in a gaming device installed within a cabinet of the EGM. The functions attributed to one gaming device, such as a candle device including a secondary processor, are described for the purposes of illustration only as other gaming devices including a secondary processor can perform the functions in lieu of the candle device or in combination with the candle device. For example, in one embodiment, a secondary processor on the candle device can be used to control a wireless interface which allows communications with a mobile device, such as a smart phone, near an EGM or EGT. In another embodiment, a secondary device on a gaming device installed within the cabinet of an EGM or EGT can control the wireless interface to provide this functionality.

A candle device is typically mounted to the top cabinet of a gaming machine for maximum visibility. It includes a number of stages of different colors that can be lit alone or in combination with other stages to convey information about a state of a gaming machine. For instance, often a candle device is configured to light up a stage of a particular color when an attendant is needed at the gaming machine. Traditional candle devices include a simple controller for turning on-off different lighting stages in response to commands from a game controller. However, a secondary processor and memory can be added to the candle device to greatly increase the functions that the candle device can perform. For instance, the secondary processor can control additional peripheral devices, such as audio devices, image capture devices and display devices, integrated into the candle device as well as peripheral devices, such as bill validators, printers, displays and audio devices integrated into the main cabinet of a gaming machine. The peripheral devices can be controlled to add additional functionality to the gaming machine. In addition, the secondary processor can be used to provide enhanced communication functionality, such as wireless communications between the gaming machine and remote servers or wireless communications with portable electronic devices carried by casino employees and patrons alike.

In particular embodiments, some of the peripheral devices can be dual port devices where a first port is communicatively coupled to the game controller and a second port is communicatively coupled to the secondary processor. In one embodiment, the main touch screen display of the gaming machine that is used to output the wager-based game can be a dual port device. The game controller can be configured to send video content to the main display that allows a wager-based game to be played on the gaming machine via the first port. The secondary processor can be coupled to the main display and configured to send supplementary video content to the main display via the second port. The secondary processor can also be configured to control a size and position of a portion of the display allocated to showing the video content from the game controller and a size and position of a portion of the display allocated to showing video content from the candle device. The video content

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from the candle device that is output to the main display under control of the secondary processor can be used to provide additional features to the gaming machine.

In an alternate embodiment, the game controller and the secondary processor can share a single port into a device, such as a display or a bill validator. In some instances, the secondary processor can be disposed between game controller and the single port into the device such that the secondary processor can receive communications output from the single port to another device, such as game controller, and receive communications to the single port from another device, such as the game controller. The secondary processor can be configured to let the communications pass through without modification or can be configured to modify the communications in some manner before it is allowed to reach its target destination.

In one embodiment, the secondary processor can be used to generate an interface on the main display that can enable verification of an electronic transaction involving an interaction between a gaming machine and a portable electronic device, such as a smart phone, carried by a player. As an example, the electronic transaction may involve an electronic transfer of funds to the gaming machine. In particular embodiments, sound and wireless communication capabilities can be provided with a candle device. Alternatively, the candle can be configured to control a remote audio device, such as speakers mounted to a gaming machine cabinet. In one embodiment, the remote audio device can also be configured to be controlled by a gaming controller.

One or more antennas for receiving and transmitting wireless communication, such as for communication via Bluetooth™ or Wi-Fi™ related communication protocols, can be integrated into the candle device. In general, one or more antennas can be provided at different locations within the candle device. In other embodiments, one or more antennas can be provided at different locations on or within the electronic gaming machine.

The candle device can include one or more image capture devices, such as camera. The image capture devices can be configured to capture still images or video data. Multiple image capture devices can be used to increase a field of view relative to the candle. In one embodiment, multiple image capture devices can be used to provide a 360 degree view around the candle. In other embodiments, a number of image capture device can be primarily orientated in a direction towards the front of a gaming machine to capture the activity of a person in front of the gaming machine and possibly on adjacent gaming machines.

In alternate embodiments, the candle device can be coupled to a remote image capture device. For instance, image capture device can be mounted to a player tracking unit installed within a gaming machine cabinet, a card reader installed within the gaming machine cabinet or at some other location on the gaming machine cabinet, such as within a top box. A wired or wireless communication connection can be implemented between a controller within the candle device and the image capture device. In one embodiment, the image capture device can be used in conjunction with the image capture device located within the candle device. In another embodiment, the image capture device can replace the image candle device such that the candle device no longer includes a camera mounted within its housing.

In one embodiment, all of the communication channels routed through the candle interface with a communication controller. The communication channels can be associated with pass through communications, such as communications from an external device routed to the gaming machine via

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the candle or communications generated at the game controller, player tracking controller or a peripheral device and sent to a remote device via the candle. For instance, pass through communication can include a communication from a game controller on a gaming machine to a remote server that is passed through the candle to allow the communications to be transmitted wirelessly to the remote sever. As described above, the candle can be configured to engage in bi-directional communications with various devices on a gaming machine (e.g., see FIGS. 1 and 2 and their associated description).

These communications channels may support various communication protocols. Thus, the processor can be configured to parse and generate messages associated with various communication protocols. For instance, the communication channels can be used to implement one or more of Ethernet, I2C, RS-232 and/or USB. Other communication protocols that may be used are RS-485, IEEE 1394 (Firewire), Netplex and other standard or proprietary communication interfaces used in the gaming industry as well as the computing industry. If available, these channels can be implemented as wired or wireless embodiments. For instance, a wireless communication protocol, such as wireless USB, can be implemented to allow for wireless communications between the candle and other devices within the gaming machine. Besides wireless communications, wireless power transmission may also be supported in candle.

In an alternate embodiment, a cabinet module can be provided that includes a number of connection interfaces, such as connection interfaces for power, candle inputs, Ethernet, the I2C, the RS-232 and USB. In operation, the cabinet module can be disposed within the cabinet of a device, such as a cabinet of a gaming machine. The cabinet module can include one or more processors and memory in addition to processors that are located in a secure enclosure in the external portion of the candle device. The functions described with respect to the candle controller can be distributed between processors located in the external portion of the candle device and processors located in the cabinet module. In one embodiment, the secure enclosure in the external portion of the candle device can at least include a processor for performing wireless functions associated with the candle device.

In a particular embodiment, the processor in the cabinet module can be coupled to a memory storage device within the cabinet module. In one embodiment, the memory storage device can be a solid state drive. The processor can be configured to only write data to the memory storage device if it is received from a remote server via the wireless communication connection from the external portion of the candle device or an Ethernet port. The Ethernet port allows the processor to communicate with a remote server via a wired Ethernet connection.

Further, the processor in the cabinet module can be configured to only copy data from the memory storage device and send it to the remote server via the wireless interface and/or the Ethernet connection. If an attempt is made to copy data from the memory storage device or write data to the memory storage device, via an alternate communication port, such as the USB or RS-232 port, the processor can be configured to perform a remedial action that prevents copying data from or writing to the memory storage device. For example, the processor can be configured to reboot the candle device in response to detecting a

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thorized port. The reboot can be triggered as long as a device is attempting to copy or write from the unauthorized communication port.

For example, if a USB dongle is connected to the USB port an attempt is made to write data from the dongle to the memory storage device or an attempt is made to copy data from the memory storage device. The processor in the cabinet module can be configured to cause the candle device to repeatedly reboot as long as the USB dongle remains coupled to the USB port and are attempting to write or copy data from the memory storage device. When the device is removed, the candle device can finish the boot condition and return to a regular operating condition. However, it can be configured to report the attempt to a remote device, such as a remote server that communicates with the candle device wirelessly when communications are restored with the remote device.

As another security feature, the processor in the cabinet module can be configured to constantly maintain communications with one or more processors in the externally mounted candle device. When the processor in the candle device can't be detected by the processor in the cabinet module, the processor can be configured to trigger an error condition. The error condition might trigger a remedial action, such as shutting down or rebooting the candle device. When remote communications are restored to the processor in the cabinet module, such as via a wireless communication connection, then the processor in the cabinet module can report the error condition to a remote server.

In addition, a remote server can also be configured to constantly maintain communication with one or more processors in the externally mounted candle device and/or the processor in the cabinet module. If the processor in the externally mounted portion of the candle device cannot be detected and/or the processor in the cabinet module cannot be detected by the remote server, then the remote server can log an error condition and trigger a remedial action. For instance, when a processor in the external or internal portion of the cabinet device can't be detected, the remote server can be configured to send a message to a security person to investigate the gaming machine including the candle device with the cabinet module.

With respect to FIGS. 1 and 2, details of electronic gaming machines including the candle devices described above and interactions between the candle device and various gaming machine components are presented. As described above, a gaming device other than a candle device, such as a gaming device installed in a cabinet of the EGM can be used to interact in a manner attributed to the candle device. Thus, the candle device is depicted for the purposes of illustration and is not meant to be limiting.

FIG. 1 is a block diagram of a gaming machine 1 including a candle device 2 in accordance with some of the described embodiments. The candle 2 can be configured to communicate with one or more remote devices, such as 204, mobile devices, such as 240, and devices associated with the gaming machine 1, such as the game controller 16, security sensors 222, a value input device 224, a value output device 228 and other gaming peripherals 232. The candle 2 can include a candle controller 31 for controlling the communications with the various devices. The candle controller 31 can include one or more processors and memory.

A number of peripheral devices 218, such as but not limited displays, audio devices, cameras and lighting arrays can be associated with the candle 2. The candle controller 31 can be configured to control the peripherals 218 via communications with peripheral controllers 220 associated with

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each peripheral. In particular embodiments, the controller **31** can be configured to control the peripherals in conjunction with commands and/or data received from one or more remote devices, such as **204**. For instance, the remote server **204** can send a message to the controller **31** for output to a display associated with the candle **2**.

The candle controller **31** can include a processor and memory that is programmable to perform various functions. The functions can be related but are not limited to 1) security **212**, 2) device monitoring, reporting, error detection and correction **216**, 3) remote communications **214**, 4) attract, customer loyalty programs and bonusing **206** and 5) power-hit tolerance **210**. In various embodiments, the functions provided by the controller **31** can be modified or changed in response to receiving a download of software and/or firmware from a remote device.

The controller **31** can be configured to communicate with a value input device (VID) **224** via its VID controller **226** and a value output device (VOD) **228** via its VOD controller **230**. The value input devices **224** and the value output devices **228** are gaming peripherals that are used to add or remove value from the gaming machine **1**. Via a VID, value can be added to the gaming machine to allow wagers to be made on a wager-based game. Via a VOD, any value remaining on the gaming machine **1** can be removed, such as value accrued via successful wagers, can be removed.

The security functions **212** can be related to monitoring security devices associated with just the candle such as security sensors associated with a secure enclosure and/or cameras located on the candle **2**. Further, the candle controller can be configured to monitor security sensors associated with the gaming machine **1**, such as sensors **222** associated with locks on the gaming machine **2**. As described above, the remote communications **214** can involve sending communications from the candle **2** to remote devices. In a particular embodiment, the communications can be sent via a wireless communication interface.

The attract and bonusing features **206** can involve performing functions associated with a loyalty program, such as player tracking program. In particular embodiments, the controller **31** can be configured to perform functions often associated with a player tracking unit, such as associating game play on the gaming machine with a particular player, receiving and displaying player identification information and transferring free play credits to the gaming machine **1**. In general, a secondary processor, such as the controller **31**, can provide access to games in conjunction with or independent from a game generated by the game controller. In one embodiment, the secondary processor can generate games on which wagers can be made where the outcome of the game is output to an EGM or EGT. Alternatively, as described in more detail below, player tracking functions can be performed by a secondary processor located in the cabinet of the gaming machine **1**.

The power-hit tolerance **210** can be used to preserve data in the event of a loss of power or a power fluctuation on the gaming machine **2**. As described above with respect to FIG. **4**, the controller **31** can include a back-up power source. In the event of a power failure, the controller can be configured to operate with some data storage and communication capabilities using the back-up power source until power is restored to the gaming machine **1**. As an example, the power-hit tolerance function can be used to preserve data generated from one or more the gaming peripherals **232**, a value input device **224** or a value output device **228**.

The device monitoring, reporting, error detection and correction **216** can be associated with managing maintenance

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issues associated with peripheral devices, such as a VID **224** or a VOD **228**. Currently, unless an error condition that requires a technician to intervene occurs, maintenance schedules on VIDs and VODs on a gaming machine **1** are usually based on average reliability predictions, i.e., every device is treated the same. Therefore, some devices can be scheduled for maintenance when they do not need it while other devices may not receive maintenance when it is needed. Maintenance of VIDs and VODs can be labor intensive, which is costly to operators. Further, while a device is being maintained, revenues are not generated on the gaming machine **1**, which is also costly. Therefore, scheduling a device for maintenance that does not need it is costly to operators. However, not providing maintenance to device that needs it can also be costly. The device monitoring, reporting, error detection and correction **216** can be configured to provide better maintenance scheduling for devices, such as **224** and **228**, on the gaming machine **1**.

Examples of value input devices can include but are not limited to bill and ticket acceptors, coin acceptors and card readers. Via one or more of the VIDs, a value amount associated with a bill, ticket, coin, a card or an electronic wallet carried by the player can be added to the gaming machine. Examples of value output devices can include but are not limited to ticket printers, card writers and coin dispensers. Via one or more of the VODs, a value amount can be removed from the gaming machine **1**. For instance, a value amount removed from the gaming machine **1** can be associated with 1) a ticket dispensed from a ticket, 2) coins dispensed from a coin dispenser, 3) a value written to a portable instrument, such as a credit card or a hand-held device like a cell phone, or 4) a value transferred off the gaming machine **1** to a remote account via an electronic fund transfer from the gaming machine **1** associated with an electronic wallet carried by a player. The fund transfer can be associated with an electronic wallet carried by the player.

In one embodiment, value transactions, such as fund transfers associated with an electronic wallet can benefit from additional verification. For example, a bill validator on the gaming machine **1** can be configured to initiate an electronic funds transfer associated with a player's mobile wallet. The mobile wallet can be an electronic wallet associated with the player's mobile phone or tablet computer. In one embodiment, the game controller **16** can be configured with software that doesn't recognize the mobile wallet functions provided by the bill validator. Instead, the candle **2** can be configured to handle the processing. The processing of transaction involving a mobile wallet can involve communications with remote servers and verification of the transaction. These mobile wallet processing and verification functions can be generated via **208**.

FIG. **2** is a block diagram of a gaming machine **1** including dual port devices communicatively coupled to a candle device **2** in accordance with the described embodiments. The embodiment in the block diagram of FIG. **2** shows the optional elements of a dual-port bill acceptor **106**, a dual-port printer **105**, a touch screen display **4** with dual port control **103**, a dual port audio system **104**, and a monitoring connection **75** of the player tracking panel **3**. Dual port capability can be used to provide a non-intrusive method of maintaining system integrity and provide additional gaming features. Although not shown in the embodiment illustrated in FIG. **2**, it will be understood that a gaming machine can include dual port devices communicatively coupled to a secondary processor located in the cabinet of the gaming machine. In addition, one or more of

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the devices can be a single port device where a secondary processor and a game controller share access to the single port.

In a dual port device, a first port can be used to provide the existing communication peripheral interface from the gaming machine to the dual port device. The game controller 16 and the peripheral device can communicate via the first port in a manner fixed by the use of regulated gaming software executed by the game controller and regulated software and/or firmware used by the peripheral device. The second port can be used to provide an enhanced interface with the controller 31. The second port on the dual port devices may be connected to the candle controller 31 via an appropriate interface. In particular embodiments, the controller 31 can be configured to receive commands and/or data from remote devices that are sent to the dual port devices via the second port. Further, the controller 31 can be configured to receive data from the dual port devices that are sent to one or more different remote devices via one of the communication interfaces, such as a wireless communication interface, on the candle 2.

The dual port touch screen display 4 can be configured to receive video content from each of the game controller 16 and the candle 2. In one embodiment, the dual port control 103 on the display 4 can be configured to receive sizing, scaling and positioning commands that allow content received from multiple sources to be displayed in different portions of the display. The sizing, positioning and scaling commands can result in content sent to the display 4 to be output in a stretched or a compressed format relative to the native resolution in which content the content is generated. The dual port control 103 can be configured to generate translation functions for the video input and for the touch screen output that interpolates the video input to fit within a designated display area and interpolates the touch screen output to account for positioning and scaling commands received from an external device. In alternate embodiments, the candle controller 31 can be configured to perform the translation functions.

The touch screen display 4 can be the main display the gaming machine 1 where video content associated with a wager-based game generated by the game controller 16 is displayed. The game controller 16 can be configured to output the video content in a native resolution, such as 640 by 480. The video content can include indications of locations where a touch detected by a touch screen can cause the game controller 16 to perform an action in response. For instance, in response to a detected touch, the game controller can change the video content output to the touch screen display 4.

In alternate embodiment, the touchscreen display can be a secondary display. For example, on a stepper machine, the main display can be a set of mechanical reels and the touchscreen display can be reside in front of or adjacent to the mechanical reels. The secondary display can receive video content from a game controller, such as video content including credit, wagering or bonus information. In some instances, the video content from the game controller can be output to only portion of the secondary display and in other instances all of the secondary display can be used to output the video content from the game controller.

In one embodiment, the touch screen display 4 can be a replacement display such that it replaces the display installed in the gaming machine during manufacture. When used as replacement display, the touch screen display 4 can have a resolution that is greater than the native resolution in which the video content output by the game controller 16 is

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generated. For instance, the touch screen display 4 can have resolution of 1280 by 960 while the native resolution of the content output by the game controller 16 is 640 by 480. When a display technology with a fixed pixel size, such as an LCD, is used as the replacement display, interpolation and/or smoothing can be utilized to scale the content output from the gaming controller 16 to fit the resolution size of the display.

As described above, the dual port controller 103 can be configured to receive sizing, positioning and scaling related commands. In one embodiment, only the candle controller 31 is configured to generate these sizing, positioning and scaling related commands and not the game controller 16. For instance, the candle controller 16 can be configured to select picture in a picture modes that allows the video content output from game controller 16 to be displayed on different portions of the touch screen display 4 at different resolutions where the native resolution output by the game controller 16 and sent to the touch screen display 4 is constant.

The sizing, scaling and positioning commands can be associated with picture-in-picture (PIP) capability of the display 4. Using the PIP capability, video content can be transmitted from the candle and displayed as a PIP mode on the display 4. In one embodiment, the video can be transmitted via a USB interface. In other embodiments, other video transmission technologies can be used, such as an HDMI protocol and compatible cable. Via the candle 2, the PIP capability can be used to output real-time or stored video content.

In one embodiment, the candle 2 can control the PIP independently from the game controller 16. Thus, the game controller 16 is not aware that the video content that it is outputting is affected by PIP commands issued by the candle 2 or that the candle 2 is sending control commands to the display 4. In another embodiment, the game controller 16 can transfer or allow control of the display by the candle 2. As an example, the game controller 16 can be configured to hand over control to the candle 2 to allow it to display a bonus game presentation on all or a portion of the touch screen display 4. Thus, game controller 16 can engage in bi-directional communications with the candle 2 to indicate when the display is available and the candle 2 can communicate when it is finished using the display. When the candle 2 indicates it has completed displaying the bonus game presentation, the game controller can reassume control of the display. When the game controller 16 controls the display, it may prevent the candle controller 31 from outputting content to the display 4. Further details of the control of the dual port touch screen display 4 coupled to a game controller 16 and a candle controller 31 are described below with respect to FIGS. 3, 3B and 4. Although not shown in the embodiments illustrated in FIGS. 3, 3B, and 4, it will be understood that the dual port touch screen display 4 can be coupled to a secondary processor in the cabinet of the gaming machine instead of to the candle controller 31.

Communication links, which can be wired or wireless, are shown between communication interfaces TITO (Ticket-In/Ticket-Out) 97, link progressive 98, WAP 99, and player tracking 100 and associated communication interfaces on the controller 31. In this example, the communication interfaces are associated with the controller 31. In general, a gaming machine deployed in the field can be configured to interface with one or more external systems where the number of systems varies from gaming machine to gaming machine. For instance, a first gaming machine can be configured to interface with a wide area progressive system,

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a player tracking system and a cashless system while a second gaming machine can be configured to communicate with only a cashless system. The candle 2 can include multiple ports to provide communication support for gaming machines configured to communicate with different numbers of external systems.

The controller 31 can be configured to provide the multiplexing of the data streams received from the gaming machine 1. The resultant data stream can then be encrypted and sent to one or more remote devices 90. Further, the candle 2 can be configured to receive communications from one or more remote devices where a portion of the communications is in an encrypted format and decrypt the encrypted portions of the communications. The decrypted data can be sent to the respective communication interfaces of the gaming machine 1, such as 97, 98, 99 and 100.

Power switching 50 can receive power via interface 110 and output power via interface 111. One or more of the game controller 16, the audio device 104, the display 4, the dual port printer 105, the dual port bill acceptor 106 and the player tracking unit 3 can be connected to the power switching 50. The power switching 50 can be controlled in response to commands received from the candle controller to interrupt power to the one or more devices connected to the power switching 50 as part of a power cycling event. In one embodiment, the candle controller 31 can be configured to cycle all of the devices on a gaming machine including or except for itself. A power cycling event may be initiated to clear an error condition on one of the devices. In one embodiment, the candle controller 31 can be configured to initiate the power cycling in response to a command received from one of the remote devices 90.

The dual-port bill acceptor 106 can be configured to read tickets (TITO) and paper currency and communicate this information on the first port, which is controlled by the regulated game program. JCM Global (Las Vegas, Nev.) is one example of a manufacturer that provides dual-port bill acceptors. The dual-port bill acceptor 106 can also be configured to read special promotional tickets and communicate this information on the second port to the candle 2. In addition, the dual-port bill acceptor 106 can provide cash and operational information to the casino operator on the second port to the candle 2. The controller 31 can be configured to send this information received from the bill acceptor to a remote device.

In one embodiment, the dual-port bill acceptor can be configured to perform electronic transactions involving a mobile device, such as 240. The electronic transactions can involve a mobile wallet application where the information received from the mobile device is used to initiate a transfer of funds to the gaming machine 1 from one of the remote devices 90. The candle controller 31 can be configured to provide communication services that allow the mobile wallet transaction to be processed. Further, the candle controller 31 can be configured to generate an interface on display 4 that allows data associated with the transaction to be input, output and verified.

The dual-port printer 105 can be configured to print tickets (TITO) provided by data on a first port, which is controlled by the regulated game program, or special promotional tickets provided by data on a second port. The promotional tickets can be customized and regularly updated. In one embodiment, the tickets can be personalized based upon an identification of a player at the gaming machine. In addition, the dual-port printer can be configured to provide operational information to the casino operator on

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a second port. FutureLogic (Glendale, Calif.) is one example of a manufacturer of dual port printers.

The audio channel on the dual port audio system 104 can be used to provide the ability to use the existing game machine audio speakers to provide voice and audio for the player that is not part of the game program. Further, the second port can be used to provide audio that is part of a bonus game presentation that is generated by the candle 2. In one embodiment, first audio content from the game controller can be mixed with second audio content from another source such that both the first and the second audio content are both output simultaneously. In another embodiment, the second audio content can replace the first audio content such that only the second audio content is heard.

The player tracking monitoring port can be used to provide non-intrusive monitoring of the player tracking data to provide player ID information for the casino operator. In one embodiment, this data can be utilized by the candle 2 to provide custom content to a player. For instance, the player ID data can be used to target a personalized promotional opportunity selected based upon known information about the player. The personalized promotional opportunity can include a custom ticket that is printed by the printer. The customized ticket can include custom graphics and player identification information, such as the player's name.

In particular embodiments, when a dual port device, such as the bill acceptor 106 includes regulated software, such as regulated firmware, the regulated software can be decoupled from other software on the peripheral device. The regulated portion of the software may govern interactions between the peripheral device and the game controller 16. Changing the regulated portion of the peripheral software typically requires a lengthy approval process.

The non-regulated portion may involve interactions that do not involve the game controller 16 and thus, a gaming control board may allow this portion of the software to be updated without regulatory approval or under a much less stringent approval process. In various embodiments, the unregulated or less regulated portion of the peripheral software can be updated via the controller 31. For instance, if a new fraud detection algorithm is needed, such as to detect a new type of counterfeit currency, then the new detection algorithm can be downloaded to the bill acceptor via the second port of the dual port bill acceptor. If necessary, the power on the dual port bill acceptor can be cycled to allow the bill acceptor to restart using the new software or firmware.

Next, methods and apparatus for generating the display interfaces on a gaming machine are described with respect to FIGS. 3A, 3B and 4. In a particular embodiment, a dual port touch screen display device described above with respect to FIG. 2 can be coupled to a game controller and a candle controller allowing the display to receive and to display simultaneously content from both the game controller and the candle controller. To provide a display interface, the candle controller can be configured to respond to touch screen data associated with selectable buttons (active areas) in the content output by the candle controller to the display as is described in more details as follows.

FIG. 3A is block diagram of a gaming machine 1 including a dual port touch screen display 4 communicatively coupled to a candle device 2. As described above, the game controller 16 can be configured via a first communication interface to send candle control commands 72 to the candle 2. In response to receiving the commands, the candle controller 31 can turn on or turn off various lighting elements on the candle. As described above, a combination of

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lighting elements that are lit on the candle can be used to convey information about the gaming machine **1**, such as an attendant is needed at the gaming machine. In addition, via a second communication interface, the candle controller **31** can be configured to monitor messages sent to or from the game controller **16** devices. In one embodiment, the candle controller **31** can be configured to communicate directly with the game controller **16** to request information **74**, such as accounting, player tracking information or information related to its current state.

The dual port touch screen display **4** can include a number of display modes that allow video content from the game controller **16** and the candle controller and/or another gaming device to be simultaneously output from the display **4**. Some examples of display modes are illustrated in FIG. 3B. In a particular embodiment, the touch screen display **4** can include at least two video inputs, **52** and **54**, for receiving video data. In one embodiment, the game controller **16** can be configured to send video content to the touch screen display **4** via the video input interface **52** and the candle controller **31** can be configured to send video output to the touch screen display **4** via the video input interface **54**.

The touch screen display **4** can be EST model manufactured by Digitech Systems co. LTD (Korea). Examples of screen sizes include 15, 17, 19 and 23 inch models. The controller **60** can also be provided by Digitech Systems (e.g., a DTC-01N or the DTC-02S-02). The controller **60** can support a proprietary serial communication protocol, such as Netplex or an open protocol, such as USB.

In particular embodiments, the first video input interface **52** can be a VGA or DVI compatible interface. As examples, resolution from about 640×480 up to 1920×1080 can supported. The 1920×1080 can support an HD signal. The aspect ratios of the input from the game controller can be one of 4:3, 16:9, 16:10 and 5:4. The second input interface **54** can also be a VGA or DVI compatible interface. For instance, the candle controller **31** can provide a DVI signal at 1280×1024 resolution.

The touch screen display **4** has a native resolution, such as U by V pixels. For instance, the resolution of the touch screen display **4** can be about 1280 by 960 pixels where U=1280 and V=960. The touch screen display **4** can include a controller **60** that is configured to receive commands that allocate a portion of the display **4** to video content provided from the game controller **16** and video content provided by the candle controller **31**. In FIG. 3A, the portion of the display **4** allocated to content from the game controller **16** is referred to the game portion **76** and the portion of the display **4** allocated to content from the candle controller **31** is referred to as the candle portion **78**.

The content output to the display by the game controller **16**, the candle controller **31** and/or another gaming device can include active areas where a touch input detected by the touch screen can result in response by the game controller **16** or the candle controller **31**. The game controller **16** can be configured to receive touchscreen output **70a** from a controller **60** associated with the display **4**. Based upon the touchscreen output **70a** received from controller **60**, the game controller **16** can determine whether any active areas of the touch screen have been selected. The candle controller **31** can also be configured to receive touch screen output **70b** from the controller **60**. Based upon the touch screen output **70b**, the candle controller **16** can determine whether any active areas of the touch screen have been selected.

In one embodiment, the video input, touch screen output and control commands **68** can be communicated via separate interfaces. For instance, video content from the controller **31**

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can be sent to the display **4** via a first interface, such as **54**, control commands **68** can be sent to the display **4** via a second interface and touch screen output can be sent to the controller **31** via a third interface. In other embodiment, a common interface can be used to communicate video content, control commands and touch screen output between a particular device, such as the game controller **16** and the candle controller **31**, and the display **4**. For instance, a first USB interface can be used to communicate video content, control commands **68** and touch screen output **70b** between the controller **31** and the display **4**.

In particular embodiments, the display **4** can utilize a display technology, such as a LCD technology, where a pixel size associated with the display is fixed. The native resolution of a LCD, LCoS or other flat panel display refers to its single fixed resolution. As an LCD display consists of a fixed raster, it cannot change resolution to match the signal being displayed as a CRT monitor can. Thus, optimal display quality can be reached only when the signal input matches the native resolution of the display **4**. An image where the number of pixels is the same as in the image source and where the pixels are perfectly aligned to the pixels in the source is said to be pixel perfect. For instance, a 640×480 image mapped to a 640×480 portion of an LCD can be considered pixel perfect.

When the signal input doesn't match the native resolution of the display interpolation is used. Interpolation (scaling of the image) causes a loss of image quality. When the resolution of the video content received by the display **4** is smaller than the native resolution of the display it can be scaled up. When the resolution of the video content received by the display is larger than the native resolution of the display it can be scaled down. In one embodiment, the interpolation can be performed by the video scaling **56** in the controller **60**. In another embodiment, the candle controller **31** can be configured to receive video content from the game controller **16**, scale it to fit a resolution on the display to which it is to be output and then send the scaled video content to the display **4**.

The display **4** can include a controller **60** configured to receive control commands that affect a size and a position of the game portion **76** and the candle portion **78**. In a particular embodiment, only the candle controller **31** and not the game controller **16** is configured to generate and send control commands **68** to the controller **60** that affect the size and the position of the game portion **76** and the candle portion **78**. In one embodiment, the display **4** can be configured to only receive control commands from one device. In the candle controller **31**, the display control **62** can be configured to determine the size and the position of the game portion **76** and the size and the position of the candle portion **78**. Unless a size selected for the game portion **76** is pixel perfect, the size of the game portion **76** selected by the candle controller **31** can affect how the video content from the game controller **16** is interpolated onto the display **4** and hence, a quality of the subsequent image that is displayed.

The image quality that is displayed after interpolation on the display **4** can be affected by the resolution of the video content generated by the game controller **16** and the size of the game portion **76** selected by the candle controller **31** where some sizes selected for the game portion **76** can produce better interpolation results and hence, a higher output image quality than other sizes. In particular embodiments, the candle controller **31** can be configured to determine the resolution of the video content output from the game controller **16** and select a size for the game portion **76** to produce better interpolation results.

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In various embodiments, the candle controller 31 can determine the resolution of the video content output from the game controller 16 in a number of different manners. For instance, it can retrieve the information from a memory location on the candle controller 31 where it was previously stored, it can request the information directly from the game controller 16 or it can request the information from a remote server. The candle controller 31 may receive information from the game controller 16 and/or a remote server, such as information that identifies the model of the gaming machine 1, which allows the candle to determine the resolution of the video content generated by the game controller 16. Based upon the determined resolution of the content output by the game controller 16, the candle controller 31 can determine parameters for scaling up and/or down the content on the display 4.

The touch screen display 4 can be configured to generate different a number of different display modes that affect a size of the game portion 76 and the candle portion 78. As described above, in one embodiment, only the candle controller 31 can be configured to provide commands that select a display mode to utilize on the display 4. As examples, the display 4 can be configured to provide all or a portion of the display modes 80a-80m illustrated in FIG. 3B where the candle controller 31 determines which of these display modes to use at a particular time. These display modes are described as follows.

In display mode 80a, all of the display 4 is allocated to the game portion 76 whereas in display mode 80m, all of the display 4 can be allocated to the candle portion 78. In display mode 80b, a top portion of the display 4 is allocated to the game portion 76 and a bottom horizontal strip is dedicated to the candle portion 78. In 80c, a top horizontal strip is allocated to the candle portion 78 and a bottom portion is allocated to the game portion 78. In 80d, a top and a bottom horizontal strip are allocated to the candle portion 78 and a center portion is allocated to the game portion 76. In 80h a left vertical strip is allocated to the candle portion 78 and the remaining portion is the game portion 76. In 80i, a right vertical strip is allocated to candle portion 78 and the remaining portion is the game portion 86. In 80j, left and right vertical strips are allocated to the candle portion 78 and the center portion is allocated to the game portion 76.

The candle controller can be configured to select a thickness for the left and/or right vertical strips or the top and/or bottom horizontal strips. In one embodiment, when two or more strips are selected, such as a top and a bottom horizontal strip, the candle controller 31 can select the strips to be of the same thickness (horizontal strip) or width (vertical strip). In another embodiment, the candle controller 31 can select the thickness/width of the strips to be different sizes.

In 80e, a top and a bottom horizontal strip and a left vertical strip are allocated to the candle portion 78 and remaining portion is allocated to the game portion. In 80f, a top and a bottom strip and a right vertical strip are allocated to the candle portion 78 and the remaining portion is allocated to the game portion. In 80k, a left and a right vertical strip and a top horizontal strip are allocated to the candle portion 78 and a remaining portion is allocated to the game portion 76. In 80l, a left and right vertical strip and a bottom horizontal strip are allocated to the candle portion 78 and a remaining portion is allocated to the game portion 76. In 80g, a top and bottom horizontal strip and a left and right vertical strip are allocated to the candle portion 78 and a center portion is allocated to the gaming portion.

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In 80m, the candle portion 78 is rectangular and allocated the entire display such that none of the video content from the game controller 16 is visible on display 4. In alternate embodiments, a smaller rectangle can be used for the candle portion 78 such that the game portion 76 is only partially obscured by the candle portion. A disadvantage of this approach is that the candle portion 78 needs to be positioned and placed such that it doesn't obscure any important information associated with the game portion 76 such as the outcome of a wager-based game displayed in the game portion 76. Thus, using this type of picture in a picture mode, the candle controller 31 may need to determine at any given time the content that is displayed in the game portion 76 to avoid obscuring it with an overlapping candle portion 78.

In one embodiment, the candle controller 31 can be configured to utilize only display modes that never overlap and obscure the game portion 76. For instance, the candle controller 31 can be configured to utilize display modes 80a-80l in FIG. 3B where the game portion 76 is rectangles of different sizes. The video content associated with the game portion 76 can be scaled to fit the different size rectangles but is never partially covered by the candle portion 78. Further, the candle controller 31 can select the scaling parameters such that the content displayed in the game portion 76 is an acceptable quality after scaling to allow information associated with the content, such as a game outcome, to be adequately displayed to a player. An advantage of this approach is that the candle controller 31 doesn't have to determine the current content of the game portion 76 when selecting a display mode that allows video content associated with the candle portion to be displayed, such as display modes 80b-80l.

As described above, the touch screen display 4 can be a retrofit display that replaces the original display that was installed during manufacture of the gaming machine where the touch screen display 4 can have a different resolution than the resolution of the video content generated by the game controller 16. For example, the resolution of the video content can be 640x480 while the resolution of the replacement display can be 1280x960. In a particular embodiment, the resolution of the replacement display can be larger than the resolution of the video content and the candle controller 31 can be configured to select a display mode where the resolution of the game portion 76 for the display is always greater than or equal to the resolution of the video content generated by the game controller 16. Thus, the content is displayed pixel perfect or in a scaled up format. For instance, if the resolution of the video content generated by the game controller is 640x480 then the minimum U dimension selected by the candle controller 31 is greater than or equal to 640 and the minimum V dimension selected by the candle controller 31 is greater than or equal to 480. In one embodiment, the candle controller can be configured to only select a picture perfect (no scaling) for the content from the game controller 16.

When the U and V dimensions are selected as described in the previous paragraph, the video content generated by the game controller 31 can be stretched (interpolated) in the U, V or both U and V directions when it is displayed in the game portion 76. However, the video content generated by the game controller 31 is never shrunk below the resolution output by the game controller 31 in the U and V directions. It may not be desirable to scale down the video content generated by the game controller 31 below the resolution in which it is output from the game controller 16 because shrinking causes data to be removed from the image and hence information to be lost.

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Returning to FIG. 3A, the game controller 16 can include software 50 for generating the video content sent to the display 4. In one embodiment, the output resolution of the software 50 can be fixed such that video content with the same resolution is sent independent of the size of the game portion 76 selected by the candle controller 31. The video content which is sent from the candle controller 31 to the display 4 can be generated by the video software 64. In particular embodiments, the candle controller 31 can be configured to generate video content with different resolutions depending on a size and a format of the candle portion 78 selected by the candle controller. For instance, the candle controller 31 can be configured to select a size of the candle portion 78 and then generate content that is pixel perfect with the size of the candle portion.

In one embodiment, the candle controller 31 can be configured with a maximum resolution for the content output. For instance, the maximum dimension of a strip can be 120×1024. The candle controller 31 can select a strip with smaller dimensions, 60×1024. However, the candle controller will not select a strip with larger dimensions, such as 150×1024. When the smaller dimensions are selected, the content sent to the display 4 will be the maximum resolution, such as 120×1024. After receiving the content, controller 60 can be configured to scale down the content to a smaller resolution, such as 60×1024.

In one embodiment, the candle 2 can receive video signals 72 including audio from a remote device. For instance, the video signals can be associated with a live sports event or live broadcast television. In addition, the video signals can be associated with pre-recorded content, such as previously aired television shows, theater movies, music videos or Internet content (e.g., YouTube videos). The video software 64 can be configured to integrate video signals from one or more video feeds into the video content output in the candle portion 78.

Sounds can be associated with the video content output from the candle controller 31. For instance, a video feed for a live sporting event displayed in the candle portion 31 can include commentary associated with the sporting event. The sound control 65 associated with the candle controller 31 can be configured to output the sounds associated with the video content. In one embodiment, the sounds can be output via an audio device, such as a speaker associated with the candle 2. In another embodiment, the sounds can be output via an audio device associated with a gaming machine, such as a dual port audio device. In yet another embodiment, the candle 2 can be configured to output the sounds via a device carried by a player such as a Bluetooth™ headset or via headphones coupled by wire to an audio output jack on their cell phone. In one embodiment, the controller 31 can generate an interface in the candle portion 78 that allows a player to choose a method for outputting sounds associated with the video content from the controller 31, change the volume of the sound and/or mute the sound.

As described above, the video content associated with the game controller 16 and the candle controller 31 can include a number of active areas where in response to touch screen input received in the active areas, the game controller 16 or the candle controller 31 can generate a response. The touch input associated with an active area is received when the touch screen is activated above a location where the active area is output on the display 4. To respond properly to a touch, the active areas displayed in the video content need to be mapped to corresponding locations on the touch screen, i.e., the receiving devices determines that a touch

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input received at a particular location and detected by the touch sensor corresponds to an active area displayed at the location on the display 4.

Typically, the game controller 16 will expect to receive touch screen output that corresponds to a game portion 76 filling the entire display screen (e.g., display mode 80a). The game controller 16 may not be aware of changes in size and position of the game portion on display 4 that can affect the locations where the touch sensor detects input for a particular active area that is output to the display 4. Thus, when the video content associated with the game portion 76 is output in window size and with a location different from a full screen mode, the touch screen output 70a sent to the game controller 16 may no longer match the locations of active areas expected by the game controller 16. To account for changes in position and size of the game portion, a transformation operation can be performed that interpolates the input received by the touch screen on display 4 for a particular size and position of the game portion to an input expected by the game controller 16. These transformation operations are discussed in more detail in the following paragraphs.

The controller 60 can be configured to scale the touch screen output 70a sent to the game controller 16. For instance, the candle controller 31 can be configured to provide a resolution of the video input 52 from the game controller 16 and a resolution of the game portion 76 to the controller 60 where the resolution of the game portion 76 can be different from the resolution of the video content from the game controller 16. Using this input, the controller 60 can be configured to interpolate the touch screen results to match the resolution of the video content of the game controller 16. As an example, the resolution of the game portion 76 can be 960×720 and the resolution of the video content from the game controller 16 can be 640×480 and the controller 60 can be configured to scale touch inputs received in the 960×720 game portion 76 to the 640×480 size. After scaling, the touch screen output 70a can be sent to the game controller 16 in the 640×480 size. As shown in FIG. 7B, the game portion 76 can be positioned at different locations on the display 4. The controller 60 can be configured to account for the position of the display portion 76 when performing the scaling. For instance, the game controller 16 can expect the touch screen input to start in the lower left hand corner of the display 4 and the controller 60 can be configured to scale the touch screen output so that it appears to start from this location. In alternate embodiments, the candle 2 can be configured to perform this scaling and then send the scaled results to the game controller 31.

In one embodiment, the candle 2 can be configured to receive the touch screen output 70b for the entire display including the game portion 76 and the candle portion 78 while the game controller 16 only receives the touch screen output 70 from the game portion 76 scaled to the resolution of the video content from the game controller 16. The candle controller 31 can be configured to determine if any of the touch screen input corresponds to active areas associated with video content generated and output to the display in the candle portion 78. When candle controller 31 detects that a location on the touch screen sensor has been activated that corresponds to an active area in the video content generated by the candle controller 31, the candle controller can perform an action in response. For instance, in response to detecting touch sensor data that corresponds to an active area, the candle controller 31 can generate new video content in the candle portion 78 and/or rearrange the content in the candle portion 78.

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In particular embodiments, the candle 2 can be configured to save and/or send touch input associated with the game portion 76 to a remote device. The touch input associated with the game portion 76 can be in the scaled or non-scaled format. The remote device can be configured to determine whether the touch screen input is associated with any active areas generated by the display when the touch screen data was received. To make this determination, the candle 2 can also be configured to send information related to a state of the wager-based game generated by the game controller 16 to the remote device, such as whether the gaming machine is in an idle state, displaying an outcome to a game, between games or in a bonus state. Further, the candle 2 can be configured to send to the remote device information regarding details of the game output by the game controller, such as a particular version of a video slot game by a particular manufacturer. The state information can be used by the remote device to determine what content is associated with the touch input and whether any active areas have been selected.

In response to determining an active area has been selected in the game portion, the remote device can send commands to the candle that cause the candle controller 31 to alter the content output to the candle portion 78. For instance, in response to detecting a see pays button being activated in the game portion 76, the remote device can be configured to send commands to the candle controller 31 to output additional video content in the candle portion 78 for a supplementary bonus game generated by the candle controller 31. In another embodiment, when remote device determines a selection of a particular symbol in a bonus game generated by the game controller 31 has been selected, the remote device can send commands to alter the content displayed in the candle portion 78. For instance, in response to detecting the selection, the remote device can command the candle controller 31 to output video content associated with a supplementary bonus game that can include an additional award being provided to the player that is separate from the award associated with the bonus game generated by the game controller 16.

In another example, the remote device can command the candle controller 31 to generate a bonus presentation that augments the bonus presentation provided by the game controller 16. The supplementary bonus game presentation generated by the candle controller 31 can include time relevant information. For instance, if the bonus game from the game controller is triggered during a super bowl weekend or Saint Patrick's Day, then the bonus game from the candle controller 31 can include a super bowl theme or a Saint Patrick's Day theme that complements the bonus game output by the game controller 31.

In alternate embodiments, the functions performed by the remote device can be performed by the candle controller 31. Thus, the candle controller 31 may not have to send the touch screen output associated with the game portion 76 to the remote device. For instance, the candle controller 31 can be configured to determine that a bonus game has been triggered, is displayed in the game portion 76 and that a particular symbol selection associated with the bonus game has been made. In response to the determination, the candle controller 31 can be configured to generate and output a supplementary bonus game presentation to the candle portion 78.

In one embodiment, the touch screen display can support a multi-touch capability. For instance, the controller can be configured to detect and report two touch inputs on the touch screen moving towards one another or moving away from

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one another. The candle controller 31 can be configured to respond to the multi-touch output. For instance, in response to the detection of two touch inputs moving together, the candle controller 31 can be configured to reduce the size of or close the candle portion 78 or close a menu in the candle portion. Whereas, in response to the detection of two touch inputs moving away from one another, the candle controller 31 can be configured to open the candle portion 78 or open/expand a menu in the candle portion.

Next with respect to FIG. 4, a method 300 for a candle device to control a dual port touch screen display is described. As described with respect to FIG. 3A, the dual port touch screen display can be coupled to both a game controller on a gaming machine and a candle controller in the candle device. The candle controller can be configured to control a display mode associated with the touch screen display that affects the size and location of where content generated by the game controller and content generated by the candle controller is output to the touch screen display.

In 302, the candle controller can be configured to determine the resolution of a gaming machine's video output to a first port of a dual port touch screen display. The candle controller can be coupled to a second port of the dual port touch screen display. In 304, the candle controller can determine a candle-controlled display interface is triggered. In 306, in response to detecting the display interface is triggered, the candle controller can be configured to determine a state of the EGM.

In one embodiment, the state of the EGM can affect whether the display interface is generated on the touch screen display. The candle controller can be configured to not generate a display interface during certain states of the EGM, such as when the outcome presentation to a wager-based game is being dynamically output to the touch screen display. For instance, if the video reels for a video slot game are currently being output as spinning on the display, the candle controller can be configured to wait until the presentation is complete (i.e., the reels stop spinning) before generating the triggered display interface.

In another embodiment, in 308, the state of the EGM can be used by the candle controller or a remote device to determine whether a touch screen input, in area where the game content from the game controller is being output, is associated with an active area of the game content. The active area of the game content can be related to such functions as displaying the "pays" associated with the game, initiating a game, making game decisions (e.g. holding particular cards) or making a choice associated with a bonus game (e.g., selecting or more bonus symbols from among a number of bonus symbols that are displayed).

In response to determining the touch screen input is associated with an active area, the candle controller can be configured to perform a supplementary action that can affect the content output to the display from the candle controller. For instance, when it is determined one or more particular cards have been held in a card game output by the game controller, the candle controller can be configured to output a supplementary bonus game to the touch screen display or provide the opportunity for a side bet based on the held cards. The game controller responds to the touch input as it normally does and is not affected by the supplementary response performed by the candle controller. For instance, if the game controller determines that a see pays button has been selected, the game controller can generate a see pays screen which is output to the display. As another example, if the game controller determines that particular cards have been held in a card game, the game controller will proceed

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with normal play of the game independently of whether or not the candle controller, in response to certain cards being held, generates and outputs content related to a side bet or a supplementary bonus game.

In **310**, the candle controller can be configured to determine a size and location for displaying the EGM video output and a size and a location for a candle-controlled display interface on the dual port touch screen. As describe above, the determination can involve selecting a display mode including a game portion and a candle portion for the touch screen display. The size of the game portion can be selected to preserve a display quality of the game content. For instance, the size of the game portion can be selected to be pixel perfect or a non-pixel perfect size can be selected that produces good interpolation results.

In **312**, the candle controller can determine the content and the layout of the content that is to be output to the touch screen display in the candle portion. The content can include a number of active areas that when selected via touch screen sensor associated with the display can cause the candle controller to perform an action, such as change the content associated with the candle portion. The candle controller can determine a touch screen mapping that associates the active areas output to the display with locations of touch screen data that will cause the candle controller to respond. The touch screen mapping may change depending on the content currently displayed in the candle portion and the display mode selected for the candle portion.

In **314**, the candle controller can generate the content for candle-controlled display interface. The candle controller can be configured to generate content with different resolutions depending on a size selected for the candle portion. In one embodiment, a maximum resolution for the candle content can be selected where the candle controller is configured to select a display resolution that is equal to or less than the maximum resolution. The maximum resolution content can be utilized for all the display resolutions selected by the candle controller. In the case where the display resolution is smaller than the resolution of the candle content, the candle content can be scaled down to fit the display resolution.

The candle controller can be configured to save to a memory portions of the candle content and/or parameters used to generate the content that are output at any particular time. In addition, information relating to the context in which the content was generated can be stored. For instance, a time at which particular candle content was output, a display mode to which the candle content was output and a state of the game when the candle content was generated can be output. In one embodiment, the saved candle content and/or parameters used to generate the content can be used for auditing or dispute resolution purposes.

In **316**, the candle controller can send control commands to the touch screen display. The control commands can affect a size and position of where content from the game controller and content from the candle controller is to be displayed to the touch screen display. In addition, the display parameters can affect a scaling of touch screen data received from the touch screen sensor. The scaling can affect how touch screen data is returned to the game controller. In one embodiment, the resolution of the content output by the game controller and sent to the display can be constant for any of the combination of display parameters selected by the candle controller. Thus, at a first time the candle controller can select a game portion of a first size and at a second time the candle controller can select a game portion of a second size for displaying the game content where at each time the

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resolution of the game content generated by the game controller is the same. In **316**, the candle controller can also send content for a candle portion to the touch screen display.

In **318**, the candle controller can receive touch screen responses associated with both game portion and the candle portion where game content and candle content are each respectively displayed in the game portion and the candle portion. In one embodiment, the candle controller can be configured to determine whether only touch screen input associated with active areas of the candle content have been received. When the candle controller determines that an active area associated with the candle content has been selected in **320** the candle controller can respond. One response is to change the content output in the candle portion. In another embodiment, the candle controller can determine that an active area associated with the game content has been selected and in response change the content output in the candle portion. The candle controller can be configured to save touch screen data associated with only candle portion or both the candle portion and the game portion, such as a location on the touch screen where a touch screen input has been detected and a time that the touch screen input was detected.

In a particular embodiment, verification of electronic transactions involving a transfer of funds to the gaming from a remote account is provided. The funds transfer can be initiated from a portable electronic device, such as a smart phone or a table computer. A candle device can be configured to generate a verification interface using a display of the gaming machine. Alternatively, a secondary processor within the cabinet of the gaming machine can be configured to generate the verification interface. The verification interface can allow a player to enter verification information that can be used to validate the transaction. Further, the verification interface can be used to indicate a status of the transaction, such as whether it is being authorized, has been approved or has been rejected.

FIG. 5 is a diagram that illustrates a gaming system including gaming machines that wirelessly communicate with servers in accordance with the described embodiments. In one embodiment, the gaming system can include one or more gaming machines, such as **1a** and **1b**. The gaming machines can be different models and types supplied by different gaming machine manufacturers. The gaming machines can each be equipped with candle device, such as **2a** and **2b**. In one embodiment, the candle devices can be coupled to a dual port touch screen display on the gaming machines **1a** and **1b**. The candle devices, **2a** and **2b**, can be configured to generate on the touch screen display devices an interface for verifying a transaction.

In one embodiment, a wireless radio can be located within a candle, such as **2a** or **2b**. In another embodiment, a wireless radio, such as **18**, can be located separate from the candle. In FIG. 5, the wireless radio is mounted between the candle **2a** and the exterior of the EGM cabinet on an exterior portion of the EGM. In other embodiments, the wireless radio can be mounted within an interior or exterior portion of the EGM. In one embodiment, an antenna for the wireless radio can be configured to point toward the ceiling to interface with wireless access points pointing downwards. This configuration of wireless radio and access point can help to minimize interference.

The candle devices **2a** and **2b** can be configured for wireless communications. Alternatively the cabinet of the gaming machine **1** can be configured with one or more antennas for wireless communications. Using the wireless capabilities, a gaming network **102** can be provided. Via the

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gaming network **102**, the wirelessly enabled gaming machine **1** can communicate with a system controller **101**, such as via wireless communications **110**. The system controller **101** can transmit and receive data from the gaming network **102**. In one embodiment, the system controller **101** can be configured to de-multiplex/de-encrypt the data stream from the gaming machines equipped with wireless capabilities and send the resultant data streams to the respective gaming system servers to which particular wireless communications are addressed.

In particular embodiments, wireless access points can be provided that allow a portable electronic device, such as **109**, to communicate with other gaming devices in the wireless gaming network. For instance, via a Bluetooth™ interface in the candles **2a** or **2b**, a portable electronic device can be allowed to communicate with a casino server, such as **120**. As another example, Wi-Fi access points can be distributed throughout a gaming environment, such as a casino, which allow communications with a casino server. In one embodiment, the casino server can support a hospitality application executing on the portable electronic device. For instance, MGM resorts International™ provides an “M life” players club application that can be executed on a player’s portable electronic device, such as **109**.

In another example, the gaming machines, such as **1a** and **1b**, can include other devices capable of communicating with a portable electronic device. For example, a gaming machine can include a secondary device, such as a bill validator, which is configured to receive account information that enables electronic cash transaction from a portable electronic device. In one embodiment, the portable electronic device can include an NFC (Near field Communication) interface that can communicate account information via a NFC interface on the gaming machine, such as an NFC interface on a bill validator. As an example, the portable electronic device can execute an electronic wallet application that supports electronic purchases via an NFC interaction like PayPass™ by MasterCard™. The electronic wallet application can be used to initiate a transfer of funds that allows credits to be deposited onto the gaming machines.

After a device, such as the bill validator receives information via the NFC interaction, the bill validator can be configured to send the information to the candle device. The information can include an account identifier from which the funds are to be transferred. In response, the candle device can be configured to generate a verification interface that allows transaction validation information associated with the account to be entered. Further, the candle device can be configured capture an image of the person that is requesting the transaction.

Typically, it is not possible to provide an interface for entering verification data via the bill validator because the bill validator is only afforded a small area on the outer surface of the gaming machine. Typically, a small slot, a surrounding bezel and a landing area for placing bills or tickets are all that is provided. However, a candle device upon receiving an indication of a transaction from a secondary device, such as bill validator, can be configured to generate a display interface on a touch screen display associated with the gaming machine. The candle controller can output content to the display interface and respond to touch inputs received via the display interface in a manner that allows verification information associated with the transaction to be received and a status of the transaction to be displayed to a player. As described above, the candle can generate the display interface without the participation of the game controller.

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Next, after receiving information via the verification interface, the candle **2** can send the account identification received from the bill validator and the verification information received via the verification interface to a casino server. The casino server can include account information that allows the server to determine if the verification information received from the candle device matches the verification information associated with the account. If necessary, the casino server can be configured to contact other remote devices via outside interface and request account verification where the request includes verification information entered via the display interface generated by the candle. In response, the remote devices can determine whether the verification information is valid or not and communicate the validity of the transaction to the casino server. Then, the casino server can notify the bill validator, via the candle whether the transaction is valid or not.

In one embodiment, the casino server can include an alternate communication mode associated with the account, such as an e-mail address. The candle, such as **2a** or **2b**, or other secondary processor can be configured to send biometric information about the person requesting the transaction, such as a captured image of the person to the server. In response to receiving the biometric information, the server can be configured to send a message including the biometric information (e.g., the captured image of the person requesting the transaction via) the alternate communication mode. For instance, the message might indicate that a transaction associated with the account has been performed by the person in the captured image. If an authorized person is performing the transaction, then the message receiver can respond back to the server. In response to receiving the indication that the transaction is not valid, the server may freeze the account and send the captured image to security. Then, if the person in the image attempts another transaction, security can be notified and the person can be identified by the captured image data from the previous transaction.

Other examples of servers that can receive data streams from the system controller **101** include but are not limited to the player tracking server **24**, the WAP (Wide Area Progressive) server **25**, link progressive server **26** and the TITO (Ticket-in/Ticket-out) server **27**. These servers can communicate with one or more of the gaming machines by routing communications through the system controller **101**.

A few other examples of servers that can be coupled to the wireless gaming network **102** via the system controller **101** can include servers in other gaming establishments, servers associated with gaming regulators, third-party servers, servers providing game downloads and peripheral software updates, security server, servers providing hotel hospitality, travel, weather and lodging information and outside access to servers via the Internet. As an example of a server in another gaming establishment, the system controller **101** can be configured to contact a remote TITO server in another gaming establishment to validate a printed ticket remotely issued outside of the gaming establishment in which the system controller is located and forward the validation information to a gaming machine. As an example of a communication with a gaming regulator, the system controller **101** can be configured to communicate with a gaming regulator to notify the regulator of a regulated change to a gaming machine, such as a change in regulated gaming software on the gaming machine.

Gaming operators can allow third-parties affiliated with a gaming establishment to provide promotional opportunities to players on gaming machines. The system controller **101** can be configured to communicate with a gaming machine

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to provide a third party promotional opportunity. As an example, via the system controller **101** and the wireless gaming network **102**, a ticket can be printed at the gaming machine that allows a discount on a merchandise item or a service provided by the third party. In some embodiments, the tickets can be customized using a format selected by the third party and approved by the gaming operator.

The system controller **101** can be configured to allow a remote server to communicate regulated or unregulated gaming software to a gaming device. Regulated gaming software typically includes logic related to generating a wager-based game on the gaming machine, such as determining an outcome and an associated award. An example of unregulated gaming software may include firmware used by a peripheral device, such as firmware used by a bill validator or printer to report information used for health monitoring, firmware used by a bill validator to detect fraudulent currency or firmware used by a printer to print customized tickets. If the bill validator accepts a bill or an instrument that is later determined to be counterfeit, then new software can be downloaded to the bill validator to detect other bills or instruments with similar characteristics so that additional counterfeit bills or instruments are not accepted. The system controller **101** can also be configured to transmit and receive verification information that allows a remote server to verify that authentic software has been installed on a gaming device, such as gaming machine.

Each gaming machine can be connected to a different combination of gaming system servers, such as but not limited to a player tracking server **24**, WAP server **25**, link progressive server **26**, and the TITO Server **27**. For instance, a first gaming machine can be connected to only the casino back-room server **107** while a second gaming machine can be connected to the player tracking sever **24** and the TITO server **27**. The system controller **101** can be configured to allow different gaming machines to receive different data streams depending on a current server connection configuration. A current connection configuration for a particular gaming machine, such as adding a new connection to a server or removing a current connection to a server can be implemented via operator communications with the system controller **101**.

The system controller **101** can be configured to provide the multiplexing of the data streams from the gaming system servers and then encrypt the resultant data stream before transmitting. The data streams can be encrypted to prevent tampering and misuse of any data sent in the data streams. The wireless gaming network **102** may use one or more common wireless technologies such as Zigbee, 802.11 a/b/g/n, and 3G/4G. Also, optical transmission technologies, such as IR and laser, can be utilized alone or in combination with other transmission technologies. In other embodiments, power-line transmission technologies or other wired communication technologies can also be utilized alone or in combination with one or more different wireless technologies as part of a gaming network.

Existing gaming systems typically use some form of a protocol stack. There are standard gaming protocols, such as S2S, G2S developed by the Gaming Standards Association (GSA) and SAS developed by IGT as well as many other proprietary protocols used in the gaming industry. The protocols are used by gaming systems, such as a player tracking system or a TITO system, to communicate data between the gaming machine and servers across a network. The gaming systems may also use encryption to protect data in transit. All of the gaming system's protocols and encryption techniques must be tested and approved by a gaming

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test lab and/or gaming control board to operate in their jurisdictions. In order to maintain integrity and security it is important not to tamper with or change the data streams of these gaming systems. The gaming system including the system controller **101**, the wireless network **102** and candle devices **2a** and **2b**, can be configured to provide a non-intrusive technique to transmit and receive the data provided by these various systems, i.e., without a modification to an existing protocol that would require additional testing and approval.

In yet another embodiment, a back room server **107** and a gaming table **108** can be added to the system. The back room server **107** can be used to provide some of the real time changes to the entertainment, informational and promotional opportunities available on a gaming machine, such as **1**, or on a gaming table, such as **108**. For instance, promotional tickets can be printed at gaming tables and gaming machines in a dynamic manner using the back room server **107**. As another example, tournaments or other group games can be provided using the back room server **107**.

Next, further details of transaction verification using a display interface generated by a candle device are described. FIG. **6** is a flow chart of a method **500** for verifying transactions using a secondary processor, whether in a candle device or in the cabinet of a gaming machine. In **502**, the secondary processor can receive transactional information from a peripheral device. The transactional information can be included in a request to verify a transaction associated with the transactional information. The transactional information can be sent via a communication pathway that by-passes the game controller. Thus, this verification process can be transparent to the game controller.

For instance, a bill validator on a gaming machine can receive transactional information from a smart phone. The transactional information can include an account identifier and a request to withdraw a particular amount of funds from the account associated with the account identifier and convert the funds to credits on the gaming machine. In one embodiment, the bill validator can request the candle device to provide an interface for entering verification information associated with the transaction. The bill validator can be a dual port bill validator that communicates with the game controller through a first port and the candle device through a second port where each port is coupled to a separate communication channel. The communications through the second port between the bill validator and the candle device can by-pass the game controller.

In **504**, the secondary processor can generate a transaction interface on the main touch screen display of the gaming machine. While the transaction interface is being generated, the game controller is also outputting game content to the display as well. The generation of the transaction interface can include determining a size and a position of a window for outputting the game content and a size and a position of a window for outputting the content associated with the transaction interface. After the determination, control commands can be sent to the display from the secondary processor relating to the windows. Prior to the control commands, the game content can be displayed in a first window of a first size on the display, such as the entire display, after the control commands, the game content be displayed in a second window of a second size on the display that is smaller than full size.

The video content for the transaction interface can include a number of buttons that indicate locations where a touch can be made to enter information. For instance, key board buttons can be displayed to enter letters and buttons with

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numbers can be displayed to enter letters. One or more numbers, letters (upper and/or lower case), symbols (e.g., exclamation point or question mark) and combinations thereof can be entered when touches are detected at locations on the touch screen corresponding to the locations of the buttons output to the display. The information that is entered can be used to validate a transaction. For instance, a PIN can be entered and then compared to a PIN associated with an account before a transfer of funds from the account is authorized.

In **506**, the secondary processor can receive touch inputs from the touch sensor and determine whether the touch inputs correspond to particular input buttons that are displayed. When the touch input is determined to be associated with an input button then the secondary processor can be configured to change the video content output to the display associated with the interface and/or output a sound to an audio device. For instance, when selected, a color of a touch button may change and/or clicking noise can be output from the audio device, such as a speaker coupled to the candle device.

In **508**, the secondary processor can be configured to gather biometric information of the person requesting the transaction. In one embodiment, an image capture device can capture an image of the person requesting the transaction. In one embodiment, the biometric information that has been gathered can be output. For instance, an image of the person requesting the transaction captured via the camera on the candle device can be output to the main display.

In **510**, the secondary processor can send to the remote server the transactional information, such as an amount of funds and the account from which to withdraw the funds. The transaction information can be received from a secondary device, such as a bill validator. The bill validator may have received the transaction via an NFC enabled communication between the bill validator and a portable electronic device. In addition, the secondary processor can send the input entered via the transactional interface, such as a PIN or a password including numbers, letters, symbols or combinations thereof and optionally biometric information to the remote server. In the message including the data, the candle device can request the remote device to validate the transaction based upon the information that the secondary processor sends to the remote device.

In one embodiment, the remote device can store account information for a casino account. A player may have previously established and deposited funds into the casino account. The player can carry an account identifier for the account on their portable electronic device which can be read wirelessly from a secondary device, such as the bill validator. Via an interface on their portable electronic device or the verification amount generated by the candle, the player can request an amount of funds to transfer from the account to the gaming machine. An advantage of transferring funds in this manner is that the gaming machine doesn't have to accept and store a ticket voucher, which can potentially lower operation costs.

The casino account can include secondary contact information for the player, such as an email. When transaction verification is requested, the remote server can be configured to send a message using the secondary contact information indicating a transaction has been requested. In one embodiment, the message can include biometric information, such as an image of the person requesting the transaction. The image of the person can be capture using an image capture device located on the candle device. Alternatively, the remote server can send the secondary contact information to

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the secondary processor which can generate and send the message indicating a transaction has been requested via the secondary contact information. For instance, an e-mail message, text message or voice message can be sent to the user associated with the account. The text message or voice message can be sent to a phone number that is different from a number of a portable electronic device used to initiate the transaction.

In another embodiment, the account information received from the player's portable device can be for an external account, such as a debit card. The funds can be associated with the debit card, i.e., a particular amount associated with the card or the funds can be linked to an account, such as bank account. The verification information that is received via the verification interface, such as a PIN, can be sent to a casino server. The casino server can then contact a remote device such as a remote device associated with a financial institution for verification and approval of the transaction. In another embodiment, the secondary processor can be configured to directly contact the remote device for verification. An advantage of routing all of the verification and transaction approvals through a single casino server is that the access points to the internal casino network are limited because all of the transaction requests are routed through a single casino server.

For a transaction, such as the debit card transaction described above, when a user can be identified with the transaction, the candle device can be configured to determine whether the user associated with the transaction is registered in the loyalty program and whether the loyalty program account stores secondary contact information for the user. When the candle determines secondary contact information is available, it can generate a message indicating an attempted transaction has been made via the communication mode associated with the secondary contact information. As described above, the message can include biometric information, such as an image of the person attempting the transaction, as well as transaction information received, such when, where and what type of transaction was attempted.

In **512**, the candle device can receive touch sensor data from the main display and determine what information has been entered, such as a PIN or a transaction amount. In response to receiving the verification information, the candle device can also attempt to gather biometric information. For instance, an image capture device on the candle can be used to take a picture of the person initiating the transaction. In **514**, the verification information can be sent to a remote device where the remote device determines whether the transaction is to be authorized based upon the verification information. In another embodiment, the candle device can request verification information from the remote device based upon the account information received from a secondary device, such as a bill validator. Using the verification information received from the remote device and the verification information received from the interface, the candle can compare the information and determine whether the transaction is valid.

In **516**, the candle device can display to the verification interface a transaction status, such as transaction verification in progress. When the verification of transaction is complete, the candle device can display whether the transaction has been authorized or not. Next, the candle can close or display alternate content in the verification interface. When the verification interface is closed, the candle device can resize the window that is used to display the game content. For instance, the window can be enlarged to fill the entire display as opposed to a portion of the display. In one embodiment,

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a player can register secondary contact information in a loyalty program account with the casino.

According to an embodiment, a player does not need to carry a physical loyalty card in order to participate in the loyalty program while engaged in game play. Instead, the player can participate in the loyalty program via a mobile application on the player's mobile electronic device **240**, such as a smartphone, tablet computer, etc. According to an embodiment, a player can first "virtualize" his or her traditional plastic physical loyalty card to create a "mobile loyalty card," which can then be used to track the player's game play at electronic gaming machines **1** throughout the casino's network. It will be understood that the mobile electronic device **240** can communicate with the electronic gaming machine **1** wirelessly, and that the electronic gaming machine **1** can communicate wirelessly with a remote server **204**, as shown in FIG. **8**. In some embodiments, the wireless communication can take place via the candle **2**. The mobile loyalty card can be created using an application on a portable electronic device **240**.

The mobile loyalty card can then be used wirelessly via the application on the portable electronic device **240** to initiate tracked play at an electronic gaming machine **1** or an electronic gaming table (not shown) and the player can also use the mobile application on the portable device **240** to view statistics of the player's game play from electronic gaming machine **1** to electronic gaming machine **1** and even from casino to casino. In an embodiment, the system can include a remote server **204** that can be securely connected to electronic gaming machines **1** in the casino. The secure connection between the electronic gaming machines **1** and the remote server **204** can be either wireless (e.g., via the candle **2**) or wired. The electronic gaming machines **1** can include components, such as a game controller, card reader, printer, and SAS. Other services can also be made inside the casino that can interface with the electronic gaming machines **1** and/or the server **204**. In some embodiments, the mobile system can function across geographic regions and/or cross-regulated area such that a user can have a seamless experience using the same mobile loyalty card on his or her smartphone when traveling across geographic regions, such as from Las Vegas to California.

With reference to FIG. **8**, the remote server **204** can be securely connected to electronic gaming machines to transmit and receive information to and from the electronic gaming machines **1**. The remote server **204** can be connected to a processor **250** inside each electronic gaming machine **1** via a secure wired or a wireless network connection. The processor can be associated with a gaming device which is separate from the game controller, such as a candle device or the gaming device **700** described below with respect to FIG. **16**. External scalable secure mobile services **270** can interact with the mobile loyalty card application on a player's portable electronic device **240**. The system can also include internal mobile services **260** within a casino for securely connecting the remote server **204** with external mobile services **270**. The processor **250** can read and write to existing systems (e.g., printer, card reader, bill validator, etc.) in the electronic gaming machine **1** without interfering with their existing purposes. Furthermore, the processor **250** can also interface with other peripheral devices of the electronic gaming machine **1**, such as a video screen, SAS, speakers, buttons, and other devices.

The mobile application can be acquired by the user using a variety of methods. FIG. **9** shows some exemplary methods of acquiring the mobile application. For example, the user can download and install the application to his or her

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portable electronic device **240** after the user finds the application when searching for it in an AppStore or Marketplace in external mobile services **270**. The application can be compatible with a mobile operating system such as iOS or Android. Alternatively, the user can scan a QR code or other optically formatted image data displayed on an electronic gaming machine screen, such as a touch screen display **4** as shown in FIG. **9**, and the QR code directs the user to the application in an AppStore or Marketplace via an Internet link. The user can then click on the link to install the mobile application.

According to another method shown in FIG. **9**, the user can enter his or her mobile phone number on the electronic gaming machine **1**, which sends the phone number to the remote server **204**, and a text message is then sent to the user's portable device **240** with an Internet link (or some other type of network address) directing the user to the application in the App Store or Marketplace in external mobile services **270**. Once the user clicks on the link and finds the application, he or she can install it on the portable electronic device **240**. A casino host or other personnel can also assist the user in installing the application on the user's portable electronic device **240**.

Once a user acquires the mobile application on his or her portable electronic device **240**, the user can create and configure a mobile loyalty card account. FIG. **10** shows an embodiment of a method of setting up a mobile loyalty card account. For example, the user can set up his or her username and password and also enter his or her email address to be associated with the account. This information is transmitted from the user's portable electronic device **240** to external mobile services **270** and can be stored in a database **290**. The user can also view and agree to the terms of the use and privacy policies for the virtual card and the mobile application.

According to an embodiment, in addition to setting up the account, the user can also upload a picture to the mobile application via mobile services **270**, as shown in FIG. **10**. The picture can be, for example, a photograph of the user and can be used as a security feature when the user logs into his or her account. In an embodiment, the user can either touch a photo icon on the touchscreen of his or her portable electronic device **240** to take a photograph of himself or herself, or the user can download an existing photograph from a photo roll on the portable device **240**. Alternatively, the picture chosen can be something the user selects to be identified with his or her virtual card and to use as a security check. In an embodiment, the user can also associate other social media accounts (e.g. Facebook, Twitter, Google+ etc.) with the virtual card account via external mobile services. According to an embodiment, external mobile services **270** can send a PIN code to the user's portable electronic device **240** and the user can complete the registration by entering the PIN code in the application. Besides a PIN, which consists of numbers, other types of codes including letters and symbols can be used. It will be noted that the mobile users can be either inside or outside the casino when acquiring the mobile application and/or setting up his or her account.

Once the account set up is completed, a user can sign in to virtualize his or her existing player loyalty card by associating the existing player loyalty card with the newly set up account. FIG. **11** illustrates an exemplary method of virtualizing an existing player loyalty card. If the electronic gaming machine **1** detects a mobile device **240** that is recognized by data stored in the database **290**, the picture selected by the user can be transmitted to the portable

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electronic device **240** so that it can be displayed on the device **240**. The user can then use it as a check to see that the correct picture is displayed to ensure security. The user can log in to the account by entering his or her username and password. In addition or in lieu of a username and password a user can provide biometric information, such as finger print information. If an incorrect username or password or username/password combination is entered, a message can be sent to the mobile device **140** indicating an error, as shown in FIG. **11**.

At the electronic gaming machine **1**, the user can virtualize his or her existing player loyalty card by associating it with the account to which the user has created. According to an embodiment, when an electronic gaming machine **1** detects the presence of a portable electronic device, a picture-in-picture (PIP) display can appear in a display of the electronic gaming machine **1** to advertise the mobile loyalty card application, as shown in FIG. **12**. This PIP display can advertise the mobile application sign-up process.

According to another embodiment, the PIP display advertising the mobile application sign-up process can appear after a player inserts his or her player loyalty card into the card reader on the electronic gaming machine **1** if the system does not recognize the card. If the player inserts the card into the card reader and chooses to associate the card on the mobile application, the card reader can send the data stored on the magnetic stripe on the card to external mobile services **270** via the processor **250** (and internal mobile services **260**). The data can be stored together with the electronic gaming machine and property identification information in the mobile services database **290**.

The mobile application can also ask the player to use his or her portable electronic device **240** to scan the QR code on the electronic gaming machine display **4**, as shown in FIG. **13**. When the QR code is scanned, the QR code can contain the same electronic gaming machine and property identification information so the loyalty card magnetic stripe data already stored in the database **290** can be associated with a particular mobile device **240**.

Once a player's account has been set up, the virtual mobile loyalty card can be virtually inserted into an electronic gaming machine **1** by scanning the QR code on the electronic gaming machine **1** with the player's portable electronic device **240**. In one embodiment, as illustrated in FIG. **13**, the player can choose to "insert card" on either the mobile application or the electronic gaming machine display **4** to virtually insert the mobile loyalty card. The mobile application and/or the electronic gaming machine **1** can ask the mobile user to scan the QR code on the electronic gaming machine **1**. Alternatively, the player can scan the QR code on the electronic gaming machine **1** after selecting "insert card" on either the mobile application or the electronic gaming machine **1** to virtually insert the mobile loyalty card.

According to an embodiment, as illustrated in FIGS. **13** and **14**, the virtual insertion of the mobile loyalty card is not complete until the user enters a code, such as a PIN, that is sent to the user's portable electronic device **240** and the user can be asked to enter the same code on the electronic gaming machine **1**. In some embodiments, the code expires after a period of time (e.g., two minutes or five minutes). If the code has expired, the user may have to start the virtual insertion process again in order to complete the virtual insertion of the mobile loyalty card.

As shown in the embodiment in FIG. **14**, when the code is entered on the electronic gaming machine **1** by the user, the processor **250** can send the code to the remote server **204**

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to match the code with the currently active codes. If the code matches, the player data associated with the mobile loyalty card is sent back to the processor **250** of the electronic gaming machine **1**. The processor **250** can then send the card data to the card reader which can transmit the data to the patron management or player tracking system.

When the mobile loyalty card is virtually inserted into an electronic gaming machine **1**, hardware **280** (FIG. **8**), such as a spoofing device, can send or block signals to the Slot Machine Interface Board (SMIB), which is connected to the patron management or player tracking system. The spoofing device **280** can be activated by the processor **250** when a mobile loyalty card is virtually inserted into the electronic gaming machine **1**. As shown in FIG. **8**, the spoofing hardware **280** can be operably connected to both the card reader of the electronic gaming machine **1** and the patron management or player tracking system. The sending and/or blocking of signals by the spoofing hardware **280** to the patron management or player tracking system can mimic the signals that would be sent by the SMIB to the patron management or player tracking system when a traditional plastic physical loyalty card is inserted into the card reader. For example, the spoofing device **280** can block signals from the card reader to the patron management or player tracking system that indicate no player loyalty card is inserted into the card reader. Instead, the spoofing device **280** can send signals to the patron management or player tracking system indicating that a card is inserted into the system. Data associated with the mobile loyalty card that has been virtually inserted can also be sent to the patron management or player tracking system via the SMIB by either the processor **250** or the spoofing device **280**. It will be understood that, for simplicity, the spoofing hardware **280** and the SMIB are not shown in FIG. **14**.

When the mobile loyalty card is virtually inserted into the electronic gaming machine **1**, the player's play can be tracked and the electronic gaming machine **1** can display the associated player information (e.g., photograph, name, etc.) on the electronic gaming machine display **4** and/or mobile application. Game play can be tracked by the processor **250** and events from the electronic gaming machine **1** can be sent by the processor **250** to the mobile network together with the electronic gaming machine **1** and casino identification information.

As noted above, after the mobile loyalty card is virtually inserted, features, such as, for example, coupons, promotions, and other advertisements, can also be presented to the player via the mobile loyalty card. Such features can be presented on the mobile application and/or the electronic gaming machine **1**. Once a player's physical loyalty card is associated with his or her portable electronic device **240**, the player may be able to view a list of current promotions or coupons that can be redeemed at the electronic gaming machine **1**. The list of current promotions can be displayed on an electronic gaming machine **1** display or on the portable electronic device **240**. These promotions and coupons can be customized for a particular player. The player can also receive notifications about new promotions that can be pushed to the portable electronic device **240** even when the mobile application is not open on the portable device **240**. The player can also view the current status of his or her player points for each of the cards associated with the account. The player can also view daily/weekly/monthly summary of games played, machines played, etc.

Furthermore, a feature can be presented to just the player or to all registered users of the mobile application or just to certain groups of users. For example, the mobile application

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can notify users' smartphones that free play is available and when these users next associate their phones with electronic gaming machines 1, the free play can be either printed as a coupon or credit can be added directly to the electronic gaming machine 1. Other casino redeemable coupons, such as, for example, coupons for prizes, giveaways, or services (e.g., a free buffet or 20% off a spa treatment) at the casino can also be supported. The mobile loyalty card can be virtually removed when a player plays to zero credits or cashes out of the electronic gaming machine 1.

FIG. 15 is a perspective drawing showing exterior portions of an electronic gaming machine 450. A radio candle mount 18 is disposed between a candle 2 and a top portion 406 of an EGM cabinet. In this example, the top portion 406 is a top box. In various embodiments, EGMs can include or not include a top box. The radio candle mount 18 may have been installed when the EGM 450 was manufactured or as part a subsequent retrofit process. A controller associated with a secondary gaming device 700 or an EGM controller 424 can be coupled to and configured to use the one or more wireless interfaces associated with the radio candle mount 18. In one embodiment, the secondary gaming device 700 and EGM controller are mounted within an interior of the EGM 450.

The gaming machine 450 can be used to play a wager-based game. The wager-based game can be generated under control of a game controller disposed within a main cabinet 430. The door 404 can be opened to provide access to an interior of the EGM. As described above, one or more secondary gaming devices, such as described with respect to FIGS. 1 and 16 can be disposed within the interior of the EGM.

The gaming machine can include a player tracking panel 405 (e.g., a display 410, a card reader 412 and/or a key pad (not shown)) for performing player tracking transactions, a monitor or reel area 420 for displaying the wager-based game, a player input panel 446 (generally having buttons) for making selections associated with the play of the wager-based game, such as for inputting game related decisions and wager amounts, a coin-in acceptor 444 for accepting coins, a bill acceptor 426 for accepting bills, printed tickets and/or cashless media, a coin-out device (hopper) for outputting coins and/or tokens to tray 448, and a ticket printer 416 for generating cashless or promotional tickets. In addition, the ticket printer 416 can be used to generate other types of printed documents, such as receipts, boarding passes, tax forms, lottery tickets, keno tickets, etc.

Many different types of EGMs including tables used for table games can be equipped or retrofit with the radio candle mount 18 and secondary gaming devices as described herein and the EGMs are not limited to the example shown in FIG. 15. The EGMs can have different combinations of devices than those shown in FIG. 15. For instance, some EGMs may not include a coin acceptor or a coin hopper. Further, different types of gaming machines, such as class II bingo type EGMs or lottery terminals can also be equipped with the radio candle mounts and/or secondary gaming devices described herein.

The EGM 450 can have a game controller 424 disposed within a locked enclosure. The game controller 424 can be configured to control a wager-based game played on the gaming machine including receiving wagers on the outcome of a game. The game controller can include a random number generator that is used to determine outcomes. In addition, the game controller can be connected to a number of devices that are used during operation of the gaming machine. For instance, the game controller can be commu-

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nicatively coupled to the candle 2, the monitor 420, the printer 416, the bill/ticket acceptor 426, the player input panel 405, the coin-in (acceptor) 444, the coin-out (hopper) 432 and the audio system 418. The candle 2 can be one of the enhanced candles described above or can be a more basic candle with limited functionality.

The game controller can be configured to send commands to the peripheral devices that control their operation and receive data, such as acknowledgement of the commands from the peripheral devices in response. The game controller can execute regulated gaming software to perform these functions. The game controller can also access various network interfaces that allow the game controller to communicate with external devices. For example, the player tracking panel 405 can include a player tracking communication interface (SMIB 810 in FIG. 17) which can be used by the game controller to communicate with external devices. Also, the communication interfaces can be separate from a player tracking unit.

In one embodiment, the monitor 420 can be a touch screen display. The display can be configured to receive video content from each of the game controller and a secondary gaming device described above. For example, first content from the game controller can be displayed on portion 440 of the display 420 and second content from a controller in the secondary gaming device can be displayed on portion 442 of the display 420.

In one embodiment, the controller 60 associated with the display 420 can be configured to receive sizing, scaling and positioning commands that allow content received from multiple sources to be displayed in different portions of the display. In another embodiment, a secondary gaming device, such as 700 in FIG. 16 or 2 in FIG. 1, can include a controller for performing these functions.

The sizing, positioning and scaling commands can result in content sent to the display 420 to be output in a stretched or a compressed format relative to the native resolution in which content the content is generated. For example, video content output from a game controller in a native format can be stretched or compressed. As described above, one or more of the controllers on the EGM can be configured to generate translation functions for the video input and for the touch screen output that interpolates the video input to fit within a designated display area and interpolates the touch screen output to account for positioning and scaling commands received from an external device.

The touch screen display 420 can be the main display the gaming machine 450 where video content associated with a wager-based game generated by the game controller is displayed. The game controller can be configured to output the video content in a native resolution, such as 640 by 480. The native resolution can vary from EGM to EGM. The video content can include indications of locations where a touch detected by a touch screen can cause the game controller to perform an action in response. For instance, in response to a detected touch, the game controller can change the video content output to the touch screen display.

In one embodiment, the touch screen display 420 can be a replacement display such that it replaces the display installed in the EGM during its manufacture. For example, the replacement display can be installed during a retrofit of an EGM. When used as replacement display, the touch screen display 420 can have a resolution that is greater than the native resolution in which the video content output by the game controller is generated. For instance, the touch screen display 420 can have resolution of 1280 by 960 while the native resolution of the content output by the game

controller **16** is 640 by 480. When a display technology with a fixed pixel size, such as an LCD, is used as the replacement display, interpolation and/or smoothing can be utilized to scale the content output from the gaming controller to fit the resolution size of the display. These functions can be performed by a controller on the EGM, such as a controller associated with a secondary gaming device, which is installed as part of a retrofit. In another embodiment, one or more of these functions can be performed by a controller associated with the display **420**.

As described above, a first controller can be configured to receive sizing, positioning and scaling related commands, which affect video content output to the display **420**, such as video content from a plurality of different sources. In one embodiment, a secondary controller is configured to generate these sizing, positioning and scaling related commands and not the game controller. For instance, the secondary controller can be configured to select picture in a picture modes that allows the video content output from game controller to be displayed on different portions of the touch screen display at different resolutions where the native resolution output by the game controller and sent to the touch screen display is constant and is altered after it generated via one or more secondary controllers.

The sizing, scaling and positioning commands can be associated with picture-in-picture (PIP) capability of the display **420**. Using the PIP capability, video content can be transmitted from a secondary gaming device and displayed as a PIP mode on the display **420**. In one embodiment, the video can be transmitted via a USB interface (see **706**, in FIG. **16**). Via a secondary gaming device, the PIP capability can be used to output real-time or stored video for the player. The real-time video can be received from a remote source, such as a server located on an internal network (see **107**, in FIG. **5**) or external network (e.g., the Internet).

In one embodiment, one or more secondary gaming device can control the PIP independently from the game controller. Thus, the game controller may not be aware that the video content that it is outputting is affected by PIP commands issued by the one or more secondary gaming devices or that the one or more secondary gaming devices is sending control commands to the display **420**. Thus, the PIP capabilities can be provided in a retrofit situation without modifying the game software executed by the game controller prior to the retrofit.

In another embodiment, the game controller can be configured to transfer or allow control of the display **420** by a secondary gaming device. Thus, the game controller may be aware of the secondary gaming device and configured to communicate with it in some manner. As an example, the game controller can be configured to hand over control to a secondary gaming device to allow it to display a bonus game presentation or a wager-based game presentation on all or a portion of the touch screen display **420**. Thus, game controller can engage in bi-directional communications with the secondary gaming device to indicate when the display is available and the secondary gaming device can communicate when it is finished using the display. When the secondary gaming device indicates it has completed displaying the bonus game presentation or outputting some other type of video content, the game controller can reassume control of the display **420**. When the game controller controls the display, it may prevent a controller on a secondary gaming device from outputting content to the display **420**.

FIG. **16** is a perspective drawing of a secondary gaming device **700** including numerous power and communication interfaces in accordance with the described embodiments. In

particular embodiments, the secondary gaming device **700** can be configured to perform of any combination of the functions described above with respect to the candle controller (e.g., **31**). Further, the secondary gaming device can be configured to perform the video scaling, touch screen scaling and other functions of the controller **60** described above with respect to FIGS. **3A** and **3B**.

The secondary gaming device includes a housing **702**. In one embodiment, the housing **702** is box shaped with six planar sides. The housing **702** can be other shapes and the example of a box is provided for the purposes of illustration only. In one embodiment, the length, width and height dimensions of the housing **702** can be about 8 inches (L) by 3.5 inches (W) by 2.5 inches (H) for a volume of 70 cubic inches.

An internal volume of 100 cubic inches or less provides adequate area for the power and data connectors and volume for the internal circuitry coupled to the connectors including a processor and memory. The volume allows for the housing **700** to fit in the excess space in the interior cabinet of a variety of different types of EGMs. In a retrofit installation, the excess space can be a location within the EGM cabinet not occupied by the existing EGM components at the time of installation of device **700**. The location and the orientation in which the secondary gaming device **700** is installed in the EGM can vary from EGM to EGM depending on the internal configuration of the EGM.

In one embodiment, all of the power and data connectors can be located on one planar surface of the housing. For example, the housing **702** is box-shaped and all of the connectors are located on surface **702a**. Thus, no connectors are located on the side opposite **702a**, side **702b** and its opposite side and side **702c** and its opposite side. This feature can simplify the installation process as all the power connectors are accessible and visible at the same time which can be important when installing the device **700** in a cramped interior of an EGM cabinet. In another embodiment, the power and data connectors can be distributed across only two surfaces, such as surface **702a** and **702c** for example or between surface **702a** and its opposite side.

One advantage of locating the power and data connectors on only one or only two surfaces of the housing is that it allows the housing to be mounted in a variety of orientations. For example, for housing **702**, one or more of the remaining sides can be used for mounting purposes. For example, an attachment interface can be placed on any of sides **702b** and its opposite, **702c** and its opposite and **702a** and its opposite. The orientation of the device **700** in an installed position can depend on the orientation of one or more surfaces in an interior of an EGM to which one or more sides of device **700** are coupled. For example, the device **700** can be mounted to a horizontal surface, a vertical surface, a combination of both a horizontal and a vertical surfaces or a slanted surface).

In one embodiment, a Velcro-type interface, such as Velcro-type tape with two adhesive sides, can be used to couple one or more sides of housing **702** to one or more surfaces within an EGM cabinet, such an interior surface of the cabinet or a surface associated with some other device within the EGM cabinet. In another embodiment, another type of fastener, such a mounting bracket can be used. With a Velcro-type interface, gaming device **700** can be easily swapped with another device if the device is faulty or needs to be upgraded.

The housing **702** can enclose the connectors, processors and memories. The components, such as the processors can generate heat. The housing **702** can include a number of

vents, such as a grill of small holes **704**, for cooling purposes. A cooling device, such as a fan may be located within the housing or coupled to an exterior portion of the housing. In another embodiment, the housing can be sealed and cooling mechanisms can be placed on the outside and/or inside of the housing, such as heat sinks with radiators or water cooled systems. Sealing the housing can protect the electronic components from dust and/or other contaminants which can cause shorts and limit access to the interior housing, which may be beneficial for security purposes. When vents, such as **704** are used, the vents can be covered with a grill or a mesh to prevent dust intrusion.

In one embodiment, the housing **702** can be formed from two or more pieces. The pieces can be configured lock or snap together or be secured to one another via some other type of fastener. Security sensors can be placed within the housing **702**. The security sensors can be configured to detect an access to an interior housing and/or manipulation of any of the internal components, such as a processor and/or memory disposed within the housing **702**. A processor associated with the secondary device can monitor the security sensors. In addition, the processor can be configured to monitor security sensors or receive security related data associated with the EGM as is described above with respect to FIG. **15**.

The housing **702** can include a number of apertures for power and data connectors. When device **700** is installed in an EGM, such as during a retrofit, new power and data pathways may be established between the device **700** and various other devices within the EGM cabinet using the power and data connectors. In some instances, the power and data pathways may be temporary in that they are only used during the installation process. In other instances, the power and data pathways may be more permanent in that the power and data pathways are utilized when the EGM is available for wager-based game play. The new power and data pathways may be wired or wireless pathways. All or a portion of the power and data connectors in any combination, which vary from EGM to EGM, may be used to establish the new power and data pathways. In one embodiment, the new power and data pathways can be utilized without modifying software executed by the game controller prior to installation of the secondary device **700**.

In one embodiment, face **702a** includes a number of serial data ports. For example, four USB ports **706** and five ports, **718**, **720**, **722**, **724** and **726** which allow serial data communications using other serial communication protocols are provided. Other types of serial ports using different communications protocols can be provided and the secondary device **700** is not limited to a USB protocol. Devices, which can be coupled to these ports in different embodiments, are described in more detail as follows and have been previously described above with respect to the candle device embodiment.

Ports **710** can be used to couple a keyboard and mouse to the secondary gaming device **700**. In one embodiment, the keyboard and mouse can be used only during the installation process to install software and configure the secondary gaming device **700**. In addition, the video port **708** can be used during the installation process. For example, port **708** can output video associated with a configuration interface generated by device **700**.

A number of power related connectors are provided. For example, ports **715** and **716** can be used to receive power, such as a 12 DCV power. A power source, such as an AC power source can be converted to the DC voltage. Other voltages are possible and 12 Volts is provided for illustrative

purposes only. The connection format is different for each port. For example, port **715** accepts a round connector while port **716** accepts a rectangular connector. Ports **736** and **738** can be used to supply power to other devices coupled to the ports. In addition, the USB ports **706** can be used to provide power to devices coupled to the secondary gaming device.

The secondary gaming device can include a number of video and audio ports. For example, port **708** is a video port which can be used to output video from the device **700**. In one embodiment, port **708** may only be used when device **700** is installed, serviced or verified form regulatory purposes. In one embodiment, the port **708** is a VGA compatible. In other embodiments, different video interfaces can be used, such as DVI or a mini-Display-Port. Port **712** can be used to output video and audio signals. In one embodiment, it is HDMI compatible port. An example of a configuration using port **712** is described below. Port **728** can be used to output audio signals. Port **730** can be used to receive audio signals, such as from a microphone. The USB ports **706** can be used to receive and send audio and video signals.

The secondary device can include a number of network connectors for communicating with remote devices, such as remote servers or portable electronic devices. For example, port **714** can be used to establish a network connection, such as an Ethernet connection. Further, one of the USB ports can be used to couple gaming device **700** to a wireless interface. For example, a radio candle mount, as described above, can be coupled to the secondary gaming device via one of the USB ports **706**. The secondary gaming device **700** can be configured to utilize one or both of wireless and wired communication interfaces for network communications.

One or more status related devices can be provided on secondary gaming device **700**. For example, a light **732** can be provided which indicates the secondary gaming device is receiving power. In another embodiment, a light (not shown) can be provided which indicates the secondary gaming device is in a ready or operational state. A switch **734** can be provided for resetting or cycling power on the secondary gaming device. A pin can be inserted through an aperture to activate switch **734** and cycle power on the secondary gaming device.

FIG. **17** is a connection diagram **800** of a secondary gaming device **700** coupled to an EGM. This configuration is provided for purposes of illustration only as different combinations of devices can be coupled to the secondary gaming device. For example, in some embodiments, the secondary gaming device **700** may not be connected to a card reader. In other embodiments, the secondary gaming device can be coupled to a camera (not shown). In yet other embodiments, the secondary gaming device can be connected to a candle device. In other embodiments, it may not be connected to candle device.

A first one of the USB ports **706** is connected to a value input device, which is a bill validator **426** in this example. The bill validator **426** can also be configured to communicate with the EGM controller **424**. As described above, the EGM controller **424** can control a play of a wager-based game on the EGM including determining an outcome to the game, which may be a random outcome, and determining an award associated with the determined outcome. In various embodiments, the secondary gaming device **700** and the EGM controller can be configured to both communicate with and/or both control one or more of the devices on the EGM. For example, both the secondary gaming device **700** and the EGM controller can communicate and control a display, a printer or a bill acceptor. In other embodiments, the secondary gaming device or the EGM controller **424**

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may only communicate with and/or control a particular device. For example, the secondary gaming device can communicate with a wireless interface which is not communicatively coupled to EGM controller or the EGM controller can communicate with a bonus device, such as wheel, which is not communicatively coupled to the secondary gaming device.

In a retrofit, a communication connection can be interposed between a new communication pathway between the EGM controller and another device, such as the bill validator, or the new communication pathway can be added as a separate connection. For example, the EGM controller can communicate with a device, such as the bill validator, via one communication pathway coupled to a first port on the bill validator and the secondary gaming device can communicate with a device, such as the bill validator, via a second communication pathway coupled to a second port separate from the first port. As another example, both the EGM controller and the secondary gaming device can communicate with a device, such as the bill validator, via a common port, where a connection was added during the retrofit which allowed the secondary gaming device to share the common port.

In a particular embodiment, the secondary gaming device may be able to interrupt a communication from the bill validator **426** to the EGM controller **424** or from the EGM controller **424** to the bill validator **426** and optionally generate a substitute communication. For example, the bill validator **426** can receive currency or a printed ticket and attempt to send the information to the EGM controller **424**. The secondary gaming device **700** can be configured to interrupt the communication to the EGM controller **424** so that it doesn't reach the EGM **424** controller and instead process the communication and send a response to the bill validator. In another embodiment, the secondary gaming device **700** can be configured to route the interrupted communications to one or more remote devices via a network interface associated with the secondary gaming device. In some instances, when a signal is routed to a remote device, the remote device can be configured to generate a substitute signal.

In general, the secondary gaming device **700** can be configured to interrupt communications between two logic devices and optionally generate substitute communications on any communication pathway on which it is interposed between the two logic devices. For example, the secondary gaming device **700** can be interposed on a communication pathway between a card reader and a player tracking controller. After it is interposed, the secondary gaming device can be configured to interrupt a communication from the card reader to the player tracking controller or from the player tracking controller to the card reader. The secondary gaming device can then generate a substitute communication. In one embodiment, the substitute signal can be generated based upon information contained in the interrupted communication. In another example, the secondary gaming device can be interposed between the player tracking controller and the EGM controller.

Also, the secondary gaming device **700** can be configured to route communications between two logic devices to alternate devices. The communication routing can involve changing the destination of communication from its original recipient. For example, a communication sent from a bill validator **426** to the EGM controller **424** can instead be sent to another destination, such that the EGM controller **424** doesn't receive the communication.

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In another embodiment, the communication routing can involve cloning all or a portion of a communication and sending it to one or more additional sources. For example, a communication sent from a bill validator **426** to an EGM controller **424** can be cloned such that the EGM controller **424** receives the communication and one or more additional devices receive all or a portion of the communication. The routing and cloning functions can be invisible to the devices which have sent a communication. For example, when the bill validator **426** sends a communication to the EGM controller **424** or vice versa, the bill validator **426** and/or the EGM controller **424** may not know that the secondary gaming device **700** has rerouted or cloned the communication.

In one embodiment, the secondary gaming device **700** may only monitor communications to and/or from the bill validator **426**. For example, the secondary gaming device **700** can receive information related to monetary transactions performed on the bill validator **426**, such a transaction amount and even an image of a bill or scrip which has been accepted, and data related to the performance of the bill validator, such sensor data and or data from bill validator controller, which can indicate a status of the bill validator. The sensor data and/or data from the bill validator controller may be used to schedule maintenance for the bill validator **426**. For example, if the bill validator is rejecting currency or scrip which is above a threshold value, the secondary gaming device can determine maintenance is needed. This decision may also be determined by a remote device, which has received the bill validator information via the secondary gaming device.

In another embodiment, the secondary gaming device **700** can be configured to send data to the bill validator via the connection between the bill validator and the secondary gaming device. For example, the secondary gaming device **700** can be configured to download new firmware to the bill validator. In another example, the secondary gaming device **700** can be configured to send commands to the bill validator, such as command to reboot itself or a command to adjust operation of a sensor on the bill validator. In general, the secondary gaming device **700** can be configured to directly communicate with a controller on any of the devices to which it is connected. The communications can involve sending commands and/or data including software, which affects operation of the device.

A second one of the USB ports **706** is coupled to the radio candle mount **18**. Via this communication interface, the secondary gaming device **700** can be configured to send and/or receive wireless communications. Further details of a candle mount **18** are described in co-pending U.S. patent application Ser. No. 14/027,111, by Wells et al., filed Sep. 13, 2013 and titled "Radio Candle Mount," which is incorporated by reference in its entirety and for all purposes.

In one embodiment, the secondary gaming device **700** can be also coupled to a candle device **2**, via one of the USB ports. A third one of the USB ports is coupled to a display **802**. In various embodiments, the display **802** can be a main display on the EGM on which all or portion of a wager-based game is output, a secondary display on which the EGM controller **424** displays secondary information, such as bonus information, a player tracking display on which a player tracking controller displays information or a separate display, which is controlled by the secondary gaming device, alone or in combination with a remote device. In other embodiments, other devices can be coupled to one of the USB ports **706**. For example, a camera or other security device can be coupled to one of the USB devices.

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In particular embodiments, one or more of the USB ports can be configured to only connect to a particular type of device. For example, the secondary gaming device **700** can be configured to only recognize the bill validator **426** when it is connected to the first USB port of the four USB ports. If a bill validator **426** is coupled to one of the other three USB ports, the secondary gaming device can be configured not to recognize the bill validator. Further, if another type of device is coupled to the first USB port, the secondary gaming device **700** can be configured not to communicate with the device. In other embodiments, a greater number of USB ports, a lesser number of USB ports or no USB ports can be included on the secondary gaming device.

Typically, part of the USB protocol includes allows different types of devices to use a standard port. For example, a USB compatible keyboard can be plugged into the same port as a USB compatible mouse. Thus, a restriction of a particular USB port to a particular USB compatible device is not usually associated with USB.

Five serial ports, **718**, **720**, **722**, **724** and **726**, of different sizes and orientations are disposed beneath the USB ports **706**. In one embodiment, each of the non-USB serial ports can be configured to accept a particular type of device. The different ports sizes and orientations can be used to reduce installation mistakes, such as during a retrofit. If all the ports where the same size and the same orientation, then two different devices might be misconnected. For example, a printer **416** could be connected in the card reader port **722** and a card reader **412** could be connected in the printer port **726**. The different sizes and/or different orientations (a vertical versus horizontal orientation) helps to ensure the devices are correctly connected. Even though the ports sizes are different, the same communication protocol can be used on all or portion of the non-USB ports. For example, two or more of ports, **718**, **720**, **722**, **724** and **726**, can utilize an RS-232 communication protocol.

In the example of FIG. 17, port **718** is a spare port. However, it can also be used to support regulatory functions, such as verifying software installed on the EGM. Thus, in one embodiment, a gaming authorization terminal **804** or other type of device configured to perform regulatory functions can be coupled to the secondary gaming device **700** via port **718**. In another embodiment, another device, such as a connection to a button panel or button on the EGM can be established via port **718**.

Port **720** is configured to receive slot accounting communications from an EGM controller **424**. In the example, an interface **808** is interposed between the EGM SAS out **812** and a slot machine interface board (SMIB) **810**. In one embodiment, the interface **808** can have two components—a microcontroller board, and the harnessing. The microcontroller board, which may include proprietary firmware, can be a passive or active device that monitors communication between the EGM and the SAS host controller for the purpose of relaying information to the secondary gaming device.

The SMIB **810**, often coupled to a player tracking unit, is used to communicate EGM accounting information to a remote device. In this example, via the interface **808**, the secondary gaming device **700** can be configured to receive accounting related information from the EGM controller **424** sent via SAS interface **812** and forward it to a remote device if desired. Further, the secondary gaming device may be able to send certain SAS enabled commands to the EGM controller **424**, such as a command to add promotional credits to an EGM or print a promotional ticket. As described above,

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the secondary gaming device **700** can be configured to interrupt and generate substitute communications on this communication pathway.

SAS is one example of a communication protocol which an EGM controller, such as **424**, can use to communicate with a remote device. The Slot Accounting System (SAS) protocol was initially designed to automate slot machine meter reporting and event logging, SAS has evolved over the years to include player tracking, bonusing, ticketing and cashless gaming. SAS can be considered a casino communications standard because of its availability to all manufacturers in the industry.

The Gaming Standards Association (GSA), representing a broad range of gaming industry manufacturers and operators, adopted SAS 6 as a recognized communications standard for the industry in July of 2002. The latest version of the protocol is SAS 6.02, which is fully backward compatible with all previous versions. SAS 6.02 complies with the latest Nevada Gaming Control Board Technical Standards for gaming machine accounting, as well as providing complete multi-game and multi-denomination accounting. In various embodiments, the secondary gaming device can be configured to support different versions of SAS and other gaming specific communication protocols, such as protocols related to slot accounting.

Port **722** is coupled to a card reader **412**. The card reader **412** can be an existing card reader or one that is added during the retrofit. A microcontroller tap can be used for an existing card reader, such one on a player tracking unit coupled to an EGM. The microcontroller tap can plug in between the existing card reader and a SAS host controller. A new player card reader, which may be installed during a retrofit, can include a built-in port that directly connects to the secondary gaming device **700**.

Typically, a card reader, such as **412**, on an EGM communicates with and is controlled by a player tracking controller on the EGM. Via an interface, such as the microcontroller tap to the card reader **412**, the secondary gaming device may be able to receive information from inserted cards and perform functions not supported by a player tracking controller.

As an example, most player tracking controllers only recognize magnetic striped cards associated with a player tracking club. Via the interface to the card reader **412**, the secondary gaming device **700** may be able to recognize other types of cards, such as a credit and debit card inserted into the card reader. The information read from a credit or debit card might be used to perform a value transaction or merely identify a person which may not have a player tracking card. As described above, the secondary gaming device **700** can be configured to interrupt and generate substitute communications on this communication pathway. For example, when a credit card is inserted in the card reader, communications from the card reader **412** to a player tracking controller may be interrupted or cloned.

Port **724** can be coupled to a power reset device **414**. A power reset device **414** can be used to cycle power for one or more devices on the EGM including the EGM controller **424**. Additional details of a power reset device are described in U.S. patent application Ser. No. 13/890,285, titled, "REMOTE POWER RESET FEATURE ON A GAMING MACHINE," filed May 9, 2013, by Wells, et al., which is incorporated by reference and for all purposes.

Port **726** is coupled to a printer **416**. The secondary gaming device can be configured for real-time remote monitoring of the health of the ticket printer (paper low, paper out, ticket jams, etc.), allowing for quick resolution by floor

personnel. In particular embodiments, the secondary gaming device can monitor both Future Logic GEN2 Universal printers (Glendale, Calif.) connected via the second port on the printer and TransAct Epic950 Printers (Hamden, Conn.) connected via TransAct's eServer Port. Other types of printers can be monitored and these are provided for the purposes of illustration only.

Port **728** is coupled to an EGM audio amplifier **816** via interface **814**. In this embodiment, the interface is interposed between the EGM controller **424** and the audio amplifier **816**. Via the interface, the secondary gaming device **700** can be configured to output audio signals via speakers existing on the EGM. The speakers may also receive audio signals from the EGM controller **424**. The audio signals from the secondary gaming device can be mixed with or output separately from the audio signals generated from the EGM controller **424**.

A power supply **806** is shown coupled to port **716**. In one embodiment, an AC voltage associated with the EGM's power supply can be converted to a DC voltage. The DC voltage can be input via power port **716**.

A terminal **818** is shown coupled to ports **708** and **710**. In one embodiment, the terminal can support video, a keyboard and a mouse or touchpad. Typically, the terminal may be coupled to ports **708** and **710** during installation, repair or maintenance. In one embodiment, these ports may only be used for these purposes. In other embodiments, the ports can be used to support other devices outside of installation, repair or maintenance. For example, port **708** can be used to output video signals to a display device **802** coupled to the EGM while the EGM is operational for game play.

FIG. **18** is a diagram of gaming system configured to provide picture in a picture (PIP) gaming services on EGMs. In FIG. **18**, the secondary gaming device **700** is shown connected to a network switch **856** via a wired communication connection **866** from port **714**. In addition, via one of the USB ports **706**, the radio candle mount **18** can be used to establish wireless communications **110** between the secondary gaming device **700** and a remote server, such as **802**. The wireless communications **110** are received via wireless access point **860**. In a casino environment, numerous wireless access points can be provided.

The wireless access point **860** is coupled to a wireless switch **858**, which is coupled to the network switch **856**. Communications from the network switch **856** pass through a firewall **854** to server **852**. In one embodiment, server **852** can be used to monitor information from different gaming devices, which reside on numerous different EGMs. Further, the server **852** can be configured to send commands to and provide various services to a plurality of different secondary gaming device. In one embodiment, access to various internal external servers **862** can be provided via server **852**.

In a retrofit situation where an EGM is retrofit with a secondary gaming device, the EGM controller can execute software which specifies communications with a first set of servers. EGM software can specify what information is transmitted to each server, what communication channel is to be utilized, what communication protocol is to be utilized and what information can be received. The secondary gaming devices, such as **700**, can act as an intermediary device which is configured to receive the communications in the manner proscribed by the EGM hardware and software and respond to the communications as expected by the EGM controller. Thus, the secondary gaming device **700** emulates the external communication and functions expected by the EGM controller on the EGM, i.e., the EGM external device

configuration is emulated. The external communications that are emulated can vary from EGM to EGM.

The secondary gaming device **700** can receive communications from an external gaming device and the EGM and modify it in different ways. For example, an upgraded player tracking system may use a communication protocol between an external device and the secondary gaming device which is different than an older communication protocol that the EGM controller utilizes. The secondary gaming device can be configured to convert communications from the EGM controller to be compatible with the new communication protocol and convert communications from an external device to the EGM in the new communication to the communication protocol which the EGM accepts.

The external device configuration of the EGM controller emulated on the secondary gaming device **700** allows the actual external device configuration to be different than the configuration for which the EGM hardware and software is configured. For example, the EGM can include two hardware communication connections and software for communicating in two different protocols with two separate servers. The portion of the secondary gaming device facing the EGM can be configured to communicate with the EGM via the hardware interfaces and software protocols native to the EGM and the EGM controller. However, on the portion of the secondary gaming device facing the external devices. The actual external device configuration may be different than the native EGM configuration. For example, rather than communicating with two separate servers, the secondary gaming device may communicate with a single server using communication protocols different than what the EGM is configured to use.

As described above, the secondary gaming device **700** can be used to support picture in picture (PIP) functions on an EGM. In one embodiment, the secondary gaming device **700** can be coupled to another secondary gaming device **890**, which supports some of the PIP functions. For example, device **890** can be used to support receiving and modifying EGM controller generated audio, video and touch screen data under control of the secondary gaming device, alone or in combination with a remote server. For example, device **890** can be used to shrink a size of the EGM video data and output it with video data received from the secondary gaming device, such as in the PIP mode described in FIG. **3B**.

Further, device **890** can be used to route touches detected from a touch screen on the EGM to the secondary gaming device **700**. The touches may correspond to touch screen buttons output in the video data received from the secondary gaming device. In addition, the device **890** can be configured to interpolate touch screen data associated with the EGM video data when the data has been shrunk to a native resolution expected by the EGM controller.

The EGM controller can be configured to respond to or ignore touches from different locations on a touch screen. When the EGM controller video data is scaled, such as shrunk in size, the touch locations which are active change positions on the display. Thus, the interpolation can involve translating touch locations associated with video data with a first resolution to touch locations associated with video data with a second resolution, such as the native resolution of the video data generated by the EGM controller.

In FIG. **18**, device **890** is configured to receive power from device **700** via connection **872** to power port **886**. The device **700** can be configured to send video data to device **890** via one of the USB ports **706**. In this example, connection **870** is used to transfer video data from a USB port to a

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mini-USB port **884**. In an alternate embodiment, port **878**, which is an HDMI compatible port, can be used to receive video and/or audio data from device **700**.

Ports **876** and **882** can be used to send touch screen data to an EGM controller. Port **876** supports an RS-232C serial format. Ports **882** supports a communication format associated with some IGT machines. Additional ports (not shown) are used to receive touch screen data from a touch screen display in the formats associated with ports **876** and **882**. Other touch screen formats are possible. Thus, these examples are provided for the purposes of illustration only.

Port **874** can be used to receive video data generated under control of an EGM controller and sent to a touch screen display. An additional port (not shown) is used to output video data from device **890** to the touch screen display. The video data from device **890** can include only the video content received from the EGM, only the video content received from the device **700** or a combination of the video content received from the EGM and the device **700**. For example, the video data from device **700** and the EGM can be combined in a PIP format as described above. In one embodiment, in a retrofit, the video and touch screen data modifications as well as any functions performed by device **700** can be performed without modifying the gaming software existing on and executed by the EGM controller prior to the retrofit.

The various aspects, embodiments, implementations or features of the described embodiments can be used separately or in any combination. Various aspects of the described embodiments can be implemented by software, hardware or a combination of hardware and software. The described embodiments can also be embodied as computer readable code on a computer readable medium for controlling manufacturing operations or as computer readable code on a computer readable medium for controlling a manufacturing line. The computer readable medium is any data storage device that can store data which can thereafter be read by a computer system. Examples of the computer readable medium include read-only memory, random-access memory, CD-ROMs, DVDs, flash memory, memory sticks, magnetic tape, and optical data storage devices. The computer readable medium can also be distributed over network-coupled computer systems so that the computer readable code is stored and executed in a distributed fashion.

The many features and advantages of the present invention are apparent from the written description and, thus, it is intended by the appended claims to cover all such features and advantages of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, the invention should not be limited to the exact construction and operation as illustrated and described. Hence, all suitable modifications and equivalents may be resorted to as falling within the scope of the invention.

The invention is claimed as follows:

1. A device comprising:

a processor; and

a memory device which stores a plurality of instructions, which when executed by the processor, cause the processor to:

responsive to a wireless receipt, from a mobile device, of data associated with a mobile player tracking card associated with a player tracking account being virtually inserted:

block data communicated from a card reader of a gaming machine to a component of a player

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tracking system, the blocked data being associated with an indication that no physical player tracking card is inserted into the card reader of the gaming machine, and

send data to the component of the player tracking system which results in the component of the player tracking system interfacing with a processor of the gaming machine to cause an association of a gaming session with the player tracking account, and

responsive to an activity reporting event occurring prior to the mobile player tracking card being virtually removed, interface with the component of the player tracking system to report data associated with the gaming session.

2. The device of claim 1, wherein when executed by the processor, the plurality of instructions cause the processor to wirelessly interface with the component of the player tracking system.

3. The device of claim 1, wherein the data associated with the player tracking account is associated with a mobile application executed on the mobile device.

4. The device of claim 1, wherein the component of the player tracking system is selected from the group consisting of: a player tracking server, and a gaming machine interface board in communication with the player tracking server.

5. A method of operating a device, said method comprising:

responsive to wirelessly receiving, from a mobile device, data associated with a mobile player tracking card associated with a player tracking account being virtually inserted:

blocking data communicated from a card reader of a gaming machine to a component of a player tracking system, the blocked data being associated with an indication that no physical player tracking card is inserted into the card reader of the gaming machine, and

sending data to the component of the player tracking system which results in the component of the player tracking system interfacing with a processor of the gaming machine to cause an association of a gaming session with the player tracking account, and

responsive to an activity reporting event occurring prior to the mobile player tracking card being virtually removed, causing a processor to interface with the component of the player tracking system to report data associated with the gaming session.

6. The method of claim 5, further comprising causing the processor to wirelessly interface with the component of the player tracking system.

7. The method of claim 5, wherein the data associated with the player tracking account is associated with a mobile application executed on the mobile device.

8. The method of claim 5, wherein the component of the player tracking system is selected from the group consisting of: a player tracking server, and a gaming machine interface board in communication with the player tracking server.

9. The method of claim 5, which is provided via a data network.

10. The method of claim 9, wherein the data network comprises an internet.

* * * * *

EXHIBIT 5

EXHIBIT 5



(12) **United States Patent**
Nelson et al.

(10) **Patent No.:** **US 10,706,677 B2**
 (45) **Date of Patent:** ***Jul. 7, 2020**

(54) **METHODS AND APPARATUS FOR PROVIDING SECURE LOGON TO A GAMING MACHINE USING A MOBILE DEVICE**

(58) **Field of Classification Search**
 None
 See application file for complete search history.

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.
 This patent is subject to a terminal disclaimer.

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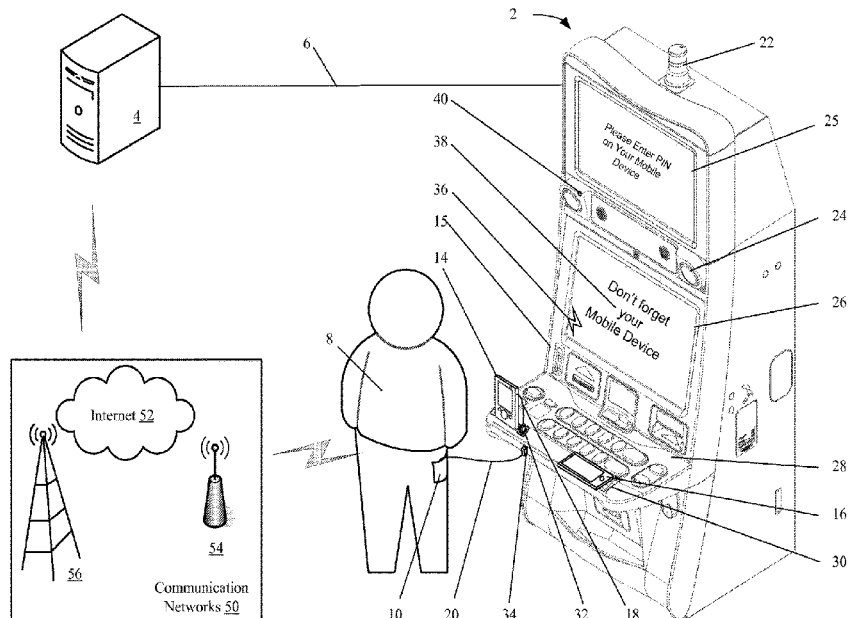
Primary Examiner — Seng H Lim
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(57) **ABSTRACT**
 A gaming system compatible with patron-controlled portable electronic devices, such as smart phones or tablet computers, is described. When a transaction is initiated on an EGM that requires the input of Sensitive Information data, such data can be input directly from the Player/Patrons Portable Electronic Device. Hence, such input of their Sensitive Information data is more discrete, and generally out of plain view from the other Player/Patrons.

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G07F 17/32 (2006.01)
A63F 9/24 (2006.01)
 (52) **U.S. Cl.**
 CPC **G07F 17/3241** (2013.01); **A63F 9/24** (2013.01); **G07F 17/32** (2013.01);
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19 Claims, 6 Drawing Sheets



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continuation of application No. 14/875,469, filed on Oct. 5, 2015, now Pat. No. 9,852,578, which is a continuation of application No. 14/181,372, filed on Feb. 14, 2014, now Pat. No. 9,875,607, which is a continuation-in-part of application No. 13/181,725, filed on Jul. 13, 2011, now abandoned, and a continuation-in-part of application No. 13/478,551, filed on May 23, 2012, now abandoned.

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CPC *G07F 17/3209* (2013.01); *G07F 17/3211* (2013.01); *G07F 17/3223* (2013.01); *G07F 17/3225* (2013.01); *G07F 17/3239* (2013.01); *G07F 17/3251* (2013.01); *A63F 2009/2457* (2013.01)

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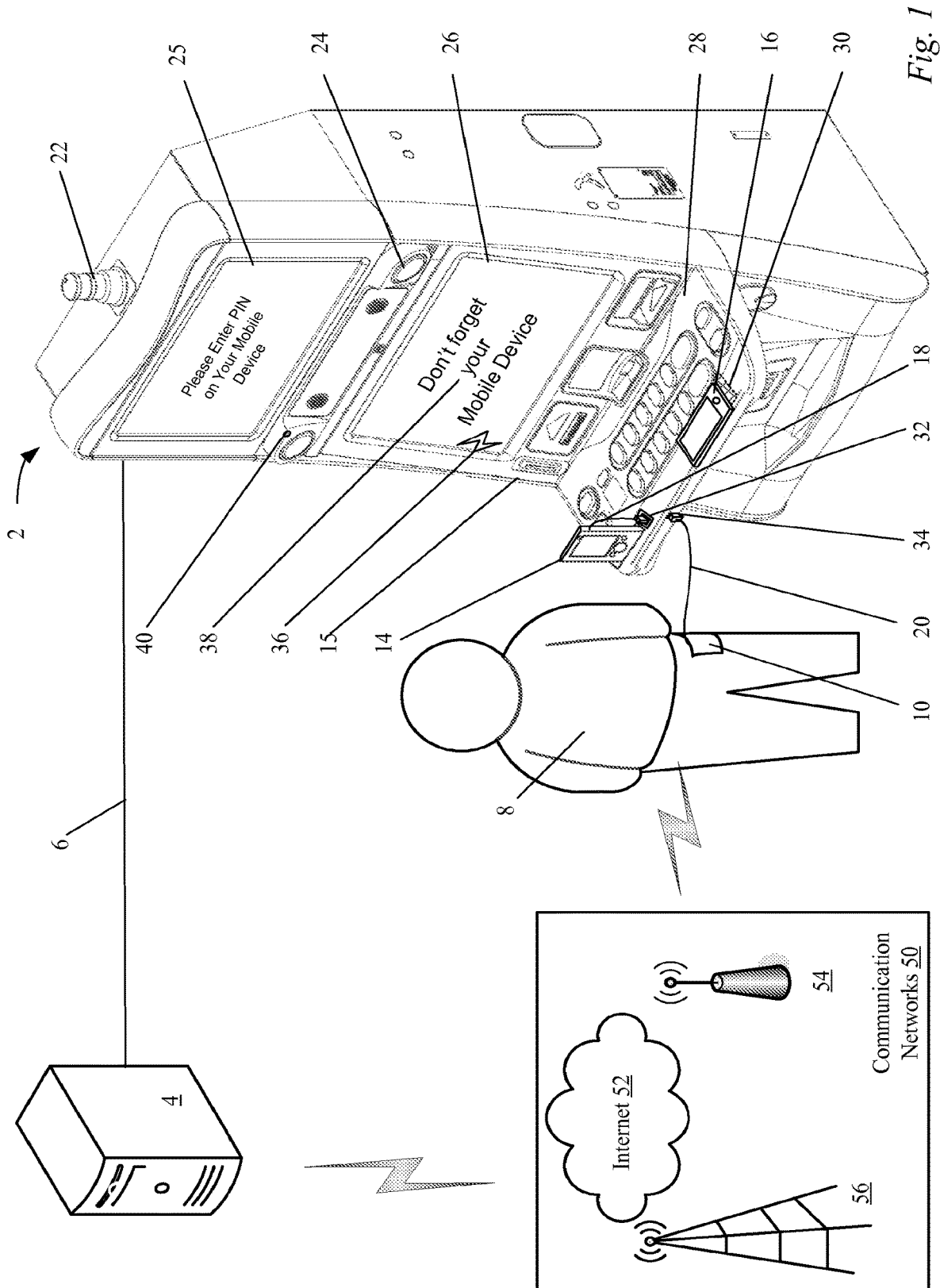
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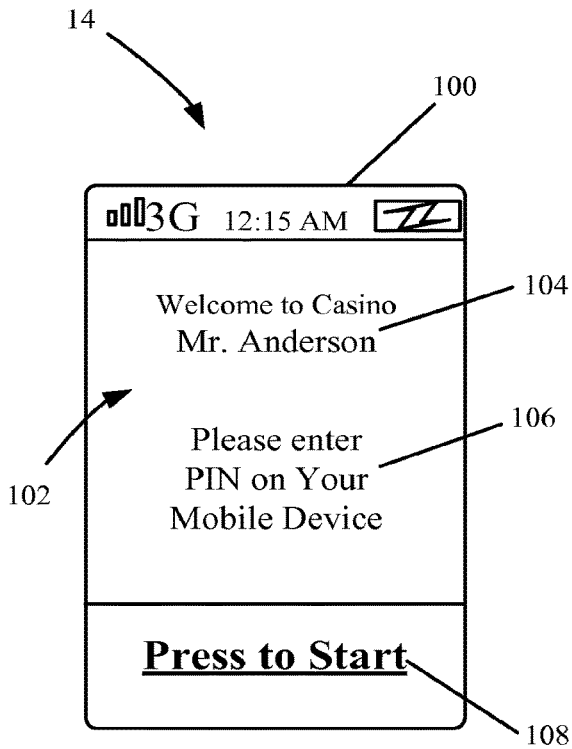


Fig. 2A

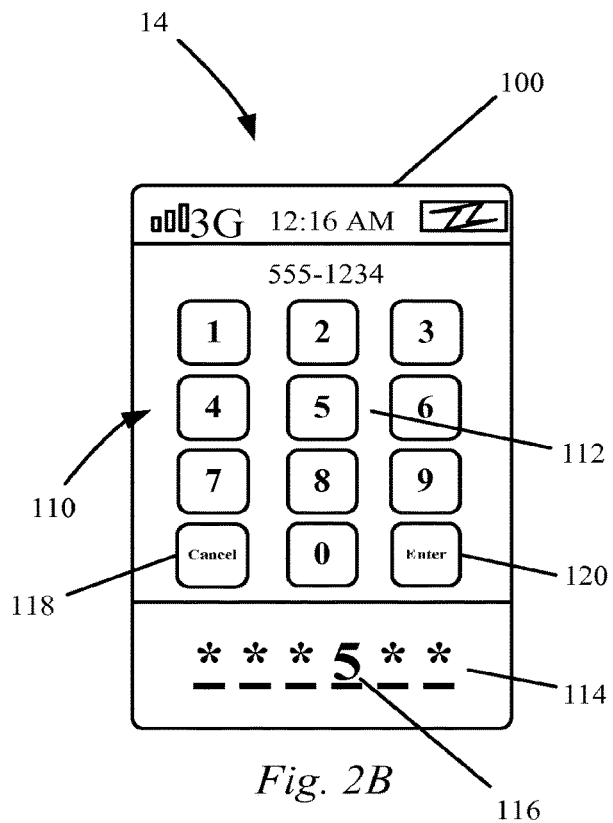


Fig. 2B

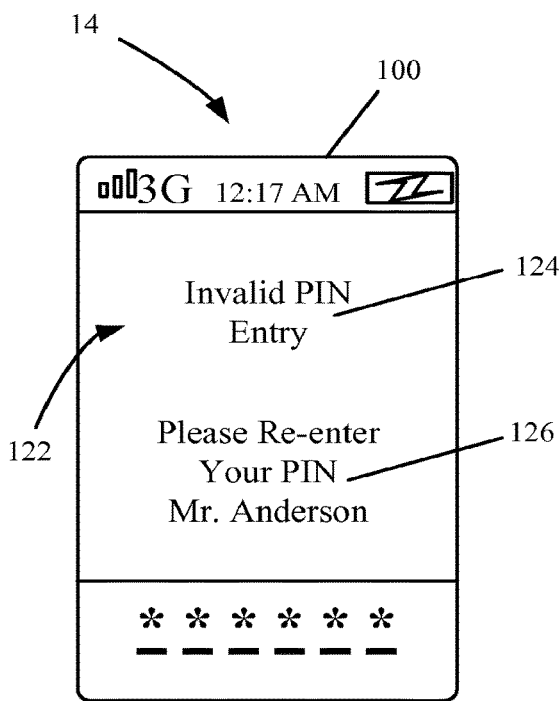


Fig. 2C

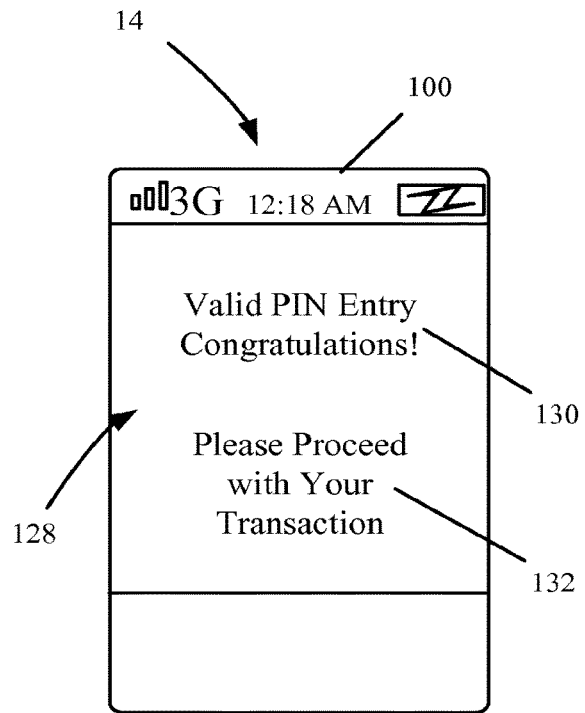
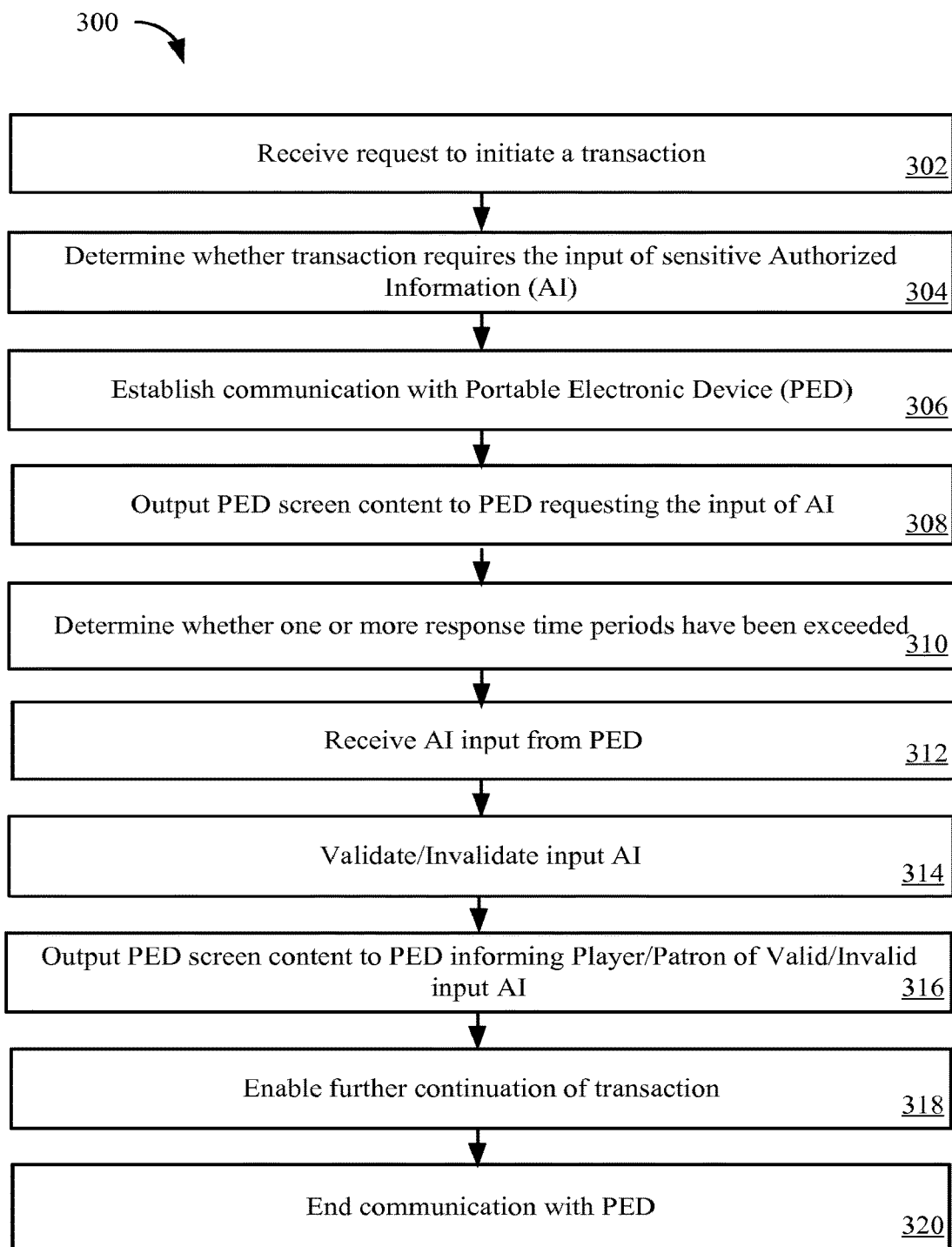


Fig. 2D

*Fig. 3A*

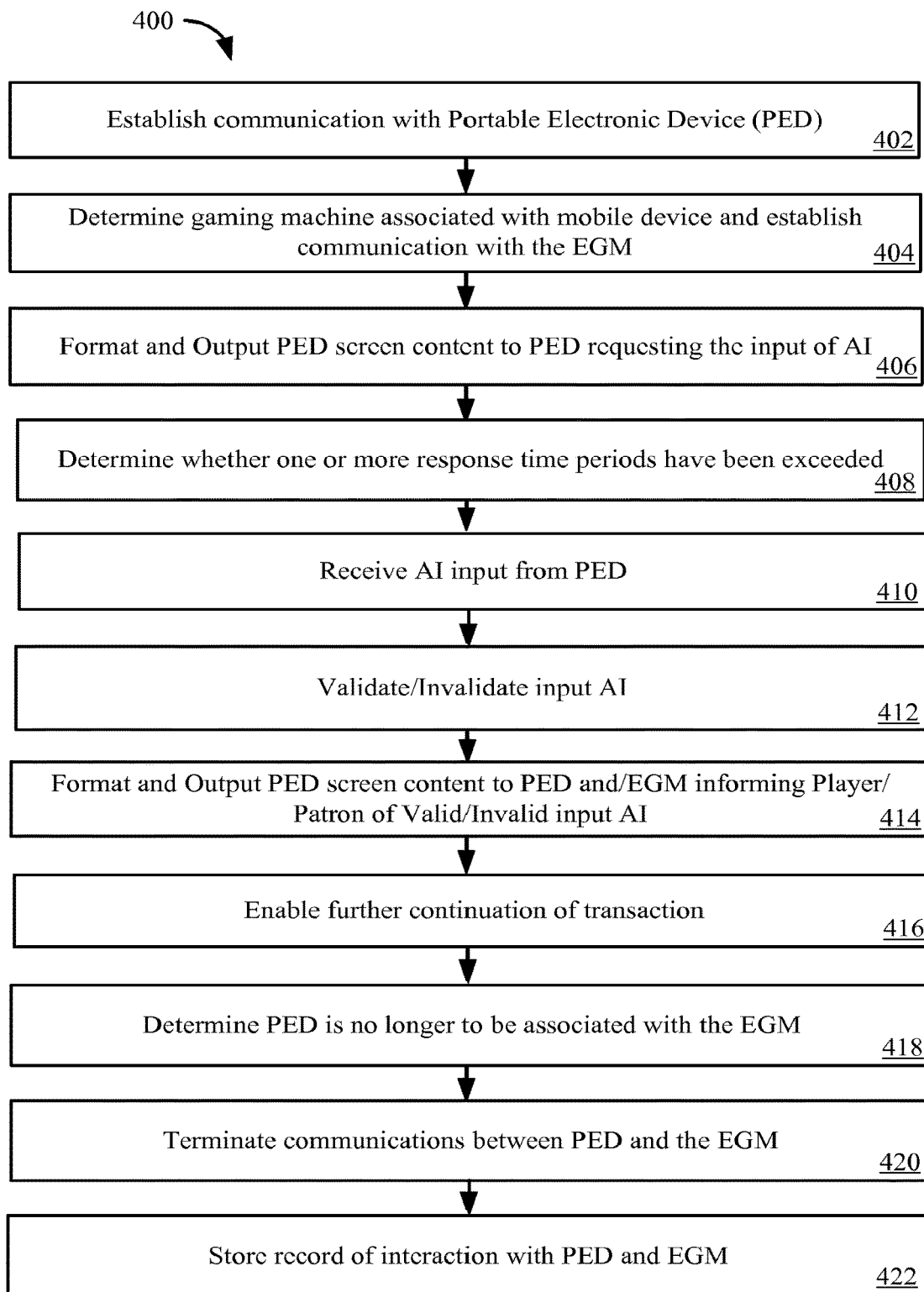


Fig. 3B

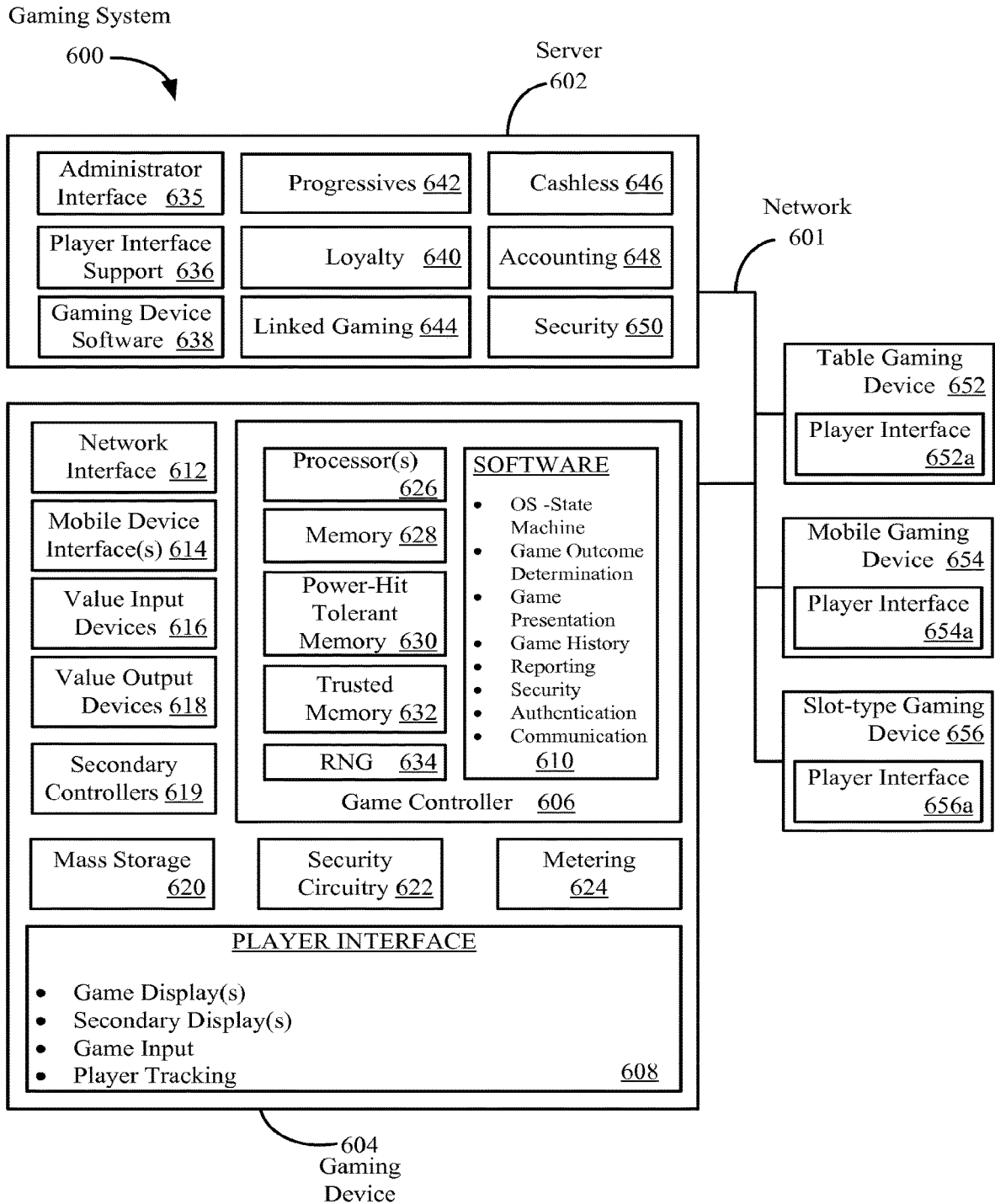


Fig. 4

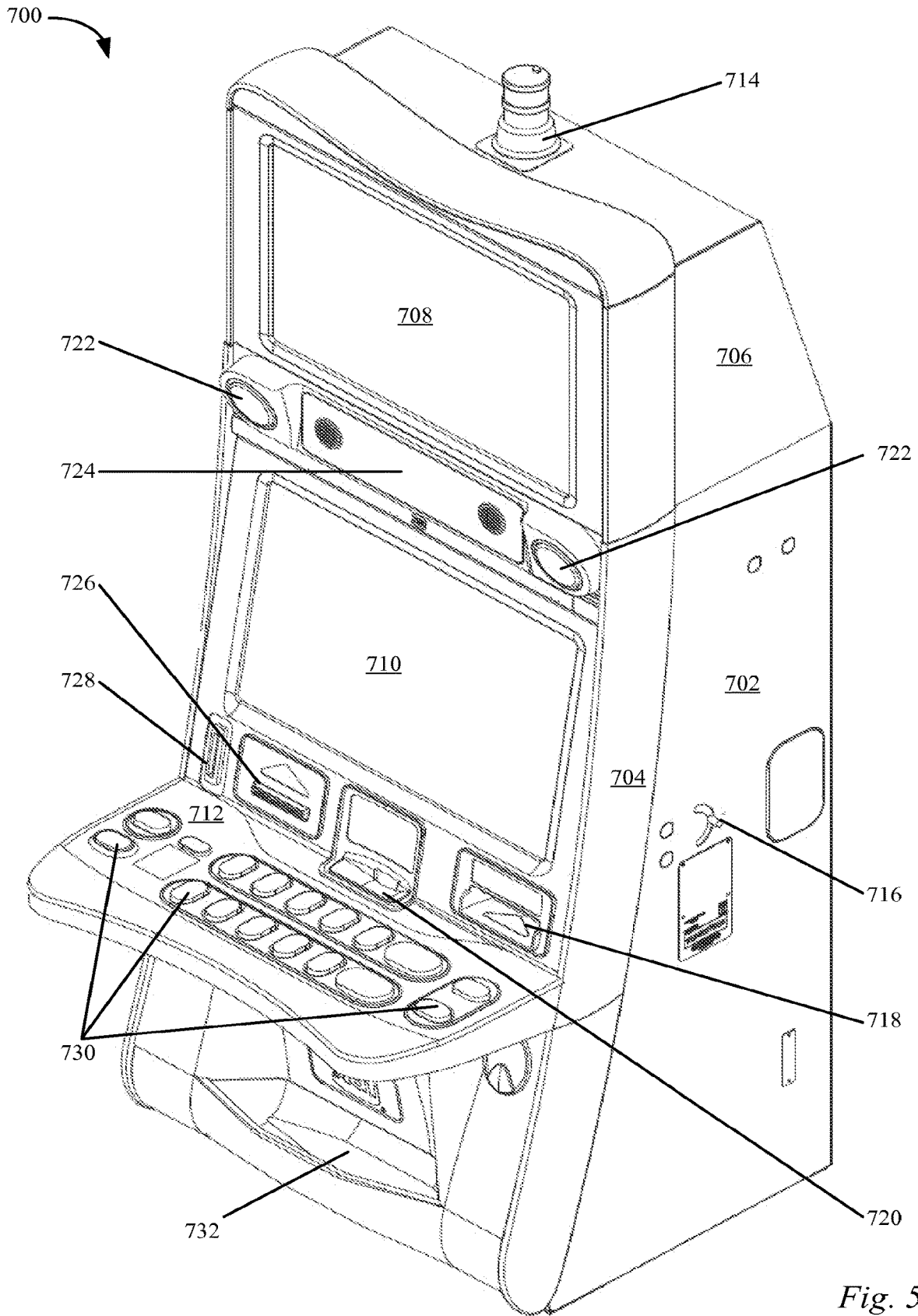


Fig. 5

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**METHODS AND APPARATUS FOR
PROVIDING SECURE LOGON TO A
GAMING MACHINE USING A MOBILE
DEVICE**

PRIORITY CLAIM

This application is a continuation of, claims the benefit of and priority to U.S. patent application Ser. No. 15/270,828, filed on Sep. 20, 2016, which is a continuation of, claims the benefit of and priority to U.S. patent application Ser. No. 14/875,469, filed on Oct. 5, 2015, now U.S. Pat. No. 9,852,578, which is a continuation of, claims the benefit of and priority to U.S. patent application Ser. No. 14/181,372, filed on Feb. 14, 2014, now U.S. Pat. No. 9,875,607, which is a continuation-in-part of, claims the benefit of and priority to U.S. patent application Ser. No. 13/181,725, filed on Jul. 13, 2011 and which is a continuation-in-part of, claims the benefit of and priority to U.S. patent application Ser. No. 13/478,551, filed on May 23, 2012, the entire contents of which are each incorporated by reference herein.

BACKGROUND

Developing and maintaining a loyal customer base is a critical component of operating a successful casino enterprise. To develop a loyal customer base, casino enterprises attempt to generate interactions with their patrons that provide a unique and personalized game playing experience. As an example, casino enterprises offer patrons the opportunity to participate in a loyalty program. Via the loyalty program, patrons are offered various promotions and free items that encourage the patron to return to the casino.

In the loyalty program, the promotions can be tailored to the patron's preferences. As an example, if preferred, a patron can choose to receive promotional credits for game play on an electronic gaming machine and information regarding this preference can be stored to an account associated with the loyalty program. In general, information regarding the patron's preferences in regards to promotions as well as other activities within the casino enterprise, such as food, drink and room preferences, can be stored to their account associated with the loyalty program. The patron information stored in the account can be used to personalize the service and the game playing experience provided by the casino enterprise.

An ever increasing portion of patrons that visit casinos are regularly carrying portable electronic devices, such as smart phones, laptops, netbooks and tablet computers, on their person. The portable electronic devices provide 1) a means of communication allowing the patron to communicate with other individuals within or outside of a casino via a number of different communication modes, 2) a source of news and information, 3) a portal to the patron's on-line activities, such as social media applications, 4) support for entertainment features, such as audio/video playback and gaming applications, 5) a repository for personal information, such as financial information that enables financial transactions in a mobile wallet applications and 6) a means of capturing information, such as video images and audio recordings. Thus, portable electronic devices, such as smart phones, are becoming essential tools and in some instances, the primary electronic interface for many individuals.

The popularity of portable electronic devices allows for the possibility of utilizing their capabilities to further personalize and enhance the gaming experience in a casino gaming environment. In view of the above, methods and

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apparatus are desired that allow for complementary interactions with a portable electronic devices within a casino environment, such as when a patron is participating in game play on an electronic gaming machine.

SUMMARY

A gaming system compatible with patron-controlled portable electronic devices, such as smart phones, portable entertainment electronics, netbooks, laptops, and tablet computers, is described. The gaming system can include a server coupled to a number of different electronic wager-based gaming machines. The EGMs can be located within a single gaming establishment, such as a casino, or the EGMs can be distributed across multiple gaming establishments within a gaming enterprise.

In one specific embodiment, the EGM is configured to receive an initiation of a transaction on the EGM that requires the input of Sensitive Information (SI) for continuance of the transaction, and establish communications with a PED. The EGM is further configured to receive SI data input from the PED, and validate the received input SI data in order to further said continuance of the transaction.

In another embodiment, the EGM is configured to include a wireless interface for direct communications with the PED and established communications are via the wireless interface. The communications are performed with a secure pairing with the PED.

In particular configurations, the communications with the PED are via a remote server in communication with the PED. For instance, the remote server can function as a communication intermediary between an EGM and a PED. In addition, the server can be configured to perform operations that allow SI data to be input and entered from a PED. The server can be located on a casino area network which is internal to the casino, which in turn, casino area network can be isolated from external networks such as the Internet.

In another embodiment, the validation of the input SI data includes comparing the input SI data with stored SI data in either of the EGM and the remote server. In the event that the input SI data is determined valid, the EGM is configured to communicate with the PED informing of the validation of input SI data, and in the event that the input SI data is determined invalid, communicate with the PED informing of the invalidation of the input SI data.

In one particular embodiment, the input SI data may include a wager, a PIN, a password, an account number, biometric input, game play input, social security, a name, a phone number, and an address. The selected transaction requiring the input SI data may include an account login, a player tracking transaction, a cash-out, game play, a cash transfer transaction, a player club operations transaction or an enrollment transaction for a promotion.

In another aspect of the present invention, a computer readable medium is provided for executing computer code on a processor in a wager-based electronic gaming machine that includes computer code for receiving an initiation of a transaction on the EGM that requires the input of Sensitive Information (SI) for continuance of the transaction, and computer code for establishing communications with a PED. The computer readable medium further includes computer code for receiving the input SI data input from the PED; and computer code for validating the input SI data in order to further said continuance of the transaction.

Yet another aspect of the present invention includes a casino server, having a processor and a memory configured to communicate with a plurality of wager-based electronic

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gaming machines (EGMs), configured to receive an initiation of a transaction from an EGM that requires the input of Sensitive Information (SI) for continuance of the transaction, and to establish communications with a PED. The casino server is further configured to receive input SI data input from the PED, and to validate the input SI data in order to further said continuance of the transaction on the server.

BRIEF DESCRIPTION OF THE DRAWINGS

The embodiments will be readily understood by the following detailed description in conjunction with the accompanying drawings, wherein like reference numerals designate like structural elements, and in which:

FIG. 1 shows a block diagram of a gaming system including EGMs, a server and portable electronic devices in accordance with the described embodiments.

FIGS. 2A-2D are block diagrams illustrating mobile or portable electronic screen displays that enable the input of sensitive data for an EGM from the mobile or portable electronic device itself in accordance with the described embodiments.

FIG. 3A is a method in a gaming machine involving the input of personal SI directly from the portable electronic device for use in the EGM transactions in accordance with the described embodiments.

FIG. 3B is a method in a server involving the input of personal SI directly from the portable electronic device for use in server/EGM transactions in accordance with the preferred embodiments.

FIG. 4 shows a block diagram of a gaming device in accordance with the described embodiments.

FIG. 5 shows a perspective drawing of a gaming device in accordance with the described embodiments.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following paper, numerous specific details are set forth to provide a thorough understanding of the concepts underlying the described embodiments. It will be apparent, however, to one skilled in the art that the described embodiments may be practiced without some or all of these specific details. In other instances, well known process steps have not been described in detail in order to avoid unnecessarily obscuring the underlying concepts.

A gaming system compatible with mobile or portable electronic devices controlled by users of the gaming system is described. The gaming system can include a number of features that encourage and enable the use of mobile or portable electronic devices, such as cell phones, smart phones, portable entertainment electronics, netbooks, tablets or laptop computers, in a casino gaming environment. By way of example, for applications requiring secure transactions, the player is currently required to enter their PIN, account, name, address, social security, phone number, etc. or other personal authorization of identification information (i.e., Sensitive Information (SI)) on the EGM screen in order to continue their transaction. In another example, communal games may require the input of their wager or their playing strategies. Such transactions, for instance, include access to the play of communal games, player tracking, accounting, cash-outs, mobile money transfers, general account settings or password or pass code recovery, etc.

Since the EGMs are often oriented adjacent and/or very close to one another, some players/patrons are hesitant about entering their personal or sensitive information directly into

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the EGM where others can easily view the EGM screen and/or observe their key input of their Authorization or Personal Information. In communal games, in another example, a Player/Patron may not desire others to observe their wager, their playing strategies, and especially their cards on the EGM screen. They also may not desire others to observe their credit balance which itself constitutes Sensitive Information. Some players, thus, may be reluctant to enter such information in this manner, and ultimately elect to not participate in the games offered at all.

According to the present invention, therefore, when a transaction on an EGM is initiated that requires the input of Sensitive Information (SI), such SI can be input directly into the keypad (or keyboard) of their own personal Portable Electronic Device (PED) once that device is in secure communication with the EGM or system server. Hence, the entered SI may only be viewed on the significantly smaller display of the portable electronic device where the player can easily shield the keypad and/or display from the view of others. Once the SI is entered into their portable electronic device, such information is then transmitted to the EGM or server where, once validated, enables the patron to continue their secure transaction or game.

Details of embodiments involving the method and apparatus for entering sensitive data (e.g., Sensitive Information) for an Electronic Gaming Machine from a portable electronic device are described with respect to the following figures. Device interactions within a gaming system including EGM-portable electronic device communications are discussed with respect to FIG. 1 where the input of sensitive and personal SI can be input directly on the portable electronic device, and transmitted directly to the EGM and/or system server. With respect to FIGS. 2A-2D, a portable electronic device screen is shown illustrating an example sequence of the input of SI from the portable device. In FIG. 3A, a flowchart is provided showing a method in the EGM related to the input of personal SI direct from the portable electronic device for use in the EGM transaction is described. FIG. 3B, on the other hand, shows a method in a system server related to the input of personal SI direct from the portable electronic device for use in an EGM transaction is described. Finally, with respect to FIGS. 4 and 5, additional details of gaming devices including an EGM and the gaming system are described.

EGM-Portable Electronic Device Interfaces

In this section, some examples of interfaces on an EGM that enable portable electronic device interactions are described. FIG. 1 shows an EGM 2 with interfaces for interacting with a portable electronic device. The EGM 2 can be part of a gaming system that includes a number of gaming devices and servers, such as sever 4. The communication connection 6 between the EGM 2 and the server 4 can be wired, wireless or a combination of wired and wireless communication links depending on the local and/or wide area network topology used within the gaming system. The EGM 2 can include a) displays, such as a main display 26 on which a wager-based game can be output, b) audio devices, such as speaker 24 for outputting sounds from the EGM and c) a player input panel 28 including buttons for making inputs associated with the play of the wager-based game, as well as the input of Sensitive Information (SI). These devices can be controlled by a game controller (not shown) located within the cabinet of the EGM 2. Further details of the EGM's game controller and other gaming related methods that can be utilized within the gaming system are described with respect to FIGS. 4 and 5.

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The EGM 2 can include a number of different types of interfaces that enable interactions with a mobile or portable electronic device, such as a cell phone, a smart phone, a laptop or a tablet computer. One type of interface is a power interface. Another type of interface, described in more detail below is a communication interface which is the interface utilized in the present invention. Via a power interface, power can be supplied to the portable electronic device. For instance, power interfaces 32 and 34 can be configured to receive a connector that allows an electronic device to be electrically coupled to the EGM 2. In one embodiment, the power interface 32 and 34 can be configured to accept a USB connector and thus, can be compatible with USB connector power requirements. Other types of power interfaces, such as a standard 120V receptacle can be provided.

In general, one or more power interfaces can be provided. When two or more power interfaces are provided the interfaces can employ the same or different power configurations. For instance, when two interfaces are provided, both can be configured to accept a USB connector or a first can be configured to be compatible with a USB connector while a second can be compatible with a two pronged connector. Thus, the voltage and current supplied by each power interface can vary from interface to interface depending on the power standard for which the power interface is configured. The one or more power interfaces can be located on different surfaces of the EGM 2. For instance, power interface 32 is located on an upper surface of the player input panel 28 and power interface 34 is located on a front surface of the player input panel 28. In other examples, the power interfaces can be located on a different surface, such as a front surface of the EGM cabinet.

A connector 18 is shown leading from power interface 32 to portable electronic device (PED) 14 positioned on the player input panel 28 and a connector 20 is shown leading from power interface 20 to a portable device (not shown) located in the pocket 10 of user 8. At the device end, the connector, such as 18 or 20, can include a power interface compatible with the portable device, such as device 14 or the device located in the pocket of user 8. At the EGM end, the connector, such as 18 or 20, can include a power interface compatible with the EGM power interface. The interfaces at each end of the connector can be coupled via a cord. Typically, the interface between a connector (e.g., 18 or 20) and a portable device varies widely from model to model and from manufacturer to manufacturer where the interface at the device end can transmit communications and/or power to the portable device. Thus, in one embodiment, the connector, such as 18 and 20, can be provided by the user, such as 8.

In yet another embodiment, an interface 30 for wireless power transmission can be provided on the EGM 2. As an example, player input panel 28 includes a wireless power interface 30, such as a Powermat™ (Powermat Inc, Commerce Charter Township, Mich.). The wireless power interface can be compatible with a number of different types of devices. A portable device 16 is shown resting on the wireless power interface in a position that allows it to receive power via the wireless power interface 30. Power to the wireless power interface can be switched on and off depending on the machine status.

In particular embodiments, the interfaces 30, 32 and 34 can include sealing mechanisms that are configured to protect the interface in the case of spill, such as a user spilling a drink on the interface. Further, the interfaces can be configured to protect against electrostatic discharge (ESD). The ESD protection can include isolation circuits,

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filtering circuits, and suppression components, such as multilayer varistors, silicon diodes, and polymer-based suppressors. Suppression components protect the circuit by clamping the ESD voltage to a level that the circuit can survive. Connected in parallel with the signal lines, the suppressors clamp the ESD voltage and shunt the majority of the ESD current away from the data line, and the protected chip, to the appropriate reference. Typical references are the power rail and chassis ground.

In alternate embodiments, one or more of the interfaces 30, 32 and 34, can be configured as power and data interfaces or as a data only interface. For instance, via interface 32 and connector 18, power and data can be transmitted from the EGM 2 to the portable electronic device (PED) 14 or only data can be transmitted between the EGM 2 and the PED 14. In one embodiment, for security purposes, when a data interface is provided, the communications can be unidirectional such that only data can be sent from the EGM 2 to the portable device via the data interface. In other embodiments, the return communications that can be sent from the device to the EGM 2 and recognized by the game controller can be very limited for security purposes. The format of the return communications can be described by a communication protocol (and/or implemented with an application program interface).

The EGM 2 can support one or more wireless communication interfaces for communicating with a PED, such as 14 or 16. For instance, a first communication wireless interface can support Bluetooth™ communications, a second wireless communication interface can support communications via Wi-Fi™ (compatible with IEEE 802.11 standards) and a third wireless communication interface can support a NFC communication protocol (see FIG. 4 for more detail). In one embodiment, a wireless communication interface can be integrated or located proximate to the wireless power interface. For example, a wireless communication interface supporting an NFC communication protocol can be integrated with the wireless power interface 30. Thus, when the device 16 is placed near the wireless communication interface 30, NFC formatted communication can occur between the device 16 and the EGM 2. In other embodiments, the wireless communication interfaces can be placed in other locations within the EGM 2. Thus, the placement near the wireless power interface is discussed for the purposes of illustration only.

In one embodiment, the NFC communication can be used to exchange information to allow a secure pairing to be established between a user-controlled device and the EGM 2. For instance, Bluetooth™ pairing occurs when two Bluetooth devices agree to communicate with each other and establish a connection. In order to pair two Bluetooth wireless devices, a password (passkey) is exchanged between the two devices. The Passkey is a code shared by both Bluetooth devices, which proves that both users have agreed to pair with each other. After the passkey code is exchanged, an encrypted communication can be set up between the pair devices. In Wi-Fi pairing, every pairing can be set up with WPA2 encryption or another type of encryption scheme to keep the transfer private. Wi-Fi Direct is an example of a protocol that can be used to establish point-to-point communications between two Wi-Fi devices. The protocol allows for a Wi-Fi device pair directly with another without having to first join a local network. The method makes it possible to share media from a phone, play multiplayer games or otherwise communicate directly, even when no router exists. Via pairing between the EGM 2 and portable electronic device, a portable electronic device may

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be able to utilize some of the functionality of secondary devices residing on the EGM 2. For instance, it may be possible for a player to print something from their portable electronic device using the printer on the EGM 2 when it is paired to the EGM 2.

The EGM 2 can include one or more support structures configured to receive a portable electronic device. The support structures can be integrated into the EGM cabinet such that a device placed in the support structure isn't easily knocked out of the support structure and placement of the device doesn't block access to input buttons on the EGM 2 during game play. The support structure can be configured to support a device various positions, such as upright, on its side or on its back. Further, the support structures can be configured to allow a device received in the support structure to be positioned in a preferred orientation. For instance, device 14 is placed in a support structure with a receptacle built into the player input panel 28 that allows the device to be orientated in an upright position. As another example, device 16 is placed flat on a ledge of the player input panel 28. The ledge can include an indentation or a high-friction material (anti-slip) that is designed to keep the device 16 from sliding off of the ledge. Support structures can be placed in other locations on the EGM cabinet and these examples are provided for the purposes of illustration only.

The support structure can include a stand or bracket for supporting the device. In one embodiment, the support structure can include a switch that is activated by a weight of the portable electronic device. The switch may be used for device detection purposes. The support structure can be sealed to provide protection in the event of spills. Further, it can include other tamper-resistant features, such as features that prevent the internal elements of the EGM 2 from being exposed. In one embodiment, a NFC interface can be located proximate to the support structure, such that it can be utilized when a device is placed in the support structure.

In alternate embodiments, the support structure, data interfaces and power interfaces can be incorporated into a secondary device utilized on the EGM 2. For instance, one or more of a support structure, a power interface or a wireless interface can be incorporated into a player tracking unit with a smart interface board (SMIB), a card reader, a bill validator or a printer. Further, all or a portion of the control of the power interfaces and/or wireless interface in the manner described herein can be performed by a secondary processor on the secondary device in conjunction with or independently of the game controller on the EGM 2. In another embodiment, all or a portion of the control of the power interfaces and/or wireless can be implemented in a "service window" type architecture (see FIG. 4 for more details).

In particular embodiments, the EGM 2 can be configured to provide indicators of a status of a power and/or data interface. For instance, in one embodiment, when a power and/or data interface is active, an icon indicating a status of the interface can be displayed on the EGM 2. For example, a lightning bolt 36 is shown on display 26 to indicate that power is actively being supplied to one of the power interfaces. Similarly, another icon can be displayed to represent an active communication session via a communication interface, such as a communication interface involving a wired or wireless connection between the EGM 2 and a PED.

In other embodiments, an interface, such as 30, 32 and 34, can be surrounded by lighted bezel, partially surrounded by a lighted bezel or include an indicator light near the interface. The lighted bezel can be configured to change color,

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emit a particular lighting pattern or combinations, such as flashing or steady, to indicate that the power interface is delivering power. For instance, a bezel or indicator can be lighted with a green color when power is being delivered to the interface and a red color when power is cut-off to the interface. In another example, a status light can be turned on when power is being delivered via the interface and turned off when power is not being supplied. Similar, status indicators can be used for communication interfaces to indicate an active or non-active communication session. For instance, the lighted bezel and/or audio feedback can be used to indicate proper device pairing, secure communications and/or recognition and successful establishment of communications.

Other types of feedback mechanisms can be utilized to indicate a status of an interface. For instance, audio devices can be used to provide audio feedback and/or vibration generating devices, which can also produce an audible buzz, can be used to provide feedback. These feedback mechanisms can be used alone or in combination with other feedback mechanisms, such as a light generating mechanism, to indicate the status of various processes implemented on the EGM 2.

In particular embodiments, the EGM 2 can be configured to detect the presence of a PED and/or user and encourage the user to retrieve their PED at the end of a game play session. For instance, the EGM 2 can include a camera, such as 40, with a field of view including the player input panel 28. Using image recognition software, the game controller can be configured to recognize an object, such as but not limited to a PED, left on the input panel 28. Image data received from a camera may also be used to recognize the presence of a user at the EGM 2 and possibly for eye tracking purposes. In one embodiment, a camera can be placed with a field of view of base of the EGM 2, such as the floor area beneath input panel 28. Image data from this camera can be used to recognize objects left on the floor of the EGM 2 near its base, such as a portable electronic or wallet that has fell onto the floor or a purse/bag left at the EGM 2. As described above, the presence of a PED can also be determined via signal strength and/or triangulation.

When a PED is detected near the EGM 2, the game controller can be configured, after certain game events, to notify a player to retrieve and/or disconnect their device from the EGM 2. For instance, after a cashout command is received by the game controller, the gaming controller can be configured to display a message 38, such as "Don't forget your Mobile Device." As another example, the EGM 2 can be configured to emit a sound effect, such as a beeping to get the user's attention in regards to retrieving a device. In yet another example, the EGM 2 configured to flash lights in a distinctive pattern to get the user's attention.

EGM-Portable Electronic Device-User Interactions

Next with respect to FIG. 1, user interactions with EGM 2 that can lead to a communication connection between the EGM 2 and PEDs, such as 14 and 16, are described. Further, connection schemes that can be utilized between the PED and the EGM 2 are described. A user 8 with a PED, such as 14 and 16, can approach EGM 2 to play a wager-based game. The EGM 2 includes an upper video display 25 and lower video display 26 disposed in a secure cabinet 5 with locking mechanisms. The lower video display 26 can be used to display video images associated with the play of a wager-based game, such as a game outcome presentation. The upper video display 25 can be used to display attract features and a bonus game outcome presentation that is triggered from the play of the wager-based game on the

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lower video display 26. One or both of the upper video display 25 and lower video display 26 can include touch screens. In one embodiment, a portion of the video display screens can be allocated for control a remote device, such as server 4. This embodiment can be referred to as a service window and is described in more detail below with respect to FIG. 4.

To start game play, credits are first deposited on the EGM 2 that can be used for wagers. For instance, currency or a ticket voucher redeemable for credits can be inserted in bill acceptor 35. The ticket voucher can be validated by a remote server in the gaming system, such as 4. As another example, information can be transferred from the PEDs, 14 or 16, to the EGM 2. The EGM 2 can include wireless and/or wired interfaces that enable communications between the EGM 2 and the PEDs to be established.

The PEDs, such as 14 or 16, can be configured as an electronic wallet and the information transfer can be used to initiate an electronic funds transfer that results in credits being deposited on the EGM 2. The use of the PED in for these transactions can alert the EGM 2 to the presence of the PED. In response to the use of PEDs for these purposes, the EGM 2 may attempt to initiate communications with the PED that allow it to use the PED's wide area network access capabilities.

Whether credits are deposited via a tangible medium, such as a ticket voucher or paper currency, or electronically, such as via the PED, the user is likely to be near the front of the EGM 2. Thus, if they are carrying a PED, it is likely to be in the general area of the EGM 2. For example, the PED is likely to be at least an arm's length distance from the EGM 2. Thus, the EGM 2 can establish a connection with the PED 14 or 16 that can be used to facilitate a connection with a remote device via wide area networking capabilities provided by the PED 14 or 16.

After depositing credits, a player can make a wager and initiate a game on the EGM 2. The input panel 28 can be used to make selections related to the play of the game, such as a wager amount, and initiate the game. After the game is initiated, a game outcome presentation can be generated on EGM 2. It can include video images output to the displays and accompanying sound effects. For example, during a video slot game played on EGM 2, the game controller can generate a game presentation including a series of video images that show at different times an amount wagered on the game, symbols moving and then stopping in a final position and an award amount associated with game based upon the amount wagered and the final position of the symbols.

In some instances, after depositing credits, typically before beginning game play, a player can initiate a player tracking session on the EGM 2. During a player tracking session, information associated with game play, such as amounts wagered and amounts won can be stored to a player tracking account. This information is often referred to as player tracking information. To encourage repeat business, gaming enterprises often provide complimentary awards ("comps"), such as free meals and lodging, to players. The value of the comp can depend on the value of the player to the casino based upon their player tracking information, such as amounts wagered over time.

The player tracking account can be associated with the user that has initiated game play on EGM 2 and can be hosted on a remote device, such as server. The player can initiate a player tracking session by providing player tracking account information that allows their player tracking account to be located on a device that hosts player tracking

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accounts. In one embodiment, the player tracking account information can be stored on the PEDs, 14 or 16, and transmitted to the EGM via a compatible communication interface. In another embodiment, the player tracking account information can be stored on a card that can be read by card reader 15. In yet another embodiment, a service window application can be used to enter player tracking account information.

In other embodiments, the EGM 2 can be configured to detect nearby PEDs for the purposes of initiated an attract feature that encourages the player to engage in game play at the EGM 2. Thus, the EGM 2 can be aware of nearby PEDs associated with users not using the EGM 2. These PEDs may be associated with patrons walking near the EGM 2, standing near the EGM 2 or playing a game on a nearby gaming machine. The ability to detect or be made aware of nearby PEDs can be provided independently of whether attract features are provided.

In general, when a nearby PED is detected or the EGM 2 is made aware of a nearby PED (e.g., another device may detect the presence of the PED and transmit the information to the EGM), the EGM 2 may attempt to establish communications with the device. In one embodiment, the EGM 2 can be configured to contact and attempt to access the wide area network capabilities of a PED. For instance, the EGM 2 can be configured to contact a PED associated with a player utilizing the EGM 2 use the wide area network capabilities of the PED to communicate with a remote device, such as a remote server.

During game play, the EGM 2 can be configured to send information to the PEDs, such as 14 or 16, that is for a player's personal use. For instance, the EGM 2 can be configured to send a copy of a screen displayed on 25 or 26 showing the outcome of the game or a bonus game. The player can save this screen copy as a keepsake and may optionally upload it to a social media site. Further, the EGM 2 can be configured to receive information from the PED that affects the game play. For instance, the EGM 2 can be configured to receive player tracking information, voucher information and/or player preference information that allows the gaming experience to be customized for a particular player. Thus, the EGM 2 can be configured to interact with a PED to send data intended for storage on the PED as well as to send data to the PED that is intended for a remote device.

The EGM 2 can be configured to detect PEDs carried by employees of the gaming operator that move throughout the casino floor. In one embodiment, the EGM 2 can be configured to contact these devices for the purposes of utilizing their network access capabilities. These devices can transmit information that allows them to be identified by the EGM 2. In one embodiment, the EGM 2 can be configured to only utilize specially designated devices, such as devices carried by operator employees for the purposes of accessing and engaging in communications with devices on a wide area network, such as the Internet. In yet another embodiment, which is described in more detail below, user devices can be required to have a particular application installed, such as an application provided by the gaming operator, before the PEDs can be utilized for accessing a wide area network.

In yet another embodiment, a wireless or wired interface can be located within the EGM cabinet that can be used to communicate with a PED. The EGM 2 can be configured such that the wireless or wired interface is only activated when the interior of the EGM 2 has been accessed in an authorized manner. The EGM 2 may be configured to only permit communications via this interface when the EGM 2

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is an operator mode, such as when the cabinet has been opened via an approved procedure. At other times, the EGM 2 may not be configured to communicate with remote device via a wide area network.

Communications Topologies in a Gaming System Including Portable Electronic Devices

In this section, different communication topologies involving PEDs in a gaming system are described. In one embodiment, PEDs, such as 14 or 16, can communicate directly with the EGM. For example, as described above, the communications can be through a wired or wireless interface available on the EGM. Via an EGM to PED communication interface, the PED may be able to communicate with the game controller on the EGM, a secondary controller on the EGM, a remote device, such as server 4 or combinations thereof. Examples of a secondary controller include but are not limited to a player tracking controller, a card reader controller, a bill validator controller or a printer controller. In the case of the remote device, such as server 4, the EGM 2 can act as an intermediary in the communications.

In one embodiment, for security purposes, the EGM 2 can be configured to not allow direct communications between the game controller and the PED. For example, the PED may communicate with a secondary controller in a secondary device coupled to the EGM, such as a card reader controller in a card reader. The secondary controller may include a communication interface that allows it to communicate with a remote device, such as server 4. In a particular embodiment, the communications between the secondary controller and the game controller can be well defined to limit the type of information that is transferred the secondary controller and the game controller. Depending on how the communications are defined, the EGM 2 may be able to receive a limited types of information or not any information from the PED via the secondary controller.

In another embodiment, the communications between the PED and the EGM 2 can be uni-directional. For example, the EGM can be configured to directly send information to the PEDs, such as 14 or 16, but not directly receive information from the PED. In one embodiment, information can be sent from a PED to an EGM 2 via an intermediary device, such as server 4 or a secondary device, such as card reader 15. The intermediary device can be configured to screen and limit the information from the PED that can be received by the EGM 2.

In yet other embodiments, the EGM 2 and the PEDs may only communicate indirectly using the communication capabilities associated with a PED. For example, PEDs may be able to establish communication connection with server 4 which then acts as intermediary for communications between the PEDs, such as 14 and 16, and EGM 2. The EGM 2 can be configured to output information via a display device or some other mechanism that enables the indirect PED to EGM communications via an intermediary device, such as server 4, via a local area network, such as 6, or via a wide area network, such as 52. For example, the EGM can be configured to output a QR code that a PED can scan. Information embedded in the QR code can allow the PED to establish communications with the EGM 2 via server 4, local area network 6 or wide area network 52.

The PEDs can communicate with a device, such as server 4, using one of its inherent communication capabilities. The mode of communication that is used can vary depending on the communication networks 50 that are available to the PEDs. For example, the server 4 and EGM 2 can be located on a local area network, such as a local area network 6 within a casino. The local area network can be a private

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network only accessible from the casino and its vicinity. Via wireless access point 54, the PED can access the local area network, such as 6 to access the server 4 or optionally EGM 2. Thus, via wireless access point 54, the PED may be able to communicate with 1) a server 4, 2) an EGM 2 where the server 4 acts as intermediary in the communications or 3) directly with the EGM 2 via the local area network 6.

In other embodiments, the server 4 and/or the EGM 2 can access a wide area network, such as the Internet 52 and have an Internet address. Via the wireless access point 54 or a cellular data connection 56, the PED, such as 14 or 16, can access the Internet 52 to establish communications with server 4 or EGM 2. Again, the server 4 can act as intermediary in the communications between the PED and the EGM 2. Thus, the PEDs can establish communications with server 4 via the Internet 52 and then, the server 4 can establish communications with the EGM 2 using an alternative method.

In various embodiments, different EGMs in a gaming system can be provided with different communication capabilities. Thus, a combination of the communication topologies used above can be used for communications between PEDs and EGMs in a gaming system. For instance, a PED can communicate with a first EGM via a direct wireless connection between the first EGM and the PED and then communicate with a second EGM via a wireless access point that connects to a local area network on which the second EGM is located.

Entering Sensitive Information for an Electronic Gaming Machine from a Portable Electronic Device

In accordance with the present invention, details of EGMs, gaming systems and the Portable Electronic Devices (PED) are described with respect to FIGS. 1, 2A-2D, and the flow diagrams of FIGS. 3A and 3B. Initially, a player/patron may initiate a transaction on an EGM 2 that requires the input of Sensitive Information (SI) in order to further continuance of that transaction. Such secure transactions, for example, include, but are not limited to, the commencement or continuance of game play, player tracking transactions, accounting transactions, cash-outs, cash transfer transactions, player club operation transactions or an enrollment transaction for a promotion, etc.

Due in part to the close proximity of the EGMs relative to one another, some patrons are reluctant to enter their SI in front of other patrons, and may elect to forego participation on the EGM all together. Accordingly, by enabling the input of such SI directly onto their own PED (e.g., PED 14, which will be the only one discussed henceforth for the ease of description), which is in direct communication with the EGM, such input is significantly more discrete, and out generally of the plain view of other patrons.

Once a transaction has been initiated on the EGM 2, depending upon the specific transaction requiring player information, the EGM and/or system server 4 will determine whether or not the player information is SI or not. Should the required player information not be determines SI, the EGM 2 may enable input of such information directly on the EGM using the player input panel 28 and/or other input controls.

In accordance with the present invention, however, should the required player input information include SI, then the communication between the EGM (and/or system server 4) and the PED 14 may commence in order to enable input of the SI data directly on their PED (E.g., FIGS. 2A-2D). In one embodiment, to establish communication, the player/patron may simply execute a mobile app from their PED that was previously downloaded from one of the various mobile application sites, depending upon whether the mobile OS is

Apple, Android, Blackberry, Palm or Microsoft based, etc. Using such an executable application installed on the mobile device that enables aforementioned SI input features, the EGM can effectively communicate with the mobile application to enable the SI exchanged.

In other embodiments, an installed mobile application may not be desirable given the various mobile device platforms (e.g., Android, Iphone, etc.) or the player/patron simply not wanting a gaming application on their PED. In these versions, the EGM 2 and/or the system server 4 could commence communication with the PED 14 using at least two different technologies. Applying a standard communication protocol/technology, the EGM can communicate directly with the PED's web browser, using HTML. For example, once Player/Patron has entered the SI into the PED, the SI is forwarded to the EGM through HTML using the PED's web browser.

Another applicable communication technology that can be applied, without the need for a mobile application, involves the use of standard communication protocol/technology between the EGM 2, PED 14 and system server 4, wherein the server is further in communication with a third party server. For instance, EGM 2 communicates with Server 4, notifying the server to permit the PED 14 to communicate and connect to the EGM/Server so that SI can be entered via the PED. Next, the EGM/Server, forwards a standard URL to the mobile device which could be the address for a simple web site on system Server 4. The PED can then connect to the Server 4, via HTML provided by the EGM 2.

Using the latter technique, by way of example, once communication is established, the player then enters the SI into the web page hosted by the Server (via the PED). The information entered by the player is communicated to the mobile device either 1) directly from the Server to the EGM, or 2) it could be provided to the mobile device and the mobile device communicates that back to the EGM. Direct communication between the PED and the Server 4 is preferred in that communication path doesn't require that an application be installed on the PED.

Referring now to FIGS. 2A-2D, once communication between the PED 14 and the EGM/Server has commenced and been established, using at least one of the above mentioned techniques and technologies, a Greet Screen 102 (e.g., FIG. 2A) can be formatted and output to the PED 14 for viewing on the PED's display 100. In one configuration, the resolution, size, aspect ratio, etc., of the SI input screens of FIGS. 2A-2D, can be formatted and output in a lower quality, more universal format that is capable of being displayed on a wide range of PED displays 100, regardless of the display's resolution, size, aspect ratio, etc.

Alternatively, the EGM/Server can customize, adjust and/or scale the resolution, size, aspect ratio, etc. of the outputted SI input screens, of FIGS. 2A-2D, to match those of the particular display screen of the PED. Such screen customization, of course, is the more aesthetically pleasing.

Referring back to FIG. 2A the initial Greeting Screen 102 can be rendered and output to the PED for viewing on the display 100. Should the player/patron be identified, a customized greeting message 104, such as "Welcome to Casino Mr. Anderson" can be included. It will be appreciated that any other greeting can be incorporated of course.

A general query to input the SI data is also prominently placed on the Greeting Screen 102. This facilitates the ease of input and use by the player/patron, informing them what input SI data is required. For example, the Greeting Screen 102 includes a request to "Please enter PIN on Your Mobile

Device" message 106. Briefly, in the examples of FIGS. 2A-2D, the requested SI data for input is a PIN although it will be appreciated that any form of SI could be requested. As mentioned, such input SI data includes, but is not limited to, the patrons account, name, address, social security, password, phone number, biometric input, etc. or any other personal identification information.

Depending upon the type of PED and its' input controls (i.e., whether the device includes a hard numbered keypad, a keyboard, a touch sensitive display and/or combination thereof), how the actual entrance of the input SI data may vary from device to device. In the examples of FIGS. 2A-2D, the PED 14 incorporates a full touch screen style input. Therefore, to advance to the next input screen, the patron may have to contact the "Press to Start" message 108 or some other form for screen continuance.

Advancing from the Greet Screen 102 (FIG. 2A) to the SI Input Screen 110 of FIG. 2B, a touch screen number keypad 112 (or a keyboard depending upon what input SI may be required) may be illustrated. Below the keypad 112 on PED display 100 is an SI display region 114 for display of the input SI data, whether it requires numbers, letters, symbols, biometric data or a combination thereof. In the SI display region 114 of FIG. 2B, for example, six data slots are illustrated, the number of which can vary of course.

To further hide or shield entry of the sensitive input SI data in the input slots, even though such input SI data is entered for viewing only on the smaller display 100, each entry may only be presented momentarily (i.e., the fourth data slot 116) before being replaced by a "*" symbol or the like.

A "Cancel" button 118 or a "Backspace" button (not shown) may be incorporated to correct any input errors or to "cancel" the SI input altogether. However, should the player/patron complete their input SI data entry, they may execute the "Enter" button 120 (or similar means) to transmit and output the input SI data to the EGM/Server.

Applying conventional validation/invalidation comparison technology, the validation of the input SI data may be assessed. Should the input SI data be determined "Invalid" for whatever reason, an Invalidation Screen 122 may be rendered on the PED display 100, as shown in FIG. 2C. A simple invalidation message such as an "Invalid PIN Entry" message 124 can be displayed for information, as well as a "Please Re-enter Your PIN" message 126 before reverting back to the SI input Screen 110 as best viewed in FIG. 2B. The Player/Patron may then reenter their sensitive input SI data again.

In one specific embodiment, the validation could be performed in-part on the PED itself. Using HTML, the client on the PED performs partial validation of the data, and then the server still requires validation. For example the client might prompt the Play/Patron for a number, which may relate to the Play/Patron's age. The client on the PED compares the PED stored number to the input SI (e.g., only validating when values 0 through 9 are entered and not when letters are entered). The client, for instance, might even check that the input age is greater than one and less than 150. The server would likely perform the same check but also compare the age against a database for the user.

Similar to other forms of sensitive personal identification information, should an invalid entry continue a predetermined number of attempts (e.g., 4 or 5 consecutive attempts), the system may "lock-out" further entry of input SI data from that PED for a predetermined period of time or

until other circumstances are met. These other circumstances may include a password or pass code reset or other verification techniques.

Should the input SI data be determined “Valid” by the EGM/Server, a Validation Screen **128**, such as that shown in FIG. 2D, may be rendered on the PED display **100**. Again, a simple validation message may be displayed such as a “Valid PIN Entry Congratulations!” message **130**. Once the Player/Patron has been informed of their validation, they may proceed with the furtherance of their transaction, either on the PED itself or on the EGM. For instance, the Player/Patron may be informed of such furtherance by a “Please Proceed with Your Transaction” message **132** on the PED display **100**.

In one configuration, should the SI input cycle be complete, the EGM/Server, or the PED mobile application, may timeout, reverting the PED back to the home screen or the like. Moreover, should the Player/Patron be required to reenter the input SI data on their PED, such in SI data may be stored, and automatically complete entry of the input SI data in the data slots of the SI display region **114**.

Methods in an EGM and Server

Next details of a method on an EGM and server involving the input of Sensitive Information (SI) for the EGM on a Mobile or Portable Electronic Device (PED) are described. FIG. 3A, for instance, illustrates a method **300** in an EGM for entering such SI from the PED. In **302**, a request is received from an EGM **2** (FIG. 1) to initiate a transaction. For instance, the player/patron at the EGM **2** may operate the player input panel **28**, including buttons for making inputs associated with the play of the wager-based game, to request any information. Some requested information and transactions may not require the input of SI data, to further continue the transaction, such as dining requests, game selection, game operation, chatting, beverage selection or browsing casino offerings. However, as mentioned above, many transactions do require the input of SI, such as the play of communal games, player tracking transactions, accounting transactions, cash-out transactions, mobile money transfers transaction, general account settings transactions, and/or password or pass code recovery transactions, etc.

Accordingly, at **304** of FIG. 3A, the EGM can analyze the requested transaction to determine whether or not the input of SI is even necessary, in this instance. That is, should the requested transaction not require SI, then the EGM can permit the completion of the transaction through the operation of the controls on the input panel **28**.

However, in accordance with the present invention, should the requested transaction require the input of SI data, at **306**, communications can be established with a PED. In one embodiment, a secure pairing between the PED and the EGM can be established using a protocol such as Bluetooth™ or Wi-Fi. If present, an NFC enabled communication interface on the EGM can be used to transfer information that allows a secure pairing to be established. In another embodiment, communications between the mobile device and the EGM can be enabled via an intermediary device. For instance, communications can first be established between a mobile device and a remote server and then communications can be established between the remote server and the EGM such that information can be transmitted between the EGM and the mobile device.

After the initial communications are established, the EGM and mobile device can exchange information. In one specific configuration, the Greet Screen **102** or interface of FIG. 2A, for example, may be output to the PED **14**. In **308** of FIG. 3A, the screen resolution, aspect ratio, font size, etc.,

may be adjusted by the EGM, depending upon the particular screen display properties of the PED. Upon receiving a continuation signal (e.g., press of the “Start” region **108**), the EGM can output the SI Input Screen **110** of FIG. 2B.

In either event, a predetermine response time period will commence once each screen is output to the PED for viewing on the PED display **100**. In **310** of FIG. 3A, thus, the EGM **2** will determine whether one or more response time periods have been exceeded. Should the Player/Patron fail to input any information or fail to input any key stroke on the PED display after the predetermined time period (e.g., 2 minutes), the EGM will automatically “timeout”, ending the transaction. In one embodiment, the system can inform the Player/Patron of the “timeout” on the PED display and/or the EGM display, and then perhaps revert to the EGM Home Screen or in the like.

Similarly, in the event of a failed or broken communication between the EGM and the PED, the EGM will also “timeout”, ending the transaction. In this event, the EGM may again similarly inform the Player/Patron of the failed or broken communication on the EGM display, and then perhaps revert to the EGM Home Screen or in the like.

In **312**, after the Player/Patron has entered their input SI data into the data slots of the SI display region **114**, and transmitted the data, the input SI data is received by the EGM **2**. As mentioned, input SI data may relate to any passwords, pass codes, address, social security, account numbers, biometric information, etc, and may be in the form of number, letters, symbols, fingerprints, retina scans, etc.

At **314**, the “received” input SI data is Validated or Invalidated, using conventional comparison software and technology. Stored SI data, upon which the input SI data is compared against, will likely be accessed by the EGM, via communication with the system server **4**.

Referring back to FIG. 2C, should the “received” input SI data be determined “Invalid”, at **316**, the EGM will output screen content to the PED **14**, informing the Player/Patron of the invalid input SI data entry (Invalidation Screen **122**). Subsequently, the EGM **2** will output the SI Input Screen **110** back to the PED, at **308**.

In the event that the “received” Input SI is determined valid, at **314**, the EGM will output screen content to the PED **14**, informing the Player/Patron of the valid input SI data entry, at **316** (i.e., Validation Screen **128** of FIG. 2D). Subsequently, the EGM **2** will permit further continuation of the transaction, at **318**. In **322**, the communication with the PED can be ended.

As described above, a remote system server **4** can act as a communication intermediary between an EGM and a mobile device. In addition, the server can be configured to perform operations that allow SI data to be input and entered from a PED **14**. FIG. 3B is a method **400** in a system server **4** involving the entrance of Sensitive Information (SI) data on a Portable Electronic Device (PED), for a transaction on an EGM **2**. In **402**, the server can establish communications with a PED. The server can be located on a casino area network which is internal to the casino. The casino area network can be isolated from external networks such as the Internet.

In **404**, the server **4** can determine whether an EGM is associated with the PED, and establish communications that allows information to be transmitted between the PED and the EGM. For instance, the server can receive a request from the EGM to establish communications with the PED in response to detecting a presence of the PED.

At **406**, a similar Greet Screen **102** or interface (e.g., FIG. 2A) may be formatted and output by the server **4** to the PED

14. For instance, once the initiated transaction has been determined to require the input of SI, the server can format the screen resolution, aspect ratio, font size, etc., depending upon the particular screen display properties of the PED (or format a standard output screen). Upon receiving a continuation signal (e.g., press of the “Start” region 108 of FIG. 2A, the server 4 can output the SI Input Screen 110 of FIG. 2B.

A predetermine response time period will commence, at 408, once each screen is output to the PED for viewing on the PED display 14. The server 4 will determine whether one or more response time periods have been exceeded, and should the Player/Patron fail to input any information or fail to input any key stroke on the PED display after the predetermined time period (e.g., two minutes) has been exceeded, the server will automatically “timeout”, ending the transaction. Similar to the EGM methodology, the system server can inform the Player/Patron of the “timeout” on the PED display and/or the EGM display, and then perhaps revert to the EGM Home Screen or in the like.

In 410, after the Player/Patron has entered their input SI data into the data slots of the SI display region 114, and transmitted the data, the input SI data is received by the server 4. The “received” input SI data is Validated or Invalidated, at 412, by the server using conventional comparison software and technology, and compared the input SI data to the stored SI data stored on the server.

Should the “received” input SI data be determined “Invalid”, at 412, the system server 4 will output screen content to the PED 14, informing the Player/Patron of the invalid input SI data entry (Invalidation Screen 122). Subsequently, the server 4 will output the SI Input Screen 110 back to the PED, at 406.

In the event that the “received” Input SI data is determined valid, at 412, the server will output screen content to the PED 14, informing the Player/Patron of the valid input SI data entry (i.e., Validation Screen 128 of FIG. 2D). Subsequently, the server will permit further continuation of the transaction, at 416.

In 418, the server can determine the PED is no longer to be associated with the EGM. For instance, the server can make this determination based upon a request from the EGM to terminate the communication session between the PED and the EGM or the server can determine that the PED is no longer in the vicinity of the EGM via some mechanism. In 420, the server can terminate communication link between the EGM and the PED. At 422, the server can store a record of the communication that it enabled between the PED and the EGM. Subsequently, the method can return to step 404 while communications are still being maintained with the PED.

Gaming Devices and Systems

Next additional details of EGMs and gaming systems are described with respect to FIGS. 4 and 5. FIG. 4 shows a block diagram of a gaming system 600 in accordance with the described embodiments. The gaming system 600 can include one or more servers, such as server 602, and a variety of gaming devices including but not limited to table gaming devices, such as 652, mobile gaming devices, such as 654, and slot-type gaming devices, such as 656. The table gaming devices, such as 652, can include apparatus associated with table games where a live operator or a virtual operator is employed. The gaming devices and one or more servers can communicate with one another via a network 601. The network can include wired, wireless or a combination of wired and wireless communication connections and associated communication routers.

Some gaming devices, such as 652, 654 and 656, can be configured with a player interface that allows at least 1) selections, such as a wager amount, associated with a wager-based game to be made and 2) an outcome of the wager-based game to be displayed. As an example, gaming devices, 652, 654 and 656, include player interfaces, 652a, 654a and 656a, respectively. Typically, gaming devices with a player interface are located in publically accessible areas, such as a casino floor. On the other hand, some gaming devices, such as server 602, can be located in publically inaccessible areas, such as in a back-room of a casino or even off-site from the casino. Gaming devices located in publically inaccessible areas may not include a player interface. For instance, server 602 does not include a player interface. However, server 602 includes an administrator interface 635 that allows functions associated with the server 602 to be adjusted.

An example configuration of a gaming device is described with respect to gaming device 604. The gaming device 604 can include 1) a game controller 606 for controlling a wager-based game played on the gaming device and 2) a player interface 608 for receiving inputs associated with the wager-based game and for displaying an outcome to the wager-based game. In more detail, the game controller 606 can include a) one or more processors, such as 626, b) memory for holding software executed by the one or more processors, such as 628, c) a power-hit tolerant memory, such as 630, d) one or more trusted memories, such as 632, e) a random number generator and f) a plurality of software applications, 610. The other gaming devices, including table gaming device 652, mobile gaming device 654, slot-type gaming device 656 and server 602, can each include a game controller with all or a portion of the components described with respect to game controller 606.

In particular embodiments, the gaming device can utilize a “state” machine architecture. In a “state” machine architecture critical information in each state is identified and queued for storage to a persistent memory. The architecture doesn’t advance to the next state from a current state until all the critical information that is queued for storage for the current state is stored to the persistent memory. Thus, if an error condition occurs between two states, such as a power failure, the gaming device implementing the state machine can likely be restored to its last state prior to the occurrence of the error condition using the critical information associated with its last state stored in the persistent memory. This feature is often called a “roll back” of the gaming device. Examples of critical information can include but are not limited to an outcome determined for a wager-based game, a wager amount made on the wager-based game, an award amount associated with the outcome, credits available on the gaming device and a deposit of credits to the gaming device.

The power-hit tolerant memory 630 can be used as a persistent memory for critical data, such as critical data associated with maintaining a “state” machine on the gaming device. One characteristic of a power-hit tolerant memory 630 is a fast data transfer time. Thus, in the event of a power-failure, which might be indicated by a sudden power fluctuation, the critical data can be quickly loaded from volatile memory, such as RAM associated with the processor 626, into the power-hit tolerant memory 630 and saved.

In one embodiment, the gaming device 605 can be configured to detect power fluctuations and in response, trigger a transfer of critical data from RAM to the power-hit tolerant memory 630. One example of a power-hit tolerant memory 630 is a battery-backed RAM. The battery supplies power to

the normally volatile RAM so that in the event of a power failure data is not lost. Thus, a battery-backed RAM is also often referred to as a non-volatile RAM or NV-RAM. An advantage of a battery-backed RAM is that the fast data transfer times associated with a volatile RAM can be obtained.

The trusted memory 632 is typically a read-only memory of some type that may be designed to be unalterable. An EPROM or EEPROM are two types of memory that can be used as a trusted memory 632. The gaming device 604 can include one or more trusted memories. Other types of memories, such as Flash memory, can also be utilized as an unalterable memory and the example of an EPROM or EEPROM is provided for purposes of illustration only.

Prior to installation the contents of a trusted memory, such as 632, can be verified. For instance, a unique identifier, such as a hash value, can be generated on the contents of the memory and then compared to an accepted hash value for the contents of the memory. The memory may not be installed if the generated and accepted hash values do not match. After installation, the gaming device can be configured to check the contents of the trusted memory. For instance, a unique identifier, such as a hash value, can be generated on contents of the trusted memory and compared to an expected value for the unique identifier. If the generated value of the unique identifier and the expected value of the unique identifier don't match, then an error condition can be generated on the gaming device 604. In one embodiment, the error condition can result in the gaming device entering a tilt state where game play is temporarily disabled on the gaming device.

Sometimes verification of software executed on the gaming device 604 can be performed by a regulatory body, such as a government agency. Often software used by a game controller, such as 606, can be highly regulated, where only software approved by a regulatory body is allowed to be executed by the game controller 606. In one embodiment, the trusted memory 632 can store authentication programs and/or authentication data for authenticating the contents of various memories on the gaming device 604. For instance, the trusted memory 632 can store an authentication program that can be used to verify the contents of a mass storage device, such as 620, which can include software executed by the game controller 606.

The random number generator (RNG) 634 can be used to generate random numbers that can be used to determine outcomes for a game of chance played on the gaming device. For instance, for a mechanical or video slot reel type of game, the RNG, in conjunction with a payable that lists the possible outcomes for a game of chance and the associated awards for each outcome, can be used to generate random numbers for determining reel positions that display the randomly determined outcomes to the wager-based game. In other example, the RNG might be used to randomly select cards for a card game. Typically, as described above, the outcomes generated on a gaming device, such as 604, are considered critical data. Thus, generated outcomes can be stored to the power-hit tolerant memory 630.

Not all gaming devices may be configured to generate their own game outcomes and thus, may not use an RNG for this purpose. In some embodiments, game outcomes can be generated on a remote device, such as server 602, and then transmitted to the gaming device 604 where the outcome and an associated award can be displayed to the player via the player interface 608. For instance, outcomes to a slot-type game or a card game can be generated on server 602 and transmitted to the gaming device 604.

In other embodiments, the gaming device 604 can be used to play central determination games, such as bingo and lottery games. In a central determination game, a pool of game outcomes can be generated and then, particular game outcomes can be selected as needed (e.g., in response to a player requesting to play the central determination game) from the pool of previously generated outcomes. For instance, a pool of game outcomes for a central determination game can be generated and stored on server 602. Next, in response to a request to play the central determination game on gaming device 604, one of the outcomes from the pool can be downloaded to the gaming device 604. A game presentation including the downloaded outcome can be displayed on the gaming device 604.

In other embodiments, thin client type gaming devices, such as mobile gaming devices used to play wager-based video card or video slot games, may be configured to receive at least game outcomes from a remote device and not use an RNG to generate game outcomes locally. The game outcomes can be generated remotely in response to inputs made on the PED, such as an input indicating a wager amount and/or an input to initiate the game. This information can be sent from the PED to a remote device, such as from mobile gaming device 654 to server 602. After receiving the game outcome from the remote device, a game presentation for the game outcomes generated remotely can be generated and displayed on the PED. In some instances, the game presentation can also be generated remotely and then streamed for display to the PED.

The game controller 606 can be configured to utilize and execute many different types of software applications 610. Typically, the software applications utilized by the game controller 606 can be highly regulated and may undergo a lengthy approval process before a regulatory body allows the software applications to be utilized on a gaming device deployed in the field, such as in a casino. One type of software application the game controller can utilize is an Operating System (OS). The OS can allow various programs to be loaded for execution by the processor 626, such as programs for implementing a state machine on the gaming device 606. Further, the OS can be used to monitor resource utilization on the gaming device 606. For instance, certain applications, such as applications associated with game outcome generation and game presentation that are executed by the OS can be given higher priority to resources, such as the processor 626 and memory 628, than other applications that can be executing simultaneously on the gaming device.

As previously described, the gaming device 604 can execute software for determining the outcome of a wager-based game and generating a presentation of the determined game outcome including displaying an award for the game. As part of the game outcome presentation one or more of 1) electro-mechanical devices, such as reels or wheels, can be actuated, 2) video content can be output to video displays, 3) sounds can be output to audio devices, 4) haptic responses can be actuated on haptic devices or 5) combinations thereof, can be generated under control of the game controller 606. The peripheral devices used to generate components of the game outcome presentation can be associated with the player interface 608 where the types of devices that are utilized for the player interface 608 can vary from device to device.

To play a game, various inputs can be required. For instance, via input devices coupled to the gaming device 604, a wager amount can be specified, a game can be initiated or a selection of a game choice associated with the play of the game can be made. The software 610 executed

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by the game controller **606** can be configured to interpret various signals from the input devices, such as signals received from a touch screen controller or input buttons, and affect the game played on the gaming device in accordance with the received input signals. The input devices can also be part of the player interface **608** provided with the gaming device, such as **604**.

In other embodiments, the gaming software **610** executed by the game controller **606** can include applications that allow a game history including the results of a number of past games to be stored, such as the previous 10 or 100 games played on the gaming device **604**. The game history can be stored to a persistent memory including but not limited to the power-hit tolerant memory **630**. The gaming controller **606** can be configured to provide a menu (typically, only operator accessible), that allows the results of a past game to be displayed via the player interface **608**. The output from the history menu can include a re-creation of the game presentation associated with a past game outcome, such as a video representation of card hand associated with a video poker game, a video representation of a reel configuration associated with a video slot game, and/or raw data associated with the past game result, such as an award amount, an amount wagered, etc. The history menu can be used for dispute resolution purposes, such as if a player complains that they have not been properly awarded for a game previously played on the gaming device **604**.

The reporting software can be used by the game controller **606** to report events that have occurred on the gaming device **604** to remote device, such as server **602**. For instance, in one embodiment, the game controller **606** can be configured to report error conditions that have been detected on the gaming device **604**, such as if a device has malfunctioned or needs attention. For instance, the reporting software can be used to send a message from the gaming device **604** to the server **602** indicating that a printer on the gaming device needs a refill of tickets. In another embodiment, the gaming controller **606** can be configured to report security events that may have occurred on the gaming device **604**, such as but not limited to if a door is opened, a latch is activated or an interior portion of the gaming device **604** has been accessed.

In yet other embodiments, the game controller **606** can be configured to report gaming activity and associated events that has been generated on the gaming device, such as a deposit of cash or an indicia of credit, at the gaming device, a generation of game outcome including an associated award amount and a dispensation of cash or an indicia of credit from the gaming device **604**. As part of a loyalty program, the gaming activity can be associated with a particular player. The reporting software can include player tracking elements that allow the gaming activity of a particular player to be reported to a remote device, such as server **602**.

The game controller **606** can execute the authentication software to verify the authenticity of data and/or software programs executed on the gaming device **604**. For instance, the authentication software can be used to verify the authenticity of data and/or software applications when they are first downloaded to the gaming device **604**. Further, the authentication software can be used to periodically verify the authenticity of data and/or software applications currently residing on the gaming device, such as software applications stored on one of the memories coupled to the gaming device **604** including applications loaded into the memory **628** for execution by the processor **626**.

The communication software executed by the game controller **606** can be used to communicate with a variety of

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devices remote to the gaming device **604**. For instance, the communication software can be used to communicate with one or more of a) servers remote to the device, such as **602**, b) other gaming devices, such as table gaming device **652**, mobile gaming device **654** and slot-type gaming device **656** and c) PEDs carried by casino personnel or players in the vicinity of the gaming device **604**. Via the communication software, the game controller can be configured to communicate via many different communication protocols. For instance, different wireless and/or wired communication protocols can be implemented. Further, proprietary or non-proprietary gaming specific protocols can be implemented. For instance, gaming specific non-proprietary communication protocols, such as G2S (game to system), GDS (gaming device standard) and S2S (system to system) communication protocols provided by the Gaming Standards Association (GSA), Fremont, Calif., can be implemented on the gaming devices described herein.

The gaming device **604** can communicate with one or more remote devices via one or more network interfaces, such as **612**. For instance, via network interfaces **612** and the network **601**, the gaming device **604** can communicate with other gaming devices, such as server **602** and/or gaming devices, **652**, **654** and **656**. The network interfaces can provide wired or wireless communications pathways for the gaming device **604**. Some gaming devices may not include a network interface or can be configured to operate in a stand-alone mode where the network interface is not connected to a network.

In other embodiments, a PED interface or interfaces, such as **614**, can be provided for communicating with a PED, such as a cell phone or a tablet computer carried by players or casino personnel temporarily in the vicinity of the gaming device **604**. A wireless communication protocol, such as Bluetooth™ and a Wi-Fi compatible standard, can be used for communicating with the PEDs via the PED interfaces **614**. In one embodiment, the PED interface can implement a short range communication protocol, such as a near-field communication (NFC) protocol used for mobile wallet applications. NFC is typically used for communication distances of 4 cm or less. In addition, a wired communication interface, such as a docking station, can be integrated into the gaming device, such as **604**. The wired communication interface can be configured to provide communications between the gaming device **604** and the PED and/or providing power to the PED.

Near field communication, or NFC, allows for simplified transactions, data exchange, and connections with a touch. Formed in 2004, the Near Field Communication Forum (NFC Forum) promotes sharing, pairing, and transactions between NFC devices and develops and certifies device compliance with NFC standards. NFC's short range helps keep encrypted identity documents private. Thus, a smartphone or tablet with an NFC chip can make a credit card/debit card payment to a gaming device or serve as keycard or ID card for a loyalty program. Further, an NFC device can act a hotel room key. The user of an NFC device as a hotel room keys and/or a player tracking card instrument may allow fast VIP check-in and reduce staffing requirements.

NFC devices can read NFC tags on a gaming device **604** to get more information about the gaming device including an audio or video presentation. For instance, a tap of an NFC enabled device to a gaming device can be used to instantly share a contact, photo, song, application, video, or website link. In another example, an NFC enabled device can be used to transfer funds to the gaming device or enter the

player in a multi-player tournament. As another example, an NFC enabled device can be used to receive information from a gaming device that can be used in a persistent gaming application or a social media application.

Further, NFC enabled signage can include NFC tags that allow a patron to learn more information about the content advertised in the signage. The NFC enabled signage can be part of a gaming system. For instance, a sign advertising a show available at the casino can be configured to transfer information about the show, show times and ticketing information via an NFC tag. As another example, a sign showing jackpot information, such as progressive jackpot information, can be used to transfer information about the jackpot, such as the last time the jackpot was won and where it was won.

In one embodiment, an NFC interface on a gaming device can be used to set-up a higher speed communication between the gaming device and another NFC enabled device such as smart phone. The higher speed communication rates can be used for expanded content sharing. For instance, a NFC and Bluetooth enabled gaming device can be tapped by an NFC and Bluetooth enabled smart phone for instant Bluetooth pairing between the devices. Instant Bluetooth pairing between a gaming device and an NFC enabled device, such as a smartphone, can save searching, waiting, and entering codes. In another example, a gaming device can be configured as an NFC enabled router, such as a router supporting a Wi-Fi communication standard. Tapping an NFC enabled device to an NFC enabled and Wi-Fi enabled gaming device can be used to establish a Wi-Fi connection between the two devices.

The gaming device **604** can include one or more each of value input devices **616** and value output device **618**. The value input devices **616** can be used to deposit cash or indicia of credit onto the gaming device. The cash or indicia of credit can be used to make wagers on games played on the gaming device **604**. Examples of value input devices **616** include but are not limited to a magnetic-stripped card or smart card reader, a bill and/or ticket acceptor, a network interface for downloading credits from a remote source, a wireless communication interface for reading credit data from nearby devices and a coin acceptor. A few examples of value input devices are shown in FIG. 5.

The value output devices can be used to dispense cash or indicia of credit from the gaming device **604**. Typically, the indicia of credit can be exchanged for cash. For instance, the indicia of credit can be exchanged at a cashier station or at a redemption station. Examples of value output devices can include a network interface for transferring credits into a remote account, a wireless communication interface that can be used with a PED implementing mobile wallet application, a coin hopper for dispensing coins or tokens, a bill dispenser, a card writer, a printer for printing tickets or cards redeemable for cash or credits. Another type of value output device is a merchandise dispenser, which can be configured to dispense merchandise with a tangible value from a gaming device. A few examples of value output devices are shown in FIG. 5.

The combination of value input devices **616** and value output devices **618** can vary from device to device. In some embodiments, a gaming device **604** may not include a value input device or a value output device. For instance, a thin-client gaming device used in a mobile gaming application may not include a value input device and a value output device. Instead, a remote account can be used to maintain the credits won or lost from playing wager-based games via the PED. The PED can be used to access the account and affect

the account balance via game play initiated on the PED. Credits can be deposited or withdrawn from the remote account via some mechanism other than via the PED interface.

In yet other embodiments, the gaming device **604** can include one or more secondary controllers **619**. The secondary controllers can be associated with various peripheral devices coupled to the gaming device, such as the value input devices and value output devices described in the preceding paragraphs. As another example, the secondary controllers can be associated with peripheral devices associated with the player interface **608**, such as input devices, video displays, electro-mechanical displays and a player tracking unit. In some embodiments, the secondary controllers can receive instructions and/or data from and provide responses to the game controller **606**. The secondary controller can be configured to interpret the instructions and/or data from the game controller **606** and control a particular device according to the received instructions and/or data. For instance, a print controller may receive a print command with a number of parameters, such as a credit amount and in response print a ticket redeemable for the credit amount. In another example, a touch screen controller can detect touch inputs and send information to the game controller **606** characterizing the touch input.

In a particular embodiment, a secondary controller can be used to control a number of peripheral devices independently of the game controller **606**. For instance, a player tracking unit can include one or more of a video display, a touch screen, card reader, network interface or input buttons. A player tracking controller can control these devices to provide player tracking services and bonusing on the gaming device **604**. In alternate embodiments, the game controller **604** can control these devices to perform player tracking functions. An advantage of performing player tracking functions via a secondary controller, such as a player tracking controller, is that since the player tracking functions don't involve controlling the wager-based game, the software on the player tracking unit can be developed modified via a less lengthy and regulatory intensive process than is required for software executed by the game controller **606**, which does control the wager-based game. In general, using a secondary controller, certain functions of the gaming device **604** that are not subject to as much regulatory scrutiny as the game play functions can be decoupled from the game controller **606** and implemented on the secondary controller instead. An advantage of this approach, like for the player tracking controller, is that software approval process for the software executed by the secondary controller can be less intensive than the process needed to get software approved for the game controller.

A mass storage unit(s) **620**, such as a device including a hard drive, optical disk drive, flash memory or some other memory storage technology can be used to store applications and data used and/or generated by the gaming device **604**. For instance, a mass storage unit, such as **620**, can be used to store gaming applications executed by the game controller **606** where the gaming device **604** can be configured to receive downloads of game applications from remote devices, such as server **602**. In one embodiment, the game controller **606** can include its own dedicated mass storage unit. In another embodiment, critical data, such as game history data stored in the power-hit tolerant memory **630** can be moved from the power-hit tolerant memory **630** to the mass storage unit **620** at periodic intervals for archival purposes and to free up space in the power-hit tolerant memory **630**.

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The gaming device **604** can include security circuitry **622**, such as security sensors and circuitry for monitoring the sensors. The security circuitry **622** can be configured to operate while the gaming device is receiving direct power and operational to provide game play as well as when the gaming device is uncoupled from direct power, such as during shipping or in the event of a power failure. The gaming device **604** can be equipped with one or more secure enclosures, which can include locks for limiting access to the enclosures. One or more sensors can be located within the secure enclosures or coupled to the locks. The sensors can be configured to generate signals that can be used to determine whether secure enclosures have been accessed, locks have been actuated or the gaming device **604**, such as a PED has been moved to an unauthorized area. The security monitoring circuitry can be configured to generate, store and/or transmit error events when the security events, such as accessing the interior of the gaming device, have occurred. The error events may cause the game controller **606** to place itself in a “safe” mode where no game play is allowed until the error event is cleared.

The server **602** can be configured to provide one or more functions to gaming devices or other servers in a gaming system **600**. The server **602** is shown performing a number of different functions. However, in various embodiments, the functions can be divided among multiple servers where each server can communicate with a different combination of gaming devices. For instance, player interface support **636** and gaming device software **638** can be provided on a first server, progressives can be provided on a second server, loyalty program functions **640** and accounting **648** can be provided on a third server, linked gaming **644** can be provided on a fourth server, cashless functions **646** can be provided on a fifth server and security functions **650** can be provided on a sixth server. In this example, each server can communicate with a different combination of gaming devices because each of the functions provided by the servers may not be provided to every gaming device in the gaming system **600**. For instance, the server **602** can be configured to provide progressive gaming functions to gaming devices **604**, **652** and **656** but not gaming device **654**. Thus, the server **602** may not communicate with the mobile gaming device **654** if progressive functions are not enabled on the mobile gaming device at a particular time.

Typically, each server can include an administrator interface that allows the functions of a server, such as **602**, to be configured and maintained. Each server **602** can include a processor and memory. In some embodiments, the servers, such as **602**, can include a game controller with components, such as but not limited to a power-hit tolerant memory **630**, a trusted memory **632** and an RNG **634** described with respect to gaming device **604**. The servers can include one or more network interfaces on which wired or wireless communication protocols can be implemented. Next, some possible functions provided by the server **602** are described. These functions are described for the purposes of illustration only and are not meant to be limiting.

The player interface support **636** can be used to serve content to gaming devices, such as **604**, **652**, **654** and **656**, remote to the server. The content can include video and audio content that can be output on one of the player interfaces, such as **608**, **652a**, **654a** and **656a**. Further, the content can be configured to utilize unique features of a particular player interface, such as video displays, wheels or reels, if the particular player interface is so equipped.

In one embodiment, via the player interface support, content can be output to all or a portion of a primary video

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display that is used to output wager-based game outcomes on a player interface associated with a gaming device. For instance, a portion of the primary display can be allocated to providing a “service window” on the primary video display where the content in the service window is provided from a server remote to the gaming device. In particular embodiments, the content delivered from the server to a gaming device as part of the player interface support **636** can be affected by inputs made on the gaming device. For instance, the service window can be generated on a touch screen display where inputs received via the service window can be sent back to server **602**. In response, to the received inputs, the server **602** can adjust the content that is displayed on the remote gaming device that generated the inputs.

The “service window” application can be generated by software code that is executed independently of other game controller software in a secure “sandbox.” Via the sandbox, an executable can be given limited access to various resources on an EGM, such as a portion of the CPU resources and memory available on a game controller. The memory can be isolated from the memory used by other processes, such as game processes executed by the game controller.

As described above, a service window application can be allowed to control, send and/or receive data from secondary devices on a gaming device, such as a video display, a touch screen power interfaces or communication interfaces. A service window application allowed to utilize a communication interface, such as a wireless communication interface, can be configured to communicate with a PED via the communication interface. Thus, a service window application can be configured to implement attract features as described above independently of a game controller on an EGM. Further details of utilizing a service window on a gaming device on an EGM are described in U.S. patent application Ser. No. 12/209,608, by Weber et al., filed Sep. 12, 2008, titled “Gaming Machine with Externally Controlled Content Display,” which is incorporated herein by reference in its entirety and for all purposes.

In another embodiment, via the video display, the service window application can be configured to output data in an optical image format, such as a 1-D/2-D bar-code or a QR code. The optically formatted data can be captured by a camera on the PED. For instance, a receipt indicating the acceptance of a virtual ticket voucher or virtual currency on the gaming device can be displayed in the service window in a QR code format and transferred to a user’s PED via an image capture device on their PED. In another embodiment, virtual ticket voucher information can be transferred to a PED as optically formatted image data.

If a player’s identity is known, then the player interface support **636** can be used to provide custom content to a remote gaming device, such as **604**. For instance, a player can provide identification information, such as information indicating their membership in a loyalty program, during their utilization of a gaming device. The custom content can be selected to meet the identified player’s interests. In one embodiment, the player’s identity and interests can be managed via a loyalty program, such as via a loyalty program account associated with loyalty function **640**. The custom content can include notifications, advertising and specific offers that are determined to be likely of interest to a particular player.

The gaming device software function **638** can be used to provide downloads of software for the game controller and/or second controllers associated with peripheral devices on a gaming device. For instance, the gaming device soft-

ware **638** may allow an operator and/or a player to select a new game for play on a gaming device. In response to the game selection, the gaming device software function **638** can be used to download game software that allows a game controller to generate the selected game. In another example, in response to determining that a new counterfeit bill is being accepted by bill acceptors in the gaming system **600**, the gaming device software function **638** can be used to download a new detection algorithm to the bill acceptors that allow the counterfeit bill to be detected.

The progressive gaming function **642** can be used to implement progressive game play on one or more gaming devices. In progressive game play, a portion of wagers associated with the play of a progressive game is allocated to a progressive jackpot. A group of gaming devices can be configured to support play of the progressive game and contribute to the progressive jackpot. In various embodiments, the gaming devices contributing to a progressive jackpot may be a group of gaming devices collocated near one another, such as a bank of gaming machines on a casino floor, a group of gaming devices distributed throughout a single casino, or group of gaming devices distributed throughout multiple casinos (e.g., a wide area progressive). The progressive gaming function **642** can be used to receive the jackpot contributions from each of the gaming devices participating in the progressive game, determine a current jackpot and notify participating gaming devices of the current progressive jackpot amount, which can be displayed on the participating gaming devices if desired.

The loyalty function **640** can be used to implement a loyalty program within a casino enterprise. The loyalty function **640** can be used to receive information regarding activities within a casino enterprise including gaming and non-gaming activities and associate the activities with particular individuals. The particular individuals can be known or may be anonymous. The loyalty function **640** can be used to store a record of the activities associated with the particular individuals as well as preferences of the individuals if known. Based upon the information stored with the loyalty function **640** (e.g., free or discounted services including game play), promotions and custom contents can be served to the particular individuals.

The linked gaming function **644** can be used to provide game play activities involving player participating as a group via multiple gaming devices. An example, a group of player might be competing against one another as part of a slot tournament. In another example, a group of players might be working together in attempt to win a bonus that can be shared among the players.

The cashless function **646** can enable the redemption and the dispensation of cashless instruments on a gaming device. For instance, via the cashless function, printed tickets, serving as a cashless instrument, can be used to transfer credits from one gaming device to another gaming device. Further, the printed tickets can be redeemed for cash. The cashless function can be used to generate identifying information that can be stored to a cashless instrument, such as a printed ticket, that allows the instrument to later be authenticated. After authentication, the cashless instrument can be used for additional game play or redeemed for cash.

The accounting function can receive transactional information from various gaming devices within the gaming system **600**. The transactional information can relate to value deposited on each gaming device and value dispensed from each gaming device. The transactional information, which can be received in real-time, can be used to assess the performance of each gaming device as well as an overall

performance of the gaming system. Further, the transactional information can be used for tax and auditing purposes.

The security function **650** can be used to combat fraud and crime in a casino enterprise. The security function **650** can be configured to receive notification of a security event that has occurred on a gaming device, such as an attempt at illegal access. Further, the security function **650** can receive transactional data that can be used to identify if gaming devices are being utilized in a fraudulent or unauthorized manner. The security function **650** can be configured to receive, store and analyze data from multiple sources including detection apparatus located on a gaming device and detection apparatus, such as cameras, distributed throughout a casino. In response to detecting a security event, the security function **650** can be configured to notify casino personnel of the event. For instance, if a security event is detected at a gaming device, a security department can be notified. Depending on the security event, one or more team members of the security department can be dispatched to the vicinity of the gaming device. Next, a perspective diagram of a slot-type gaming device that can include all or a portion of the components described with respect to gaming device **604** is described.

FIG. 5 shows a perspective drawing of a gaming device **700** in accordance with the described embodiments. The gaming device **700** is example of what can be considered a “thick-client.” Typically, a thick-client is configurable to communicate with one or more remote servers but provides game play, such as game outcome determination, independent of the remote servers. In addition, a thick-client can be considered as such because it includes cash handling capabilities, such as peripheral devices for receiving cash, and a secure enclosure within the device for storing the received cash. In contrast, thin-client device, such as a mobile gaming device, may be more dependent on a remote server to provide a component of the game play on the device, such as game outcome determination, and/or may not include peripheral devices for receiving cash and an associated enclosure for storing it.

Many different configurations are possible between thick and thin clients. For instance, a thick-client device, such as **700**, deployed in a central determination configuration, may receive game outcomes from a remote server but still provide cash handling capabilities. Further, the peripheral devices can vary from gaming device to gaming device. For instance, the gaming device **700** can be configured with electro-mechanical reels to display a game outcome instead of a video display, such as **710**. Thus, the features of gaming device **700** are described for the purposes of illustration only and are not meant to be limiting.

The gaming device **700** can include a main cabinet **702**. The main cabinet **702** can provide a secure enclosure that prevents tampering with the device components, such as a game controller (not shown) located within the interior of the main cabinet and cash handling devices including a coin acceptor **720**, a ticket printer **726** and a bill acceptor **718**. The main cabinet can include an access mechanism, such as door **704**, which allows an interior of the gaming device **700** to be accessed. The actuation of the door **704** can be controlled by a locking mechanism, such as lock **716**. The lock **716**, the door **704** and the interior of the main cabinet **702** can be monitored with security sensors for detecting whether the interior has been accessed. For instance, a light sensor can be provided to detect a change in light-level in response to the door **704** being opened.

The interior of the main cabinet **700** can include additional secure enclosure, which can also be fitted with locking

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mechanisms. For instance, the game controller, such as game controller 606, shown in FIG. 4, can be secured within a separate locked enclosure. The separate locked enclosure for the game controller may allow maintenance functions to be performed on the gaming device, such as emptying a drop box for coins, emptying a cash box or replacing a device, while preventing tampering with the game controller. Further, in the case of device with a coin acceptor, 720, the separate enclosure can protect the electronics of the game controller from potentially damaging coin dust.

A top box 706 can be mounted to the top of the main cabinet 702. A number of peripheral devices can be coupled to the top box 706. In FIG. 5, a display device 708 and a candle device 714 are mounted to the top box 706. The display device 708 can be used to display information associated with game play on the gaming device 700. For instance, the display device 708 can be used to display a bonus game presentation associated with the play of a wager-based game (One or more bonus games are often features of many wager-based games). In another example, the display device 708 can be used to display information associated with a progressive game, such as one or more progressive jackpot amounts. In yet another example, the display device 708 can be used to display an attract feature that is intended to draw a potential player's attention to the gaming device 700 when it is not in use.

The candle device 714 can include a number of lighting elements. The lighting elements can be lit in different patterns to draw attention to the gaming device. For instance, one lighting pattern may indicate that service is needed at the gaming device 700 while another light pattern may indicate that a player has requested a drink. The candle device 714 is typically placed at the top of gaming device 700 to increase its visibility. Other peripheral devices, including custom bonus devices, such as reels or wheels, can be included in a top box 706 and the example in FIG. 5 is provided for illustrative purposes only. For instance, some of the devices coupled to the main cabinet 702, such as printer 726, can be located in a different top box configuration.

The gaming device 700 provides a player interface that allows the play of a game, such as wager-based game. In this embodiment, the player interface includes 1) a primary video display 710 for outputting video images associated with the game play, 2) audio devices, such as 722, for outputting audio content associated with game play and possibly casino operations, 3) an input panel 712 for at least providing game play related inputs and 4) a secondary video display 708 for outputting video content related to the game play (e.g., bonus material) and/or the casino enterprise (e.g., advertising). In particular embodiments, one or both of the video displays, 708 and 710, can be equipped with a touch screen sensor and associated touch screen controller, for detecting touch inputs, such as touch inputs associated with the play of a game or a service window output to the display device.

The input panel 712 can include a number of electro-mechanical input buttons, such as 730, and/or touch sensitive surfaces. For instance, the input panel can include a touch screen equipped video display to provide a touch sensitive surface. In some embodiments, the functions of the electro-mechanical input buttons can be dynamically reconfigurable. For instance, the function of the electro-mechanical input buttons may be changed depending on the game that is being played on the gaming device. To indicate function changes, the input buttons can each include a configurable display, such as an e-ink or a video display for

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indicating the function of button. The output of the configurable display can be adjusted to account for a change in the function of the button.

The gaming device 700 includes a card reader 728, a printer 726, a coin acceptor 720, a bill and/or ticket acceptor 720 and a coin hopper (not shown) for dispensing coins to a coin tray 732. These devices can provide value input/output capabilities on the gaming device 700. For instance, the printer 726 can be used to print out tickets redeemable for cash or additional game play. The tickets generated by printer 726 as well as printers on other gaming devices can be inserted into bill and ticket acceptor 718 to possibly add credits to the gaming device 700. After the ticket is authenticated, credits associated with the ticket can be transferred to the gaming device 700.

The device 718 can also be used to accept cash bills. After the cash bill is authenticated, it can be converted to credits on the gaming device and used for wager-based game play. The coin acceptor 720 can be configured to accept coins that are legal tender or tokens, such as tokens issued by a casino enterprise. A coin hopper (not shown) can be used to dispense coins that are legal tender or tokens into the coin tray 732.

The various aspects, embodiments, implementations or features of the described embodiments can be used separately or in any combination. Various aspects of the described embodiments can be implemented by software, hardware or a combination of hardware and software. The computer readable medium is any data storage device that can store data which can thereafter be read by a computer system. Examples of the computer readable medium include read-only memory, random-access memory, CD-ROMs, DVDs, magnetic tape and optical data storage devices. The computer readable medium can also be distributed over network-coupled computer systems so that the computer readable code is stored and executed in a distributed fashion.

The foregoing description, for purposes of explanation, used specific nomenclature to provide a thorough understanding of the invention. However, it will be apparent to one skilled in the art that the specific details are not required in order to practice the invention. Thus, the foregoing descriptions of specific embodiments of the present invention are presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed. It will be apparent to one of ordinary skill in the art that many modifications and variations are possible in view of the above teachings.

The embodiments were chosen and described in order to best explain the principles of the invention and its practical applications, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the following claims and their equivalents. While the embodiments have been described in terms of several particular embodiments, there are alterations, permutations, and equivalents, which fall within the scope of these general concepts. It should also be noted that there are many alternative ways of implementing the methods and apparatuses of the present embodiments. It is therefore intended that the following appended claims be interpreted as including all such alterations, permutations, and equivalents as fall within the true spirit and scope of the described embodiments.

The invention is claimed as follows:

1. A device comprising:
 - a processor; and

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a memory device which stores a plurality of instructions, which when executed by the processor, cause the processor to:

detect if a mobile device is within a designated range of a designated area of a housing of an electronic gaming machine, wherein said mobile device stores authentication information associated with a player, and

responsive to the mobile device being detected to be within the designated range of the designated area of the housing of the electronic gaming machine:

generate a logon code, and

cause the generated logon code to be wirelessly transmitted to the mobile device, wherein a determination occurs whether to automatically log in the player based on the generated logon code and the stored authentication information.

2. The device of claim 1, wherein the player is automatically logged in responsive to a server determining that a logon code wirelessly transmitted from the mobile device to the server matches the logon code wirelessly transmitted to the mobile device.

3. The device of claim 2, wherein the authentication information is wirelessly transmitted to the server with the logon code.

4. The device of claim 3, wherein the server determines if the authentication information is associated with a player account.

5. The device of claim 1, wherein when executed by the processor after the logon code is wirelessly transmitted to the mobile device, the plurality of instructions cause the processor to wirelessly receive data from the mobile device.

6. The device of claim 5, wherein the data includes a logon code and the stored authentication information.

7. The device of claim 6, wherein when executed by the processor, the plurality of instructions cause the processor to automatically log the player in if the logon code wirelessly transmitted from the mobile device matches the logon code wirelessly transmitted to the mobile device.

8. The device of claim 1, wherein wirelessly transmitting the login code to the mobile device includes emitting near-field radio waves.

9. The device of claim 1, wherein the login code expires after a period of time.

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10. The device of claim 1, wherein the processor is supported by the housing of the electronic gaming machine.

11. A method of operating a device, said method comprising:

detecting if a mobile device is within a designated range of a designated area of a housing of an electronic gaming machine, wherein said mobile device stores authentication information associated with a player, and

responsive to the mobile device being detected to be within the designated range of the designated area of the housing of the electronic gaming machine:

generating, by a processor, a logon code, and

causing the generated logon code to be wirelessly transmitted to the mobile device, wherein a determination occurs whether to automatically log in the player based on the generated logon code and the stored authentication information.

12. The method of claim 11, wherein the player is automatically logged in responsive to a server determining that a logon code wirelessly transmitted from the mobile device to the server matches the logon code wirelessly transmitted to the mobile device.

13. The method of claim 12, wherein the authentication information is wirelessly transmitted to the server with the logon code.

14. The method of claim 13, wherein the server determines if the authentication information is associated with a player account.

15. The method of claim 11, further comprising, after the logon code is wirelessly transmitted to the mobile device, wirelessly receiving data from the mobile device.

16. The method of claim 15, wherein the data includes a logon code and the stored authentication information.

17. The method of claim 16, further comprising automatically logging the player in if the logon code wirelessly transmitted from the mobile device matches the logon code wirelessly transmitted to the mobile device.

18. The method of claim 11, wherein wirelessly transmitting the login code to the mobile device includes emitting near-field radio waves.

19. The method of claim 11, wherein the login code expires after a period of time.

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