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(71) Applicant (for all designated States except US):
IGT [US/US]; 9295 Prototype Drive, Reno, Nevada
89521-8986 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **GRISWOLD, Chauncey, W.** [US/US]; 1160 Monroe Court, Reno, Nevada 89509 (US). **MATTICE, Harold, E.** [US/US]; 1271 Bolivia Way, Gardnerville, Nevada 89410 (US). **WILDER, Richard, L.** [US/US]; 8960 Jedediah Smith Drive, Sparks, Nevada 89436 (US). **GADDA, Christian, E.** [US/US]; 1180 Del Lilly Lane, Las Vegas, Nevada 89123 (US).

(74) Agent: **GRIFFITH, John, F.**; BEYER WEAVER & THOMAS, LLP, P. O. Box 70250, Oakland, California 94612-0250 (US).

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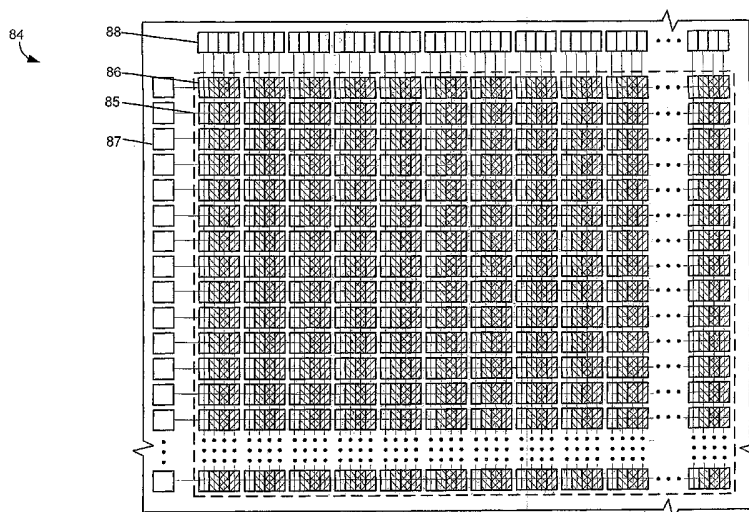
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(54) Title: OPTICALLY SENSITIVE DISPLAY FOR A GAMING APPARATUS



(57) Abstract: A gaming apparatus may include a controller operatively coupled to a display unit and a value input device. The controller may include a processor and a memory operatively coupled to the processor, and may be programmed to cause the display unit to generate a game display. The display unit may include an optically sensitive control panel operatively coupled to the controller, and the controller may be programmed to cause the optically sensitive control panel to read an image and to cause the optically sensitive control panel to generate a display of one or more game controls. An optically sensitive video display screen, and the controller may be programmed to cause the display unit to read an image via the optically sensitive video display screen and to cause the display unit to generate the game display on the optically sensitive video display screen.

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OPTICALLY SENSITIVE DISPLAY FOR A GAMING APPARATUS**Background**

This patent is directed to a casino gaming apparatus, which could be either an individual gaming unit or a casino gaming system having a plurality of gaming units, each gaming unit including an optically sensitive display.

A gaming apparatus of the type used in casinos has included a display unit such as a video display unit or a set of mechanical slot machine reels, a value input device such as a coin slot or paper currency reader, and a controller operatively coupled to the display unit and the value input device and having a processor and a memory operatively coupled to the processor. The controller was programmed to control the overall functions of the gaming machine, including generating game displays representing one or more of a number of casino games, such as poker, blackjack, slots, keno or bingo.

U.S. Patent Application Publication No. 2003/0205662 to Boer discloses an image sensor array. The image sensor array includes image sensors having photo thin-film-transistors (TFTs), which generate a photocurrent in response to received images. U.S. Patent No. 5,951,397 to Dickinson discloses a gaming apparatus that include a touch screen applied to an outer face of a cathode ray tube (CRT) display. The touch screen was used to control play and select games. Touch fields were defined on the surface of the screen. U.S. Patent Application Publication No. 2002/0173354 to Winans et al. discloses a thin light-emitting interface display mounted to a surface on a gaming machine. The thin light-emitting interface displays may be used to input and output gaming information on the gaming machine.

U.S. Patent Application Publication No. 2003/0036425 to Kaminkow, et al. discloses a gaming machine that includes an input mechanism with a non-physical contact data interface, such a bill validator, a bar-code reader and a Radio Frequency Identification (RFID) tag reader. U.S. Patent Application Publication No. 2003/0162591 to Nguyen, et al. discloses a gaming machine that includes a device for acquiring player authentication data from a player tracking card inserted into a card reader, a signature entered via a touchscreen, an image of a personal identification card entered via a scanner, or biometric data such as a fingerprint, an iris, a photographic image, radiometric facial data, or a unique voice characteristic entered via a fingerprint scanner, an iris scanner, a digital camera or a microphone.

Summary of the Invention

In one aspect, the invention is directed to a gaming apparatus which may include a display unit, an optically sensitive control panel, a value input device and a controller operatively coupled to the display unit, the optically sensitive control panel and the value input device. The controller may include a processor and a memory operatively coupled to the processor. The controller may be programmed to cause the optically sensitive control panel generate a display of one or more game controls, to cause the optically sensitive control panel to read an image of a fingerprint of a player when the fingerprint is positioned over the one or more game controls, to compare a characteristic of the fingerprint image with a corresponding characteristic relating to a player identification stored in the memory, to cause the display unit to generate a game display and to determine a value payout associated with an outcome of the game. The display may relate to poker, blackjack, slots, keno or bingo.

In another aspect, the invention is directed to a gaming apparatus which may include a display unit, an optically sensitive control panel, a value input device and a controller operatively coupled to the display unit, the optically sensitive control panel and the value input device. The controller may include a processor and a memory operatively coupled to the processor. The controller may be programmed to cause the optically sensitive control panel to read a first image, to cause the optically sensitive control panel generate a display of one or more game controls, to cause the display unit to generate a game display and to determine a value payout associated with an outcome of the game. The game display may relate to poker, blackjack, slots, keno or bingo.

In yet another aspect, the invention is directed to a gaming apparatus that may include a display unit, a value input device and a controller operatively coupled to the display unit and the value input device. The display unit may include an optically sensitive video display screen. The controller comprising a processor and a memory operatively coupled to the processor. The controller may be programmed to cause the display unit to read an image of an object placed on the optically sensitive display screen, to receive data representing a payline selection made by a player, to cause the display unit to generate a game display on the optically sensitive video display screen and to determine a value payout associated with an outcome of the slots game based on a configuration of slot machine symbols. The game display may include images of

a plurality of slot machine symbols each of which is associated with a respective slot machine reel.

In still another aspect, the invention is directed to a gaming method which may include causing a control display of one or more game controls to be generated on an optically sensitive video display unit, reading an image of a player identification when the identification is positioned over the optically sensitive video display unit comparing a characteristic of the player identification image with a corresponding characteristic relating to a stored player identification causing a game display to be generated, and determining a value payout associated with an outcome of the game represented by the video image. The game display may relate to poker, blackjack, slots, keno or bingo.

Additional aspects of the invention are defined by the claims of this patent.

Brief Description of the Drawings

Fig. 1 is a block diagram of an embodiment of a gaming system in accordance with the invention;

Fig. 2 is a perspective view of an embodiment of one of the gaming units shown schematically in Fig. 1;

Fig. 2A illustrates an embodiment of a control panel for a gaming unit;

Fig. 2B illustrates an embodiment of an optically sensitive video display screen;

Fig. 2C illustrates an embodiment of a pixel element that may be used with the optically sensitive video display screen of Fig. 2B;

Fig. 2D is a cross-sectional illustration of a representation of the pixel element of Fig. 2C;

Fig. 2E illustrates an alternative embodiment of a pixel element that may be used with the optically sensitive video display screen of Fig. 2B;

Fig. 3 is a block diagram of the electronic components of the gaming unit of Fig. 2;

Fig. 4 is a flowchart of an embodiment of a main routine that may be performed during operation of one or more of the gaming units;

Fig. 5 is a flowchart of an alternative embodiment of a main routine that may be performed during operation of one or more of the gaming units;

Fig. 5A is a flowchart of an embodiment of an image display and image input routine that may be performed by one or more of the gaming units;

Fig. 6 is an illustration of an embodiment of a visual display that may be displayed during performance of the video poker routine of Fig. 8;

5 Fig. 7 is an illustration of an embodiment of a visual display that may be displayed during performance of the video blackjack routine of Fig. 9;

Fig. 8 is a flowchart of an embodiment of a video poker routine that may be performed by one or more of the gaming units;

10 Fig. 9 is a flowchart of an embodiment of a video blackjack routine that may be performed by one or more of the gaming units;

Fig. 10 is an illustration of an embodiment of a visual display that may be displayed during performance of the slots routine of Fig. 12;

Fig. 11 is an illustration of an embodiment of a visual display that may be displayed during performance of the video keno routine of Fig. 13;

15 Fig. 12 is a flowchart of an embodiment of a slots routine that may be performed by one or more of the gaming units;

Fig. 13 is a flowchart of an embodiment of a video keno routine that may be performed by one or more of the gaming units;

20 Fig. 14 is an illustration of an embodiment of a visual display that may be displayed during performance of the video bingo routine of Fig. 15; and

Fig. 15 is a flowchart of an embodiment of a video bingo routine that may be performed by one or more of the gaming units.

Detailed Description of Various Embodiments

25 Although the following text sets forth a detailed description of numerous different embodiments of the invention, it should be understood that the legal scope of the invention is defined by the words of the claims set forth at the end of this patent. The detailed description is to be construed as exemplary only and does not describe every possible embodiment of the invention since describing every possible embodiment would be impractical, if not impossible. Numerous alternative
30 embodiments could be implemented, using either current technology or technology developed after the filing date of this patent, which would still fall within the scope of the claims defining the invention.

It should also be understood that, unless a term is expressly defined in this patent using the sentence “As used herein, the term ‘_____’ is hereby defined to mean...” or a similar sentence, there is no intent to limit the meaning of that term, either expressly or by implication, beyond its plain or ordinary meaning, and such term should not be interpreted to be limited in scope based on any statement made in any section of this patent (other than the language of the claims). To the extent that any term recited in the claims at the end of this patent is referred to in this patent in a manner consistent with a single meaning, that is done for sake of clarity only so as to not confuse the reader, and it is not intended that such claim term be limited, by implication or otherwise, to that single meaning. Finally, unless a claim element is defined by reciting the word “means” and a function without the recital of any structure, it is not intended that the scope of any claim element be interpreted based on the application of 35 U.S.C. §112, sixth paragraph.

Fig. 1 illustrates one possible embodiment of a casino gaming system 10 in accordance with the invention. Referring to Fig. 1, the casino gaming system 10 may include a first group or network 12 of casino gaming units 20 operatively coupled to a network computer 22 via a network data link or bus 24. The casino gaming system 10 may include a second group or network 26 of casino gaming units 30 operatively coupled to a network computer 32 via a network data link or bus 34. The first and second gaming networks 12, 26 may be operatively coupled to each other via a network 40, which may comprise, for example, the Internet, a wide area network (WAN), or a local area network (LAN) via a first network link 42 and a second network link 44.

The first network 12 of gaming units 20 may be provided in a first casino, and the second network 26 of gaming units 30 may be provided in a second casino located in a separate geographic location than the first casino. For example, the two casinos may be located in different areas of the same city, or they may be located in different states. The network 40 may include a plurality of network computers or server computers (not shown), each of which may be operatively interconnected. Where the network 40 comprises the Internet, data communication may take place over the communication links 42, 44 via an Internet communication protocol.

The network computer 22 may be a server computer and may be used to accumulate and analyze data relating to the operation of the gaming units 20. For

example, the network computer 22 may continuously receive data from each of the gaming units 20 indicative of the dollar amount and number of wagers being made on each of the gaming units 20, data indicative of how much each of the gaming units 20 is paying out in winnings, data regarding the identity and gaming habits of players
5 playing each of the gaming units 20, etc. The network computer 32 may be a server computer and may be used to perform the same or different functions in relation to the gaming units 30 as the network computer 22 described above.

Although each network 12, 26 is shown to include one network computer 22, 32 and four gaming units 20, 30, it should be understood that different numbers of
10 computers and gaming units may be utilized. For example, the network 12 may include a plurality of network computers 22 and tens or hundreds of gaming units 20, all of which may be interconnected via the data link 24. The data link 24 may be provided as a dedicated hardwired link or a wireless link. Although the data link 24 is shown as a single data link 24, the data link 24 may comprise multiple data links.

Fig. 2 is a perspective view of one possible embodiment of one or more of the gaming units 20. Although the following description addresses the design of the gaming units 20, it should be understood that the gaming units 30 may have the same design as the gaming units 20 described below. It should be understood that the design of one or more of the gaming units 20 may be different than the design of other
20 gaming units 20, and that the design of one or more of the gaming units 30 may be different than the design of other gaming units 30. Each gaming unit 20 may be any type of casino gaming unit and may have various different structures and methods of operation. For exemplary purposes, various designs of the gaming units 20 are described below, but it should be understood that numerous other designs may be
25 utilized.

Referring to Fig. 2, the casino gaming unit 20 may include a housing or cabinet 50 and one or more input devices, which may include a coin slot or acceptor 52, a paper currency acceptor 54, a ticket reader/printer 56 and a card reader 58, which may be used to input value to the gaming unit 20. A value input device may
30 include any device that can accept value from a customer. As used herein, the term "value" may encompass gaming tokens, coins, paper currency, ticket vouchers, credit or debit cards, smart cards, and any other object representative of value.

If provided on the gaming unit 20, the ticket reader/printer 56 may be used to read and/or print or otherwise encode ticket vouchers 60. The ticket vouchers 60 may be composed of paper or another printable or encodable material and may have one or more of the following informational items printed or encoded thereon: the casino name, the type of ticket voucher, a validation number, a bar code with control and/or security data, the date and time of issuance of the ticket voucher, redemption instructions and restrictions, a description of an award, and any other information that may be necessary or desirable. Different types of ticket vouchers 60 could be used, such as bonus ticket vouchers, cash-redemption ticket vouchers, casino chip ticket vouchers, extra game play ticket vouchers, merchandise ticket vouchers, restaurant ticket vouchers, show ticket vouchers, etc. The ticket vouchers 60 could be printed with an optically readable material such as ink, or data on the ticket vouchers 60 could be magnetically encoded. The ticket reader/printer 56 may be provided with the ability to both read and print ticket vouchers 60, or it may be provided with the ability to only read or only print or encode ticket vouchers 60. In the latter case, for example, some of the gaming units 20 may have ticket printers 56 that may be used to print ticket vouchers 60, which could then be used by a player in other gaming units 20 that have ticket readers 56.

If provided, the card reader 58 may include any type of card reading device, such as a magnetic card reader or an optical card reader, and may be used to read data from a card offered by a player, such as a credit card or a player tracking card. If provided for player tracking purposes, the card reader 58 may be used to read data from, and/or write data to, player tracking cards that are capable of storing data representing the identity of a player, the identity of a casino, the player's gaming habits, etc. A player tracking card may be provided as a magnetic card with a magnetic strip containing the data representing the identity of the player, the identity of the casino, the player's gaming habits, etc. The player tracking card may also be provided as an optically readable card with an image provided on the card. The image may represent data regarding the identity of the player, the identity of the casino, the player's gaming habits, etc. The image may include a barcode, a computer generated image, a photograph, a watermark, a symbol, an alphanumeric symbol, etc.

The gaming unit 20 may include one or more audio speakers 62, a coin payout tray 64, an input control panel 66, and a display unit 70. Where the gaming unit 20 is

designed to facilitate play of a video casino game, such as video poker or video slots, the display unit 70 may be a color video display unit that displays images relating to the particular game or games. Where the gaming unit 20 is designed to facilitate play of a reel-type slot machine, the display unit 70 may comprise a plurality of
5 mechanical reels that are rotatable, with each of the reels having a plurality of reel images disposed thereon. The audio speakers 62 may generate audio representing sounds such as the noise of spinning slot machine reels, a dealer's voice, music, announcements or any other audio related to a casino game. The input control panel 66 may be provided as a video display unit that may display a plurality of game
10 controls. The input control panel 66 may be provided with a plurality of pushbuttons, touch-sensitive or optically-sensitive areas that may be pressed by a player to select games, make wagers, make gaming decisions, etc.

Fig. 2A illustrates one possible embodiment of the control panel 66 which may include a plurality of game controls, which may be used where the gaming unit
15 20 is a slot machine having a plurality of mechanical or "virtual" reels. Referring to Fig. 2A, if the display unit 70 is provided in the form of a video display unit, the control panel 66 may include a "See Pays" button 72 that, when activated, causes the display unit 70 to generate one or more display screens showing the odds or payout information for the game or games provided by the gaming unit 20. As used herein,
20 the term "button" is intended to encompass any device that allows a player to make an input, such as an input device that must be depressed to make an input selection or a display area that a player may simply touch. The control panel 66 may include a "Cash Out" button 74 that may be activated when a player decides to terminate play on the gaming unit 20, in which case the gaming unit 20 may return value to the
25 player, such as by returning a number of coins to the player via the payout tray 64. The control panel 66 may further be provided with an "ID" button 75 that may be activated when a player provides a personal identification to the gaming unit 20, in which case the gaming unit 20 may cause the control panel 66 and/or the display unit 70 to read an image such as a player identification (e.g., a fingerprint, a player
30 tracking card, etc.).

If the gaming unit 20 provides a slots game having a plurality of reels and a plurality of paylines which define winning combinations of reel symbols, the control panel 66 may be provided with a plurality of selection buttons 76, each of which

allows the player to select a different number of paylines prior to spinning the reels. For example, five buttons 76 may be provided, each of which may allow a player to select one, three, five, seven or nine paylines.

5 If the gaming unit 20 provides a slots game having a plurality of reels, the control panel 66 may be provided with a plurality of selection buttons 78 each of which allows a player to specify a wager amount for each payline selected. For example, if the smallest wager accepted by the gaming unit 20 is a quarter (\$0.25), the gaming unit 20 may be provided with five selection buttons 78, each of which may allow a player to select one, two, three, four or five quarters to wager for each payline
10 selected. In that case, if a player were to activate the "5" button 76 (meaning that five paylines were to be played on the next spin of the reels) and then activate the "3" button 78 (meaning that three coins per payline were to be wagered), the total wager would be \$3.75 (assuming the minimum bet was \$0.25).

The control panel 66 may include a "Max Bet" button 80 to allow a player to
15 make the maximum wager allowable for a game. In the above example, where up to nine paylines were provided and up to five quarters could be wagered for each payline selected, the maximum wager would be 45 quarters, or \$11.25. The control panel 66 may include a spin button 82 to allow the player to initiate spinning of the reels of a slots game after a wager has been made.

20 In Fig. 2A, a rectangle is shown around the buttons 72, 74, 75, 76, 78, 80, 82. It should be understood that that rectangle simply designates, for ease of reference, an area in which the buttons 72, 74, 76, 78, 80, 82 may be located. Consequently, the term "control panel" should not be construed to imply that a panel or plate separate from the housing 50 of the gaming unit 20 is required, and the term "control panel"
25 may encompass a plurality or grouping of player activatable buttons.

Although one possible control panel 66 is described above, it should be understood that different buttons could be utilized in the control panel 66, and that the particular buttons used may depend on the game or games that could be played on the gaming unit 20. If the display unit 70 is provided as a video display unit, the control
30 panel 66 could be generated by the display unit 70. In that case, each of the buttons of the control panel 66 could be a colored area generated by the display unit 70, and some type of mechanism may be associated with the display unit 70 to detect when

each of the buttons was touched, such as a touch-sensitive screen or an optically sensitive video display screen.

Gaming Unit Display and Control Panel

Fig. 2B is an illustration of an embodiment of an optically sensitive video display screen 84 that may be utilized as part of the control panel 66, if provided as a video display screen. The optically sensitive video display screen 84 may also be utilized as part of the video display unit 70. The optically sensitive video display screen 84 may display video images including game controls, game displays (discussed further below) and other display images. The optically sensitive video display screen 84 may further read images, including a player identification such as a fingerprint, a player identification card (e.g., a player tracking card), etc. The optically sensitive video display screen 84 may concurrently display images and read images.

The optically sensitive video display screen 84 may comprise a plasma display panel (PDP), a liquid crystal display (LCD), a liquid crystal on silicon (LCOS) display, a light emitting diode (LED) display, a ferroelectric LCD display, a field emissions display (FED), an electroluminescent display (ELD), a front projection display, a rear projection display, and a microelectromechanical device (MEM) display such as a digital micromirror device (DMD) display or a grating light valves (GLV) display, etc. The optically sensitive video display screen 84 may further include organic display technologies such as an organic electroluminescent (OEL) display and an organic light emitting diode (OLED) display, as well as a light emitting polymer display. In one example, the optically sensitive video display screen 84 may be a low temperature polysilicon thin film transistor liquid crystal display (LTPS TFT-LCD) or another system on glass (SOG) display technology, such as a display system with a built-in image scanner provided by Toshiba Matsushita Display and demonstrated in April 2003 in Tokyo at the Electronic Display Expo. In addition, the optically sensitive video display screen 84 may be a touch-sensitive display for control of a game routine by a player which may display the game controls for operating the game. Although the optically sensitive video display screen 84 is described as an LCD device, it should be understood that the image reading capabilities of the optically sensitive video display screen 84 may be provided with

other display technologies, such as those mentioned above, using optically sensitive devices, some of which are discussed below.

As shown in Fig. 2B, the optically sensitive video display screen 84 may include an array 85 of a plurality of pixel elements 86. The number of pixel elements 86 within the array 85 may vary depending on the resolution of the optically sensitive video display screen 84. Each pixel element 86 (and the sub-pixel elements thereof) may be operatively coupled to a gate driver 87 and a source driver 88, or any driver mechanism that may receive data relating to an image and cause the pixel element 86 to display a particular color. Together the drivers 87, 88 may cause the array 85 of pixel elements 86 to collectively display an image. The optically sensitive video display screen 84 may further include optical sensors, such as photodiodes or other photosensitive elements. The optical sensors may be provided as part of the array 85 of pixel elements 86 as optical sensor elements. The optical sensors may read an image placed in proximity to the surface of the optically sensitive video display screen 84. Each of the optical sensor elements may be operatively coupled to a control circuit, such as the drivers 87, 88 or a separate image data input device, which may receive image data read by the optical sensor elements.

Fig. 2C is an illustration of an embodiment of a pixel element 86a which may be provided in the array 85. Referring to Fig. 2C, the pixel element 86a may include a plurality of sub-pixel elements including an optical sensor sub-pixel element 90a and a plurality of display sub-pixel elements 91a. As indicated above, the optical sensor sub-pixel element 90a may be a photosensitive or photodetector device such as photodiode optical sensor, a complementary metal oxide semiconductor (CMOS) optical sensor, a charge coupled device (CCD) element sensor (e.g., a light sensitive photocell), a photo TFT, etc. The optical sensor sub-pixel element 90a may be capable of reading images in color or grayscale. The display sub-pixel elements 91a may include a display sub-pixel element for each of the red, green and blue (RGB) display colors used for display devices. An example of a photo TFT, and an image sensor array of photo TFTs, is further described in U.S. Patent Application Pub. No. 2003/0205662, which is hereby expressly incorporated by reference herein.

Fig. 2D is a cross-sectional illustration of a representation of the pixel element 86a shown in Fig. 2C. Referring to Fig. 2D, the pixel element 86a may include a photosensitive device 92. The pixel element 86a may further include a display device

such as a liquid crystal display (LCD) element, which may be a thin film transistor LCD (TFT-LCD). The LCD element may include a transistor 93 and a color filter 95 for each of the display sub-pixel elements 91a. It should be appreciated that additional elements (not shown) may further be provided with the LCD display device such as a storage capacitor, pixel electrodes, interconnect wiring, spacers, etc. In another embodiment, each display sub-pixel element 91a may be individually provided with a color filter 91a, transistor 93, storage capacitor, pixel electrode, interconnect wiring, etc., which may allow each display sub-pixel element 91a to be individually addressable. Likewise, each photosensitive device 92 may be individually addressable. Both the photosensitive device 92 and the LCD element may be provided on a substrate 96, and the color filters 95 may be provided on color filter substrate 97. Polarizers 98, 99 may be provided above and below the LCD element, and a liquid crystal material may be provided between the substrates 96, 97. The polarizers 98, 99 may further be provided above and below the photosensitive device 92. A backlight (not shown) may be provided to emit light beneath the pixel element 86a.

As shown in the array 85 of pixel elements 86 in Fig. 2B, an optical sensor sub-pixel element 90a may be provided for each pixel element 86a in the array 85. In another embodiment, only some of the pixel elements 86 may be provided with an optical sensor sub-pixel element 90a such that particular areas of the optically sensitive video display screen 84 may be used to read images. For example, an image displayed on the optically sensitive video display screen 84, such as the "ID" button 75, may coincide with those pixel elements 86a that include an optical sensor sub-pixel element 90a. In another example, an optical sensor sub-pixel element 90a may only be provided for every other pixel element 86a, every third pixel element 86a, every fourth pixel element 86a, etc., which may be utilized if the resolution of the image of being read may be less than the resolution of an image displayed on the optically sensitive video display screen 84.

Fig. 2E is an alternative embodiment of a pixel element 86b which may be provided in the array 85. Referring to Fig. 2E, the pixel element 86b may include a plurality of sub-pixel elements including a plurality of display sub-pixel elements 91b and a plurality of optical sensor sub-pixel element 90b for each display sub-pixel element 91b. The resolution of an image read by the optically sensitive video display

screen 84 may thereby be three times the resolution of an image displayed on optically sensitive video display screen 84. As above, optical sensor sub-pixel elements 90b may be provided with only some of the pixel elements 86b, such that particular areas of the optically sensitive video display screen 84 may be used to read
5 images, or optical sensor sub-pixel elements 90b may only be provided for every other pixel element 86b, every third pixel element 86b, every fourth pixel element 86b, etc.

Gaming Unit Electronics

Fig. 3 is a block diagram of a number of components that may be incorporated
10 in the gaming unit 20. Referring to Fig. 3, the gaming unit 20 may include a controller 100 that may comprise a program memory 102, a microcontroller or microprocessor (MP) 104, a random-access memory (RAM) 106 and an input/output (I/O) circuit 108, all of which may be interconnected via an address/data bus 110. It should be appreciated that although only one microprocessor 104 is shown, the
15 controller 100 may include multiple microprocessors 104. Similarly, the memory of the controller 100 may include multiple RAMs 106 and multiple program memories 102. Although the I/O circuit 108 is shown as a single block, it should be appreciated that the I/O circuit 108 may include a number of different types of I/O circuits. The RAM(s) 104 and program memories 102 may be implemented as semiconductor
20 memories, magnetically readable memories, and/or optically readable memories, for example.

Although the program memory 102 is shown in Fig. 3 as a read-only memory (ROM) 102, the program memory of the controller 100 may be a read/write or alterable memory, such as a hard disk. In the event a hard disk is used as a program
25 memory, the address/data bus 110 shown schematically in Fig. 3 may comprise multiple address/data buses, which may be of different types, and there may be an I/O circuit disposed between the address/data buses.

Fig. 3 illustrates that the control panel 66, the display unit 70, the coin acceptor 52, the bill acceptor 54, the card reader 58 and the ticket reader/printer 56
30 may be operatively coupled to the I/O circuit 108, each of those components being so coupled by either a unidirectional or bidirectional, single-line or multiple-line data link, which may depend on the design of the component that is used. The speaker(s) 62 may be operatively coupled to a sound circuit 112, that may comprise a voice- and

sound-synthesis circuit or that may comprise a driver circuit. The sound-generating circuit 112 may be coupled to the I/O circuit 108.

As shown in Fig. 3, the components 52, 54, 56, 58, 66, 112 may be connected to the I/O circuit 108 via a respective direct line or conductor. Different connection schemes could be used. For example, one or more of the components shown in Fig. 3 may be connected to the I/O circuit 108 via a common bus or other data link that is shared by a number of components. Furthermore, some of the components may be directly connected to the microprocessor 104 without passing through the I/O circuit 108.

10

Overall Operation of Gaming Unit

One manner in which one or more of the gaming units 20 (and one or more of the gaming units 30) may operate is described below in connection with a number of flowcharts which represent a number of portions or routines of one or more computer programs, which may be stored in one or more of the memories of the controller 100. The computer program(s) or portions thereof may be stored remotely, outside of the gaming unit 20, and may control the operation of the gaming unit 20 from a remote location. Such remote control may be facilitated with the use of a wireless connection, or by an Internet interface that connects the gaming unit 20 with a remote computer (such as one of the network computers 22, 32) having a memory in which the computer program portions are stored. The computer program portions may be written in any high level language such as C, C++, C#, Java or the like or any low-level assembly or machine language. By storing the computer program portions therein, various portions of the memories 102, 106 are physically and/or structurally configured in accordance with computer program instructions.

25

Fig. 4 is a flowchart of a main operating routine 200 that may be stored in the memory of the controller 100. Referring to Fig. 4, the main routine 200 may begin operation at block 202 during which an attraction sequence may be performed in an attempt to induce a potential player in a casino to play the gaming unit 20. The attraction sequence may be performed by displaying one or more video images on the display unit 70 (if provided as a video display unit) and/or causing one or more sound segments, such as voice or music, to be generated via the speakers 62. The attraction sequence may include a scrolling list of games that may be played on the gaming unit 20, a prompt such as the "ID" button 75 to present an identification to the optically

30

sensitive video display screen 84, and/or video images of various games being played, such as video poker, video blackjack, video slots, video keno, video bingo, etc.

During performance of the attraction sequence, if a potential player makes any input to the gaming unit 20 as determined at block 204, the attraction sequence may
5 be terminated and a game-selection display may be generated on the display unit 70 (if provided as a video display unit) at block 206 to allow the player to select a game available on the gaming unit 20. The gaming unit 20 may detect an input at block 204 in various ways. For example, the gaming unit 20 could detect if the player presses any button on the gaming unit 20; the gaming unit 20 could determine if the player
10 deposited one or more coins into the gaming unit 20; the gaming unit 20 could determine if player deposited paper currency into the gaming unit; etc.

The game-selection display generated at block 206 may include, for example, a list of video games that may be played on the gaming unit 20 and/or a visual message to prompt the player to deposit value into the gaming unit 20. While the
15 game-selection display is generated, the gaming unit 20 may wait for the player to make a game selection. Upon selection of one of the games by the player as determined at block 208, the controller 100 may cause one of a number of game routines to be performed to allow the selected game to be played. For example, the game routines could include a video poker routine 210, a video blackjack routine 220,
20 a slots routine 230, a video keno routine 240, and a video bingo routine 250. At block 208, if no game selection is made within a given period of time, the operation may branch back to block 202.

After one of the routines 210, 220, 230, 240, 250 has been performed to allow the player to play one of the games, block 260 may be utilized to determine whether
25 the player wishes to terminate play on the gaming unit 20 or to select another game. If the player wishes to stop playing the gaming unit 20, which wish may be expressed, for example, by selecting a "Cash Out" button, the controller 100 may dispense value to the player at block 262 based on the outcome of the game(s) played by the player. The operation may then return to block 202. If the player did not wish to quit as
30 determined at block 260, the routine may return to block 208 where the game-selection display may again be generated to allow the player to select another game.

It should be noted that although five gaming routines are shown in Fig. 4, a different number of routines could be included to allow play of a different number of

games. The gaming unit 20 may also be programmed to allow play of different games.

Fig. 5 is a flowchart of an alternative main operating routine 300 that may be stored in the memory of the controller 100. The main routine 300 may be utilized for gaming units 20 that are designed to allow play of only a single game or single type of game. Referring to Fig. 5, the main routine 300 may begin operation at block 302 during which an attraction sequence may be performed in an attempt to induce a potential player in a casino to play the gaming unit 20. The attraction sequence may be performed by displaying one or more video images on the display unit 70 (if provided as a video display unit) and/or causing one or more sound segments, such as voice or music, to be generated via the speakers 62.

During performance of the attraction sequence, if a potential player makes any input to the gaming unit 20 as determined at block 304, the attraction sequence may be terminated and a game display may be generated on the display unit 70 (if provided as a video display unit) at block 306. The game display generated at block 306 may include, for example, an image of the casino game that may be played on the gaming unit 20 and/or a visual message to prompt the player to deposit value into the gaming unit 20. At block 308, the gaming unit 20 may determine if the player requested information concerning the game, in which case the requested information may be displayed at block 310. Block 312 may be used to determine if the player requested initiation of a game, in which case a game routine 320 may be performed. The game routine 320 could be any one of the game routines disclosed herein, such as one of the five game routines 210, 220, 230, 240, 250, or another game routine.

After the routine 320 has been performed to allow the player to play the game, block 322 may be utilized to determine whether the player wishes to terminate play on the gaming unit 20. If the player wishes to stop playing the gaming unit 20, which wish may be expressed, for example, by selecting a "Cash Out" button, the controller 100 may dispense value to the player at block 324 based on the outcome of the game(s) played by the player. The operation may then return to block 302. If the player did not wish to quit as determined at block 322, the operation may return to block 308.

Image Display and Image Input

As mentioned above, the optically sensitive video display screen 84 may display images in addition to reading images, which may be performed concurrently. The control panel 66 and/or the video display unit 70 may therefore be capable of displaying and reading images. Fig. 5A is a flowchart of an image display and image input routine 325 that may be stored in the memory of the controller 100. Although the routine 325 may be used to read an image relating to a player identification, such as a handprint, a fingerprint or an image on a player tracking card, it should be understood that aspects of the routine 325 may be used to read other images while displaying images on the optically sensitive video display screen 84, including the image displays described below. In one example, the routine 325 may be used to continually read a player's fingerprint whenever the player makes an input to the gaming unit 20, such as by pressing one of the buttons on the control panel 66.

Referring to Fig. 5A, the image display and image input routine 325 may begin operation at block 326 during the display of an image on the control panel 66 or the video display unit 70. The routine 325 may continually determine whether an image is to be read by the optically sensitive video display screen 84, or the routine 325 may receive a command to read an image, such as by the player pressing the "ID" button 75 or detecting an input from the player. If an image is to be read as determined at block 326, the routine 325 may cause the optically sensitive video display screen 84 to read an image placed in proximity to the surface of the optically sensitive video display screen 84 at block 327.

If provided to authenticate a player's identity, age, etc., the routine 325 may read a particular characteristic(s) of a player identification image and compare the characteristic of the player identification image with a corresponding characteristic(s) stored in a memory of the controller 100. The characteristics may include points or lines on a fingerprint, points or lines on a handprint, the size and spacing of bars on a barcode image, facial characteristics of a player's photograph, watermarks, unique points within a computer generated image or symbol, etc. The characteristics may also be alphanumeric, and the routine 325 may include optical character recognition (OCR) to read the alphanumeric characters. Although described as reading a player identification, the image may also relate to other information regarding the player

including casino identification, player gaming habits, etc. which may be read by the gaming unit 20.

If the characteristic of the image matches the corresponding characteristic stored in the memory as determined at block 329, the routine 325 may generate (or
5 continue generating) an image, such as game controls, a game display, etc., on the video display unit 70 and/or the control panel 66 at block 330. If the characteristic of the image does not match the corresponding characteristic stored in the memory, the routine 325 may prevent the player from continuing to play on the gaming unit 20, such as by no longer generating game controls on the control panel 66 or otherwise
10 locking up the gaming unit 20.

Video Poker

Where the gaming unit 20 is designed to facilitate play of a video poker game, the display unit 70 may comprise a video display unit. Fig. 6 is an exemplary display
15 350 that may be shown on the display unit 70 during performance of the video poker routine 210 shown schematically in Fig. 4. Referring to Fig. 6, the display 350 may include video images 352 of a plurality of playing cards representing the player's hand, such as five cards. To allow the player to control the play of the video poker game, a plurality of player-selectable buttons may be displayed. The buttons may
20 include a "Hold" button 354 disposed directly below each of the playing card images 352, a "Cash Out" button 356, a "See Pays" button 358, a "Bet One Credit" button 360, a "Bet Max Credits" button 362, and a "Deal/Draw" button 364. The display 350 may also include an area 366 in which the number of remaining credits or value is displayed. If the display unit 70 is provided with a touch-sensitive screen, the buttons
25 354, 356, 358, 360, 362, 364 may form part of the video display 350. Alternatively, one or more of those buttons may be provided as part of a control panel that is provided separately from the display unit 70.

Fig. 8 is a flowchart of the video poker routine 210 shown schematically in Fig. 4. Referring to Fig. 8, at block 370, the routine may determine whether the
30 player has requested payout information, such as by activating the "See Pays" button 358, in which case at block 372 the routine may cause one or more pay tables to be displayed on the display unit 70. At block 374, the routine may determine whether the player has made a bet, such as by pressing the "Bet One Credit" button 360, in

which case at block 376 bet data corresponding to the bet made by the player may be stored in the memory of the controller 100. At block 378, the routine may determine whether the player has pressed the "Bet Max Credits" button 362, in which case at block 380 bet data corresponding to the maximum allowable bet may be stored in the
5 memory of the controller 100.

At block 382, the routine may determine if the player desires a new hand to be dealt, which may be determined by detecting if the "Deal/Draw" button 364 was activated after a wager was made. In that case, at block 384 a video poker hand may be "dealt" by causing the display unit 70 to generate the playing card images 352.
10 After the hand is dealt, at block 386 the routine may determine if any of the "Hold" buttons 354 have been activated by the player, in which case data regarding which of the playing card images 352 are to be "held" may be stored in the controller 100 at block 388. If the "Deal/Draw" button 364 is activated again as determined at block 390, each of the playing card images 352 that was not "held" may be caused to
15 disappear from the video display 350 and to be replaced by a new, randomly selected, playing card image 352 at block 392.

At block 394, the routine may determine whether the poker hand represented by the playing card images 352 currently displayed is a winner. That determination may be made by comparing data representing the currently displayed poker hand with
20 data representing all possible winning hands, which may be stored in the memory of the controller 100. If there is a winning hand, a payout value corresponding to the winning hand may be determined at block 396. At block 398, the player's cumulative value or number of credits may be updated by subtracting the bet made by the player and adding, if the hand was a winner, the payout value determined at block 396. The
25 cumulative value or number of credits may also be displayed in the display area 366 (Fig. 6).

Although the video poker routine 210 is described above in connection with a single poker hand of five cards, the routine 210 may be modified to allow other versions of poker to be played. For example, seven card poker may be played, or stud
30 poker may be played. Alternatively, multiple poker hands may be simultaneously played. In that case, the game may begin by dealing a single poker hand, and the player may be allowed to hold certain cards. After deciding which cards to hold, the

held cards may be duplicated in a plurality of different poker hands, with the remaining cards for each of those poker hands being randomly determined.

Video Blackjack

Where the gaming unit 20 is designed to facilitate play of a video blackjack game, the display unit 70 may comprise a video display unit. Fig. 7 is an exemplary display 400 that may be shown on the display unit 70 during performance of the video blackjack routine 220 shown schematically in Fig. 4. Referring to Fig. 7, the display 400 may include video images 402 of a pair of playing cards representing a dealer's hand, with one of the cards shown face up and the other card being shown face down, and video images 404 of a pair of playing cards representing a player's hand, with both the cards shown face up. The "dealer" may be the gaming unit 20.

To allow the player to control the play of the video blackjack game, a plurality of player-selectable buttons may be displayed. The buttons may include a "Cash Out" button 406, a "See Pays" button 408, a "Stay" button 410, a "Hit" button 412, a "Bet One Credit" button 414, and a "Bet Max Credits" button 416. The display 400 may also include an area 418 in which the number of remaining credits or value is displayed. If the display unit 70 is provided with a touch-sensitive screen, the buttons 406, 408, 410, 412, 414, 416 may form part of the video display 400. Alternatively, one or more of those buttons may be provided as part of a control panel that is provided separately from the display unit 70.

Fig. 9 is a flowchart of the video blackjack routine 220 shown schematically in Fig. 4. Referring to Fig. 9, the video blackjack routine 220 may begin at block 420 where it may determine whether a bet has been made by the player. That may be determined, for example, by detecting the activation of either the "Bet One Credit" button 414 or the "Bet Max Credits" button 416. At block 422, bet data corresponding to the bet made at block 420 may be stored in the memory of the controller 100. At block 424, a dealer's hand and a player's hand may be "dealt" by making the playing card images 402, 404 appear on the display unit 70.

At block 426, the player may be allowed to be "hit," in which case at block 428 another card will be dealt to the player's hand by making another playing card image 404 appear in the display 400. If the player is hit, block 430 may determine if the player has "bust," or exceeded 21. If the player has not bust, blocks 426 and 428 may be performed again to allow the player to be hit again.

If the player decides not to hit, at block 432 the routine may determine whether the dealer should be hit. Whether the dealer hits may be determined in accordance with predetermined rules, such as the dealer always hit if the dealer's hand totals 15 or less. If the dealer hits, at block 434 the dealer's hand may be dealt
5 another card by making another playing card image 402 appear in the display 400. At block 436 the routine may determine whether the dealer has bust. If the dealer has not bust, blocks 432, 434 may be performed again to allow the dealer to be hit again.

If the dealer does not hit, at block 436 the outcome of the blackjack game and a corresponding payout may be determined based on, for example, whether the player
10 or the dealer has the higher hand that does not exceed 21. If the player has a winning hand, a payout value corresponding to the winning hand may be determined at block 440. At block 442, the player's cumulative value or number of credits may be updated by subtracting the bet made by the player and adding, if the player won, the payout value determined at block 440. The cumulative value or number of credits
15 may also be displayed in the display area 418 (Fig. 7).

Slots

Where the gaming unit 20 is designed to facilitate play of a video slots game, the display unit 70 may comprise a video display unit. Fig. 10 is an exemplary display 450 that may be shown on the display unit 70 during performance of the slots
20 routine 230 shown schematically in Fig. 4. Referring to Fig. 10, the display 450 may include video images 452 of a plurality of slot machine reels, each of the reels having a plurality of reel symbols 454 associated therewith. Although the display 450 shows five reel images 452, each of which may have three reel symbols 454 that are visible at a time, other reel configurations could be utilized.

To allow the player to control the play of the slots game, a plurality of player-selectable buttons may be displayed. The buttons may include a "Cash Out" button 456, a "See Pays" button 458, a plurality of payline-selection buttons 460 each of which allows the player to select a different number of paylines prior to "spinning" the reels, a plurality of bet-selection buttons 462 each of which allows a player to
25 specify a wager amount for each payline selected, a "Spin" button 464, and a "Max Bet" button 466 to allow a player to make the maximum wager allowable.
30

Fig. 12 is a flowchart of the slots routine 230 shown schematically in Fig. 10. Referring to Fig. 12, at block 470, the routine may determine whether the player has

requested payout information, such as by activating the “See Pays” button 458, in which case at block 472 the routine may cause one or more pay tables to be displayed on the display unit 70. At block 474, the routine may determine whether the player has pressed one of the payline-selection buttons 460, in which case at block 476 data
5 corresponding to the number of paylines selected by the player may be stored in the memory of the controller 100. At block 478, the routine may determine whether the player has pressed one of the bet-selection buttons 462, in which case at block 480 data corresponding to the amount bet per payline may be stored in the memory of the controller 100. At block 482, the routine may determine whether the player has
10 pressed the “Max Bet” button 466, in which case at block 484 bet data (which may include both payline data and bet-per-payline data) corresponding to the maximum allowable bet may be stored in the memory of the controller 100.

If the “Spin” button 464 has been activated by the player as determined at block 486, at block 488 the routine may cause the slot machine reel images 452 to
15 begin “spinning” so as to simulate the appearance of a plurality of spinning mechanical slot machine reels. At block 490, the routine may determine the positions at which the slot machine reel images will stop, or the particular symbol images 454 that will be displayed when the reel images 452 stop spinning. At block 492, the routine may stop the reel images 452 from spinning by displaying stationary reel
20 images 452 and images of three symbols 454 for each stopped reel image 452. The virtual reels may be stopped from left to right, from the perspective of the player, or in any other manner or sequence.

The routine may provide for the possibility of a bonus game or round if certain conditions are met, such as the display in the stopped reel images 452 of a particular
25 symbol 454. If there is such a bonus condition as determined at block 494, the routine may proceed to block 496 where a bonus round may be played. The bonus round may be a different game than slots, and many other types of bonus games could be provided. If the player wins the bonus round, or receives additional credits or points in the bonus round, a bonus value may be determined at block 498. A payout value
30 corresponding to outcome of the slots game and/or the bonus round may be determined at block 500. At block 502, the player’s cumulative value or number of credits may be updated by subtracting the bet made by the player and adding, if the

slot game and/or bonus round was a winner, the payout value determined at block 500.

Although the above routine has been described as a virtual slot machine routine in which slot machine reels are represented as images on the display unit 70, actual slot machine reels that are capable of being spun may be utilized instead, in which case the display unit 70 could be provided in the form of a plurality of mechanical reels that are rotatable, each of the reels having a plurality of reel images disposed thereon.

Video Keno

Where the gaming unit 20 is designed to facilitate play of a video keno game, the display unit 70 may comprise a video display unit. Fig. 11 is an exemplary display 520 that may be shown on the display unit 70 during performance of the video keno routine 240 shown schematically in Fig. 4. Referring to Fig. 11, the display 520 may include a video image 522 of a plurality of numbers that were selected by the player prior to the start of a keno game and a video image 524 of a plurality of numbers randomly selected during the keno game. The randomly selected numbers may be displayed in a grid pattern.

To allow the player to control the play of the keno game, a plurality of player-selectable buttons may be displayed. The buttons may include a "Cash Out" button 526, a "See Pays" button 528, a "Bet One Credit" button 530, a "Bet Max Credits" button 532, a "Select Ticket" button 534, a "Select Number" button 536, and a "Play" button 538. The display 520 may also include an area 540 in which the number of remaining credits or value is displayed. If the display unit 70 is provided with a touch-sensitive screen, the buttons may form part of the video display 520. Alternatively, one or more of those buttons may be provided as part of a control panel that is provided separately from the display unit 70.

Fig. 13 is a flowchart of the video keno routine 240 shown schematically in Fig. 4. The keno routine 240 may be utilized in connection with a single gaming unit 20 where a single player is playing a keno game, or the keno routine 240 may be utilized in connection with multiple gaming units 20 where multiple players are playing a single keno game. In the latter case, one or more of the acts described below may be performed either by the controller 100 in each gaming unit or by one of

the network computer 22, 32 to which multiple gaming units 20 are operatively connected.

Referring to Fig. 13, at block 550, the routine may determine whether the player has requested payout information, such as by activating the "See Pays" button 528, in which case at block 552 the routine may cause one or more pay tables to be displayed on the display unit 70. At block 554, the routine may determine whether the player has made a bet, such as by having pressed the "Bet One Credit" button 530 or the "Bet Max Credits" button 532, in which case at block 556 bet data corresponding to the bet made by the player may be stored in the memory of the controller 100. After the player has made a wager, at block 558 the player may select a keno ticket, and at block 560 the ticket may be displayed on the display 520. At block 562, the player may select one or more game numbers, which may be within a range set by the casino. After being selected, the player's game numbers may be stored in the memory of the controller 100 at block 564 and may be included in the image 522 on the display 520 at block 566. After a certain amount of time, the keno game may be closed to additional players (where a number of players are playing a single keno game using multiple gambling units 20).

If play of the keno game is to begin as determined at block 568, at block 570 a game number within a range set by the casino may be randomly selected either by the controller 100 or a central computer operatively connected to the controller, such as one of the network computers 22, 32. At block 572, the randomly selected game number may be displayed on the display unit 70 and the display units 70 of other gaming units 20 (if any) which are involved in the same keno game. At block 574, the controller 100 (or the central computer noted above) may increment a count which keeps track of how many game numbers have been selected at block 570.

At block 576, the controller 100 (or one of the network computers 22, 32) may determine whether a maximum number of game numbers within the range have been randomly selected. If not, another game number may be randomly selected at block 570. If the maximum number of game numbers has been selected, at block 578 the controller 100 (or a central computer) may determine whether there are a sufficient number of matches between the game numbers selected by the player and the game numbers selected at block 570 to cause the player to win. The number of matches

may depend on how many numbers the player selected and the particular keno rules being used.

If there are a sufficient number of matches, a payout may be determined at block 580 to compensate the player for winning the game. The payout may depend on the number of matches between the game numbers selected by the player and the game numbers randomly selected at block 570. At block 582, the player's cumulative value or number of credits may be updated by subtracting the bet made by the player and adding, if the keno game was won, the payout value determined at block 580. The cumulative value or number of credits may also be displayed in the display area 540 (Fig. 11).

Video Bingo

Where the gaming unit 20 is designed to facilitate play of a video bingo game, the display unit 70 may comprise a video display unit. Fig. 14 is an exemplary display 600 that may be shown on the display unit 70 during performance of the video bingo routine 250 shown schematically in Fig. 4. Referring to Fig. 14, the display 600 may include one or more video images 602 of a bingo card and images of the bingo numbers selected during the game. The bingo card images 602 may have a grid pattern.

To allow the player to control the play of the bingo game, a plurality of player-selectable buttons may be displayed. The buttons may include a "Cash Out" button 604, a "See Pays" button 606, a "Bet One Credit" button 608, a "Bet Max Credits" button 610, a "Select Card" button 612, and a "Play" button 614. The display 600 may also include an area 616 in which the number of remaining credits or value is displayed. If the display unit 70 is provided with a touch-sensitive screen, the buttons may form part of the video display 600. Alternatively, one or more of those buttons may be provided as part of a control panel that is provided separately from the display unit 70.

Fig. 15 is a flowchart of the video bingo routine 250 shown schematically in Fig. 4. The bingo routine 250 may be utilized in connection with a single gaming unit 20 where a single player is playing a bingo game, or the bingo routine 250 may be utilized in connection with multiple gaming units 20 where multiple players are playing a single bingo game. In the latter case, one or more of the acts described below may be performed either by the controller 100 in each gaming unit 20 or by one

of the network computers 22, 32 to which multiple gaming units 20 are operatively connected.

Referring to Fig. 15, at block 620, the routine may determine whether the player has requested payout information, such as by activating the “See Pays” button 606, in which case at block 622 the routine may cause one or more pay tables to be displayed on the display unit 70. At block 624, the routine may determine whether the player has made a bet, such as by having pressed the “Bet One Credit” button 608 or the “Bet Max Credits” button 610, in which case at block 626 bet data corresponding to the bet made by the player may be stored in the memory of the controller 100.

After the player has made a wager, at block 628 the player may select a bingo card, which may be generated randomly. The player may select more than one bingo card, and there may be a maximum number of bingo cards that a player may select. After play is to commence as determined at block 632, at block 634 a bingo number may be randomly generated by the controller 100 or a central computer such as one of the network computers 22, 32. At block 636, the bingo number may be displayed on the display unit 70 and the display units 70 of any other gaming units 20 involved in the bingo game.

At block 638, the controller 100 (or a central computer) may determine whether any player has won the bingo game. If no player has won, another bingo number may be randomly selected at block 634. If any player has bingo as determined at block 638, the routine may determine at block 640 whether the player playing that gaming unit 20 was the winner. If so, at block 642 a payout for the player may be determined. The payout may depend on the number of random numbers that were drawn before there was a winner, the total number of winners (if there was more than one player), and the amount of money that was wagered on the game. At block 644, the player’s cumulative value or number of credits may be updated by subtracting the bet made by the player and adding, if the bingo game was won, the payout value determined at block 642. The cumulative value or number of credits may also be displayed in the display area 616 (Fig. 14).

WHAT IS CLAIMED IS:

1. A gaming apparatus, comprising:
 - a display unit;
 - an optically sensitive control panel;
 - 5 a value input device;
 - a controller operatively coupled to said display unit, said optically sensitive control panel and said value input device, said controller comprising a processor and a memory operatively coupled to said processor,
 - said controller being programmed to cause said optically
 - 10 sensitive control panel generate a display of one or more game controls,
 - said controller being programmed to cause said optically sensitive control panel to read an image of a fingerprint of a player when said fingerprint is positioned over said one or more game
 - 15 controls,
 - said controller being programmed to compare a characteristic of said fingerprint image with a corresponding characteristic relating to a player identification stored in said memory,
 - said controller being programmed to cause said display unit to
 - 20 generate a game display relating to one of the following games: poker, blackjack, slots, keno or bingo,
 - said controller being programmed to determine a value payout associated with an outcome of said game.
2. A gaming apparatus as defined in claim 1, wherein said controller is
- 25 programmed to compare said characteristic of said fingerprint image with said corresponding characteristic for each game control activated by said player.
3. A gaming apparatus as defined in claim 1, wherein said controller is programmed to prevent said player from playing said game if said characteristic of said fingerprint image does not match said corresponding characteristic.
- 30 4. A gaming apparatus as defined in claim 1, wherein said optically sensitive control panel comprises an array of pixel elements and at least one optical sensor element for each pixel element in said array.

5. A gaming apparatus as defined in claim 1, wherein said optically sensitive control panel comprises an array of pixel elements, each pixel element comprising a display sub-pixel element and an optical sensor sub-pixel element.

6. A gaming apparatus as defined in claim 1, wherein one or more areas of said optically sensitive control panel relating to said one or more game controls comprise touch-sensitive areas.

7. A gaming apparatus as defined in claim 1, wherein said display unit comprises said optically sensitive control panel.

8. A gaming apparatus, comprising:
a display unit;
an optically sensitive control panel;
a value input device;
a controller operatively coupled to said display unit, said optically sensitive control panel and said value input device, said controller comprising a processor and a memory operatively coupled to said processor,
said controller being programmed to cause said optically sensitive control panel to read a first image,
said controller being programmed to cause said optically sensitive control panel generate a display of one or more game controls,
said controller being programmed to cause said display unit to generate a game display relating to one of the following games: poker, blackjack, slots, keno or bingo,
said controller being programmed to determine a value payout associated with an outcome of said game.

9. A gaming apparatus as defined in claim 8, wherein said display unit comprises a video display unit that is capable of generating video images.

10. A gaming apparatus as defined in claim 9,
wherein said controller is programmed to cause a video image comprising an image of at least five playing cards to be displayed if said game comprises video poker,

wherein said controller is programmed to cause a video image comprising an image of a plurality of simulated slot machine reels to be displayed if said game comprises video slots,

5 wherein said controller is programmed to cause a video image comprising an image of a plurality of playing cards to be displayed if said game comprises video blackjack,

wherein said controller is programmed to cause a video image comprising an image of a plurality of keno numbers to be displayed if said game comprises video keno,

10 wherein said controller is programmed to cause a video image comprising an image of a bingo grid to be displayed if said game comprises video bingo.

11. A gaming apparatus as defined in claim 8, wherein said display unit comprises at least one mechanical slot machine reel.

12. A gaming apparatus as defined in claim 8, wherein said display unit
15 comprises said optically sensitive control panel.

13. A gaming apparatus as defined in claim 8, wherein said optically sensitive control panel comprises an array of pixel elements and at least one optical sensor element for each pixel element in said array.

14. A gaming apparatus as defined in claim 8, wherein said optically
20 sensitive control panel comprises an array of pixel elements, each pixel element comprising a display sub-pixel element and an optical sensor sub-pixel element.

15. A gaming apparatus as defined in claim 8,
wherein said optically sensitive control panel comprises an array of
pixel elements, each pixel element comprising a plurality of display sub-pixel
25 elements,

wherein said optically sensitive control panel comprises an optical sensor element for each display sub-pixel element.

16. A gaming apparatus as defined in claim 8, wherein one or more areas
of said optically sensitive control panel relating to said one or more game controls
30 comprise touch-sensitive areas.

17. A gaming apparatus as defined in claim 8, wherein said controller is programmed to cause said optically sensitive control panel to read an image positioned over said display of one or more game controls.

18. A gaming apparatus as defined in claim 8,
wherein said first image comprises a player identification,
wherein said controller is programmed to cause said optically sensitive
control panel to read said player identification image,
5 wherein said controller is programmed to compare a characteristic of
said player identification image with a corresponding characteristic relating to a
player identification stored in said memory.
19. A gaming apparatus as defined in claim 8,
wherein said first image comprises an image from a player tracking
10 card,
wherein said controller is programmed to cause said optically sensitive
control panel to read said image from said player tracking card.
20. A gaming apparatus as defined in claim 8,
wherein said first image comprises a fingerprint of a player,
15 wherein said controller is programmed to cause said optically sensitive
control panel to read said fingerprint image of said player.
21. A gaming apparatus as defined in claim 20,
wherein said controller is programmed to cause said optically sensitive
control panel to read said fingerprint image when said fingerprint is positioned over
20 said one or more game controls,
wherein said controller is programmed to compare a characteristic of
said fingerprint image with a corresponding characteristic relating to a player
identification stored in said memory for each game control activated by said player.
22. A gaming apparatus as defined in claim 21, wherein said controller is
25 programmed to prevent said player from playing said game if said characteristic of
said fingerprint image does not match said corresponding characteristic.
23. A gaming apparatus as defined in claim 8, wherein said optically
sensitive control panel comprises a liquid crystal display unit.
24. A gaming apparatus as defined in claim 8, wherein said optically
30 sensitive control panel comprises a low temperature polysilicon thin film transistor
liquid crystal display unit.
25. A gaming apparatus as defined in claim 8, wherein said controller is
programmed to cause said display unit to generate a display of said first image.

26. A gaming apparatus as defined in claim 8,
wherein said display unit comprises an optically sensitive video
display screen,

5 wherein said controller is programmed to cause said display unit to
read a second image via said optically sensitive video display screen.

27. A gaming apparatus as defined in claim 26, wherein said optically
sensitive video display screen comprises an array of pixel elements and at least one
optical sensor element for each pixel element in said array.

10 28. A gaming apparatus as defined in claim 26, wherein said optically
sensitive video display screen comprises an array of pixel elements, each pixel
element comprising a display sub-pixel element and an optical sensor sub-pixel
element.

29. A gaming apparatus as defined in claim 26,
wherein said optically sensitive video display screen comprises an
15 array of pixel elements, each pixel element comprising a plurality of display sub-pixel
elements,

wherein said optically sensitive video display screen comprises an
optical sensor element for each display sub-pixel element.

30. A gaming apparatus as defined in claim 26, wherein said optically
20 sensitive video display screen comprises a liquid crystal display unit.

31. A gaming apparatus as defined in claim 26, wherein said optically
sensitive video display screen comprises a low temperature polysilicon thin film
transistor liquid crystal display unit.

32. A gaming apparatus as defined in claim 26, wherein said controller is
25 programmed to cause said display unit to generate a display of said second image on
said optically sensitive video display screen.

33. A gaming apparatus as defined in claim 26, wherein said controller is
programmed to cause said display unit to generate said game display on said optically
sensitive video display screen.

30 34. A gaming system comprising a plurality of gaming apparatuses as
defined in claim 8, said gaming apparatuses being interconnected to form a network
of gaming apparatuses.

35. A gaming system as defined in claim 34, wherein said gaming apparatuses are interconnected via the Internet.

36. A gaming apparatus, comprising:

a display unit comprising an optically sensitive video display screen;

5 a value input device;

a controller operatively coupled to said display unit and said value input device, said controller comprising a processor and a memory operatively coupled to said processor,

10 said controller being programmed to cause said display unit to read an image of an object placed on said optically sensitive display screen,

said controller being programmed to receive data representing a payline selection made by a player,

15 said controller being programmed to cause a game display to be generated by said display unit on said optically sensitive video display screen, said game display comprising images of a plurality of slot machine symbols each of which is associated with a respective slot machine reel,

20 said controller being programmed to determine a value payout associated with an outcome of said slots game, said controller being programmed to determine said outcome of said slots game based on a configuration of said slot machine symbols.

25 37. A gaming apparatus as defined in claim 36, wherein said controller is programmed to cause a video image comprising an image of a plurality of simulated slot machine reels to be displayed by said display unit on said optically sensitive video display screen.

38. A gaming apparatus as defined in claim 36, wherein said display unit further comprises at least one mechanical slot machine reel.

30 39. A gaming apparatus as defined in claim 36, wherein said controller is programmed to receive payline data representing a number of paylines selected by the player.

40. A gaming apparatus as defined in claim 36, wherein said optically sensitive video display screen comprises an array of pixel elements, at least one

optical sensor element for each pixel element in said array and at least one display element for each pixel element in said array.

41. A gaming apparatus as defined in claim 36,
wherein said image comprises a player identification,
5 wherein said controller is programmed to cause said optically sensitive video display screen to read said player identification image,
wherein said controller is programmed to compare a characteristic of said player identification image with a corresponding characteristic relating to a player identification stored in said memory.

10 42. A gaming apparatus as defined in claim 36,
wherein said controller is programmed to cause said optically sensitive video display screen to generate a display of one or more game controls,
wherein said controller is programmed to cause said optically sensitive video display screen to read said fingerprint image when said fingerprint is positioned
15 over said one or more game controls,
wherein said controller is programmed to compare a characteristic of said fingerprint image with a corresponding characteristic relating to said a player identification stored in said memory for each game control activated by said player.

20 43. A gaming system comprising a plurality of gaming apparatuses as defined in claim 36, said gaming apparatuses being interconnected to form a network of gaming apparatuses.

44. A gaming method, comprising:
causing a control display of one or more game controls to be generated on an optically sensitive video display unit;
25 reading an image of a player identification when said identification is positioned over said optically sensitive video display unit;
comparing a characteristic of said player identification image with a corresponding characteristic relating to a stored player identification;
causing a game display of one of the following games to be generated:
30 poker, blackjack, slots, keno or bingo,
determining a value payout associated with an outcome of said game represented by said video image.

45. A gaming method as defined in claim 44, wherein said player identification comprises a fingerprint of said player, wherein reading an image comprises reading an image of said fingerprint when said fingerprint is positioned over said one or more game controls.

5 46. A gaming method as defined in claim 45, additionally comprising comparing said characteristic of said fingerprint image with said corresponding characteristic for each game control activated by said player.

 47. A gaming method as defined in claim 44, additionally comprising preventing said player from playing said game if said characteristic of said player
10 identification image does not match said corresponding characteristic.

 48. A gaming method as defined in claim 44, wherein causing a game display to be generated comprises causing said game display to be generated on said optically sensitive video display unit.

FIG. 1

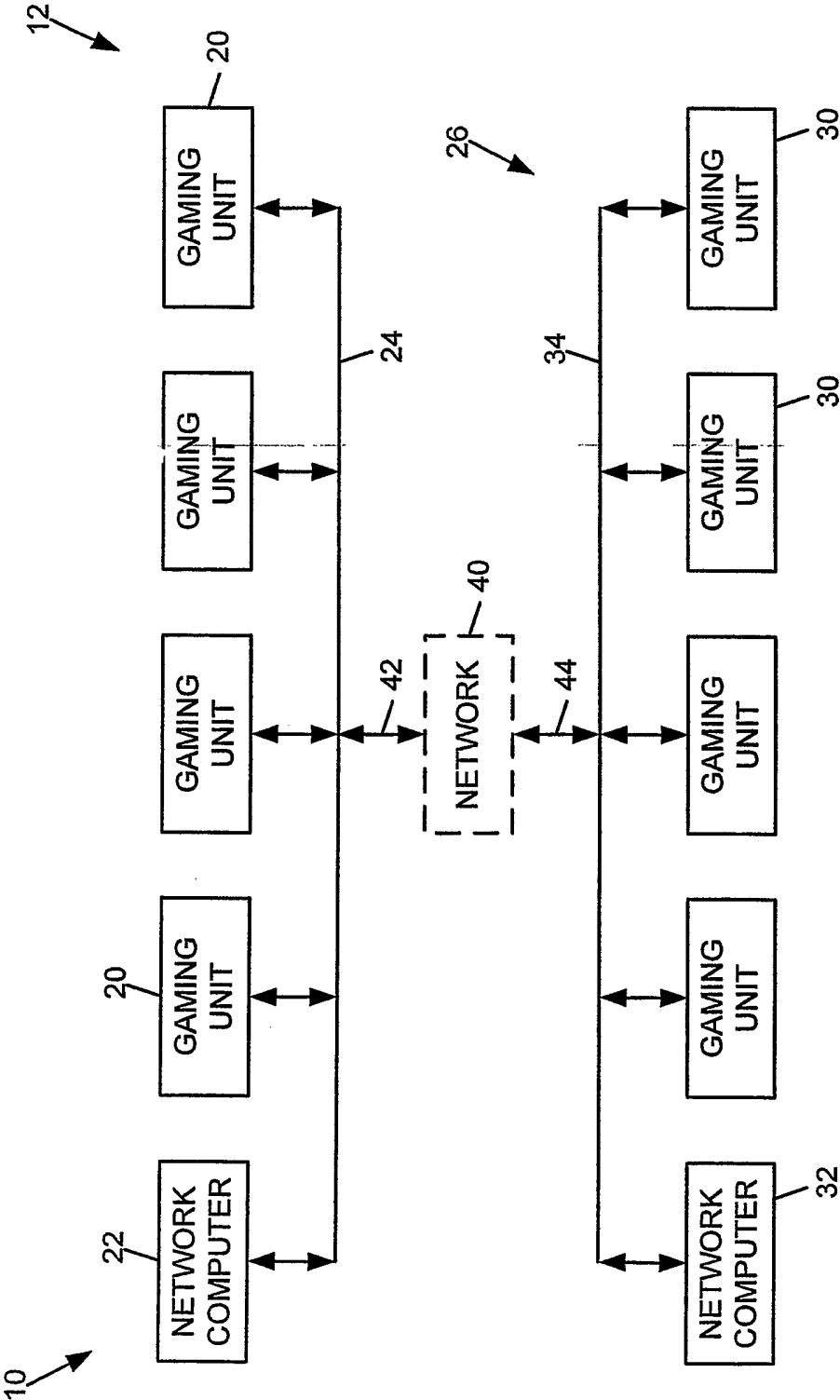


FIG. 2

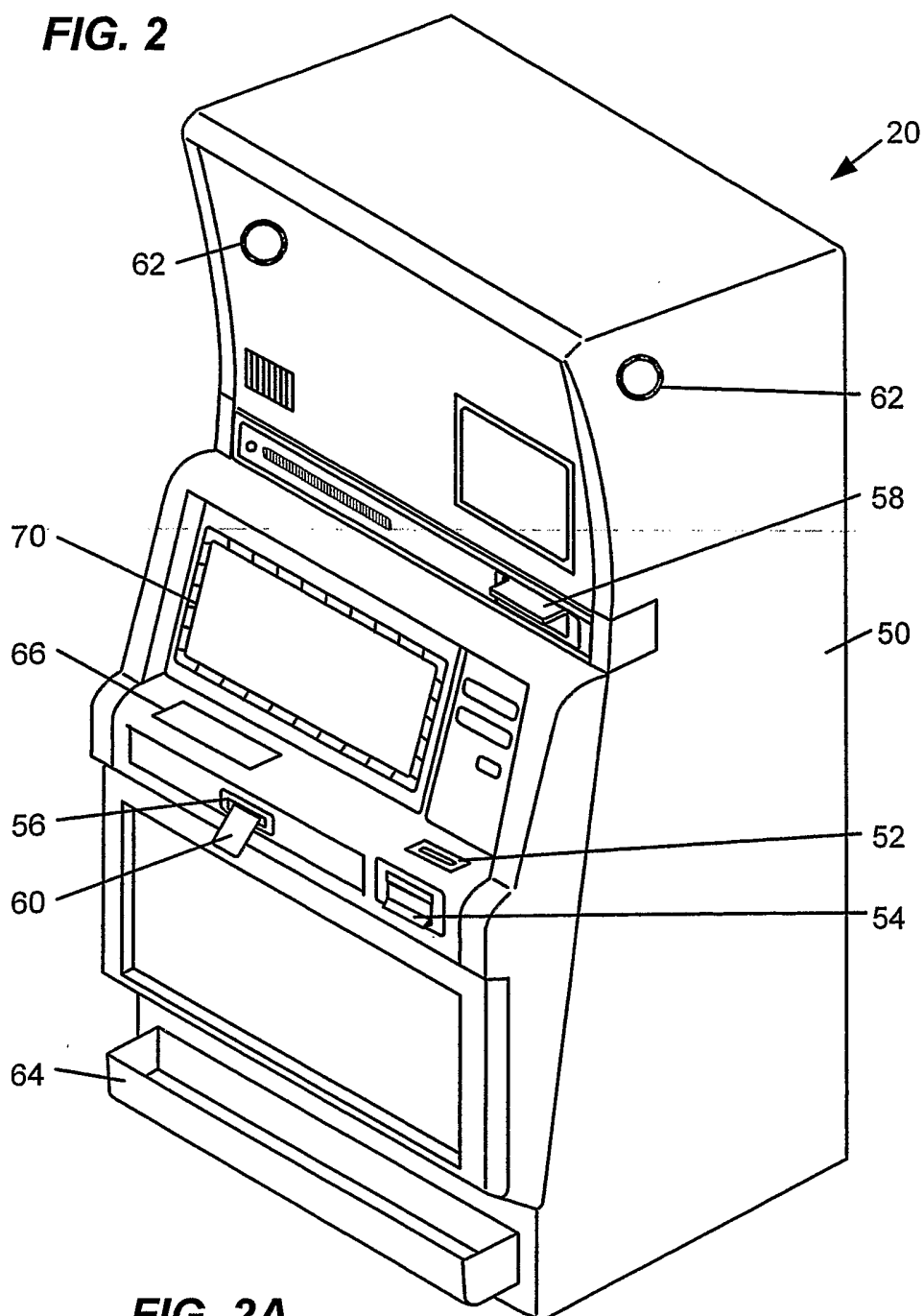
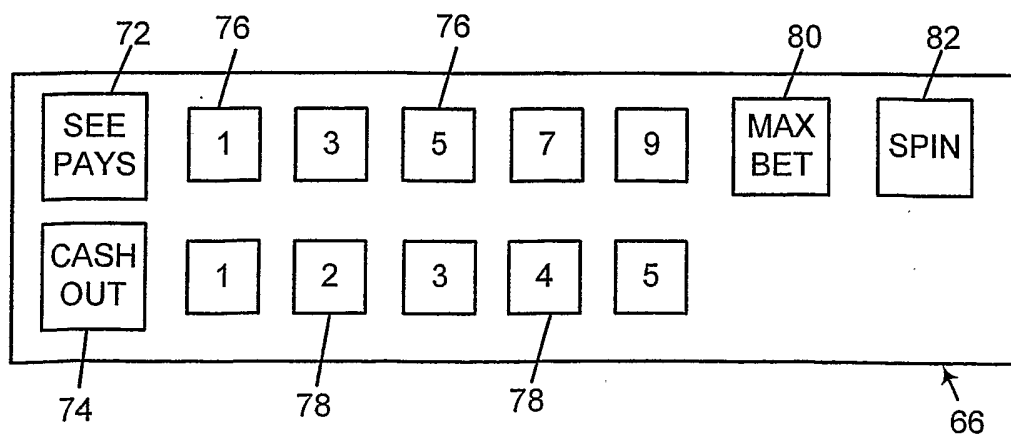
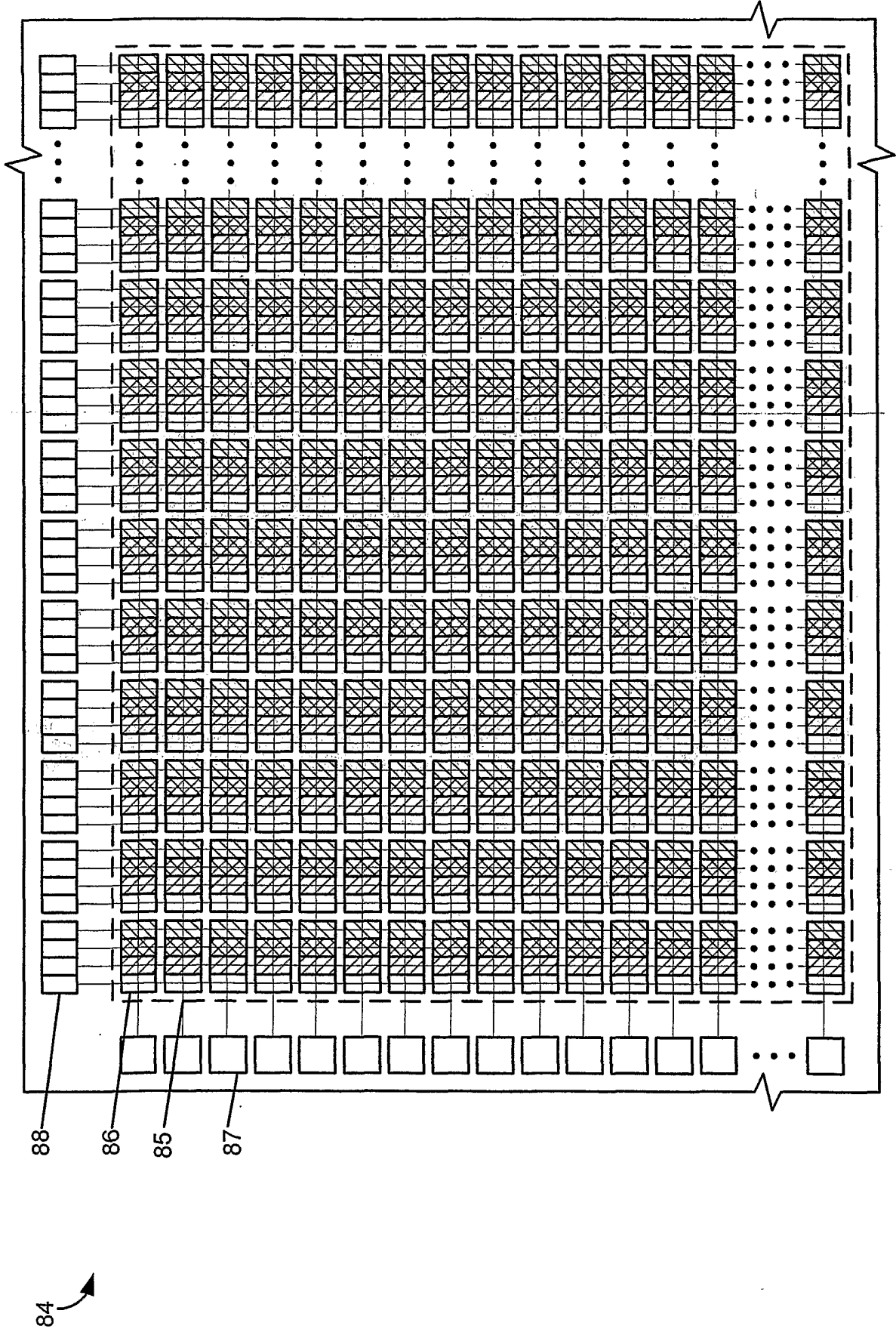
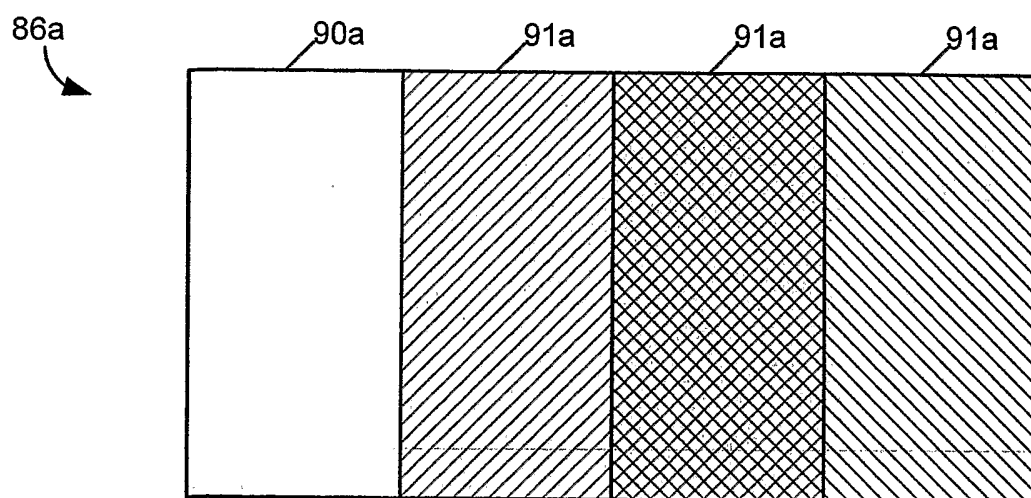
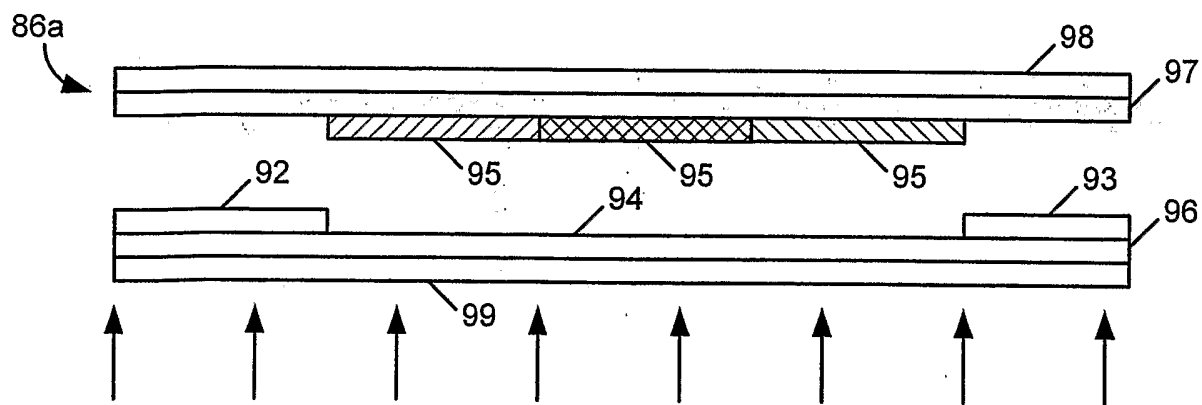


FIG. 2A





**FIG. 2C****FIG. 2D**

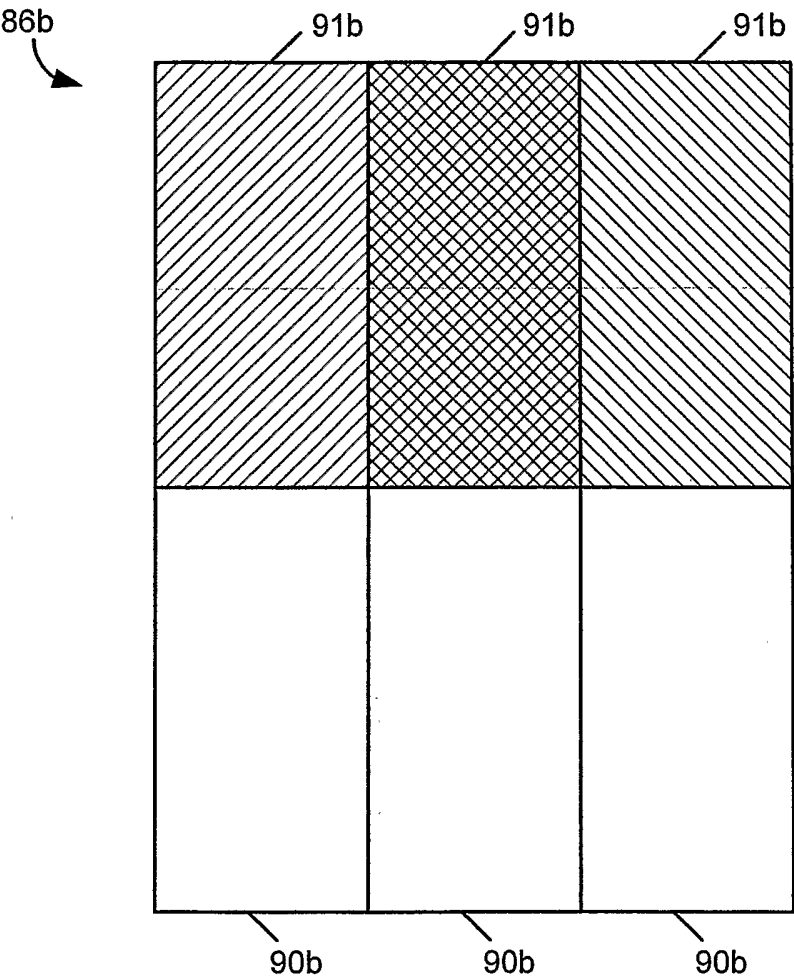


FIG. 2E

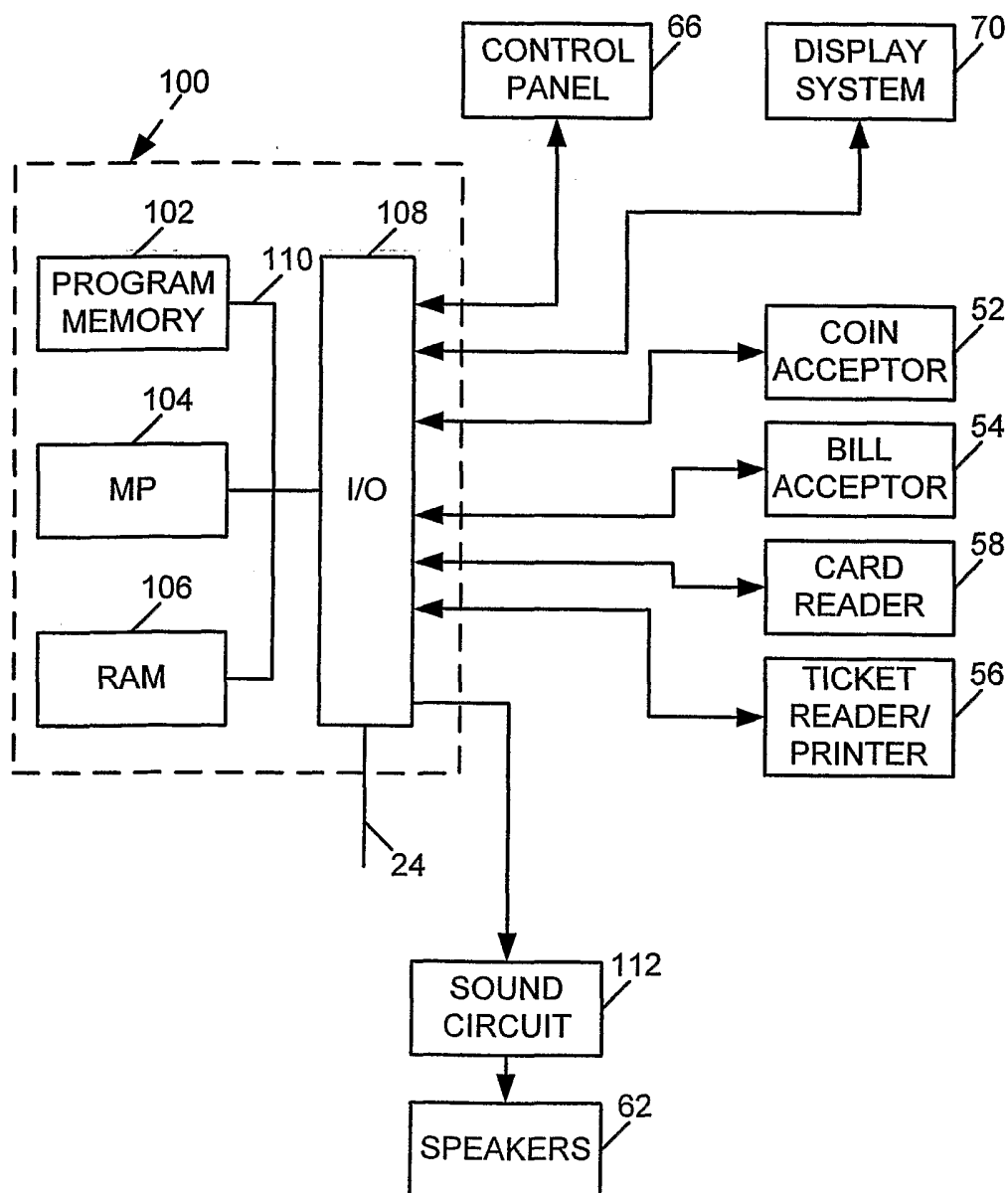
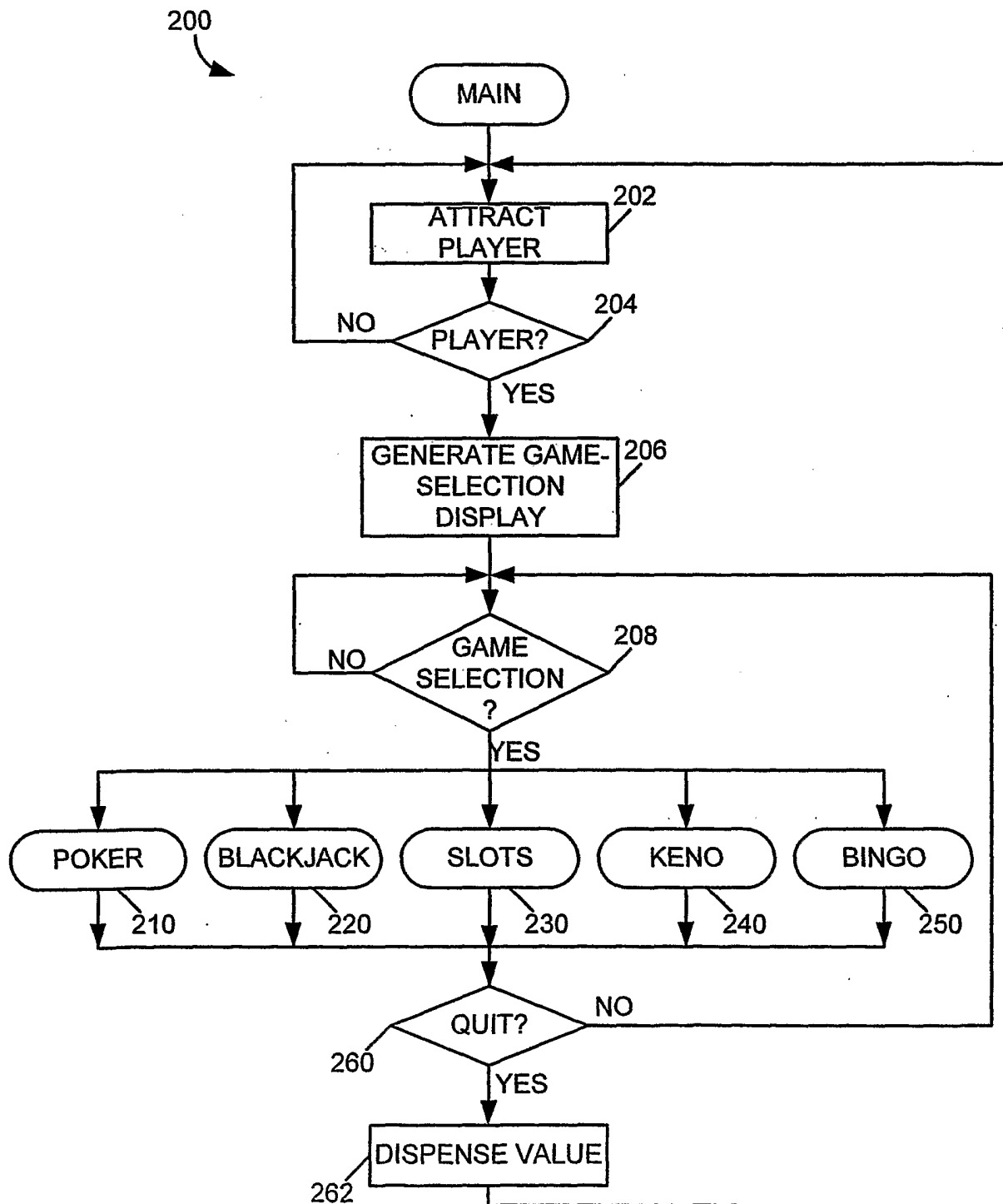
FIG. 320
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FIG. 4

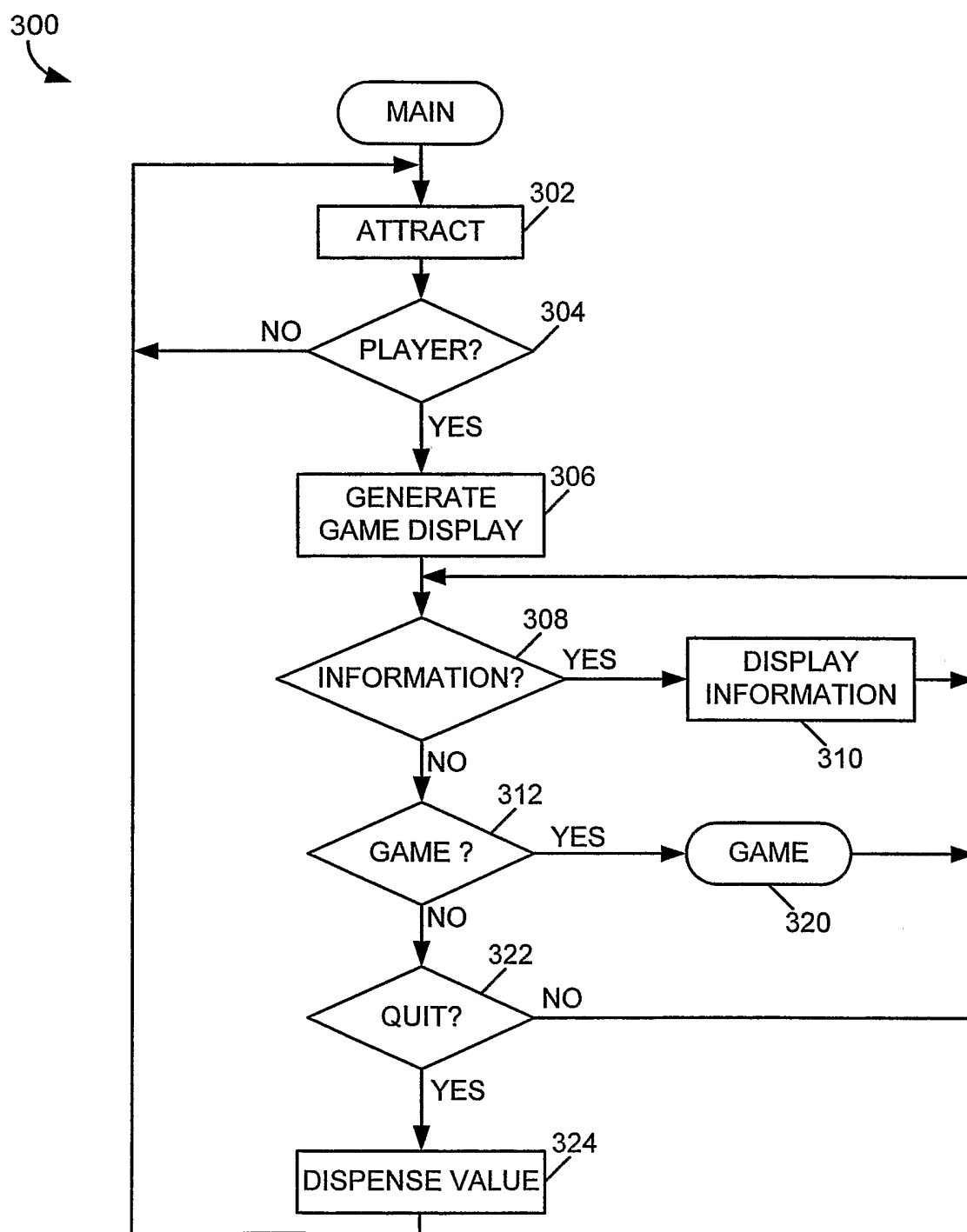
**FIG. 5**

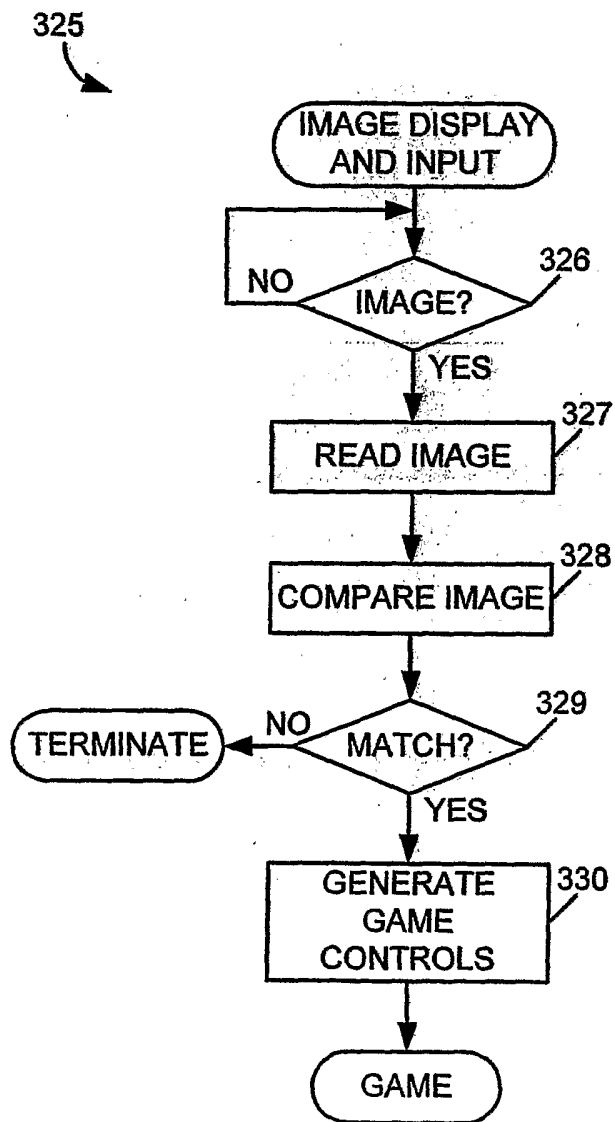
FIG. 5A

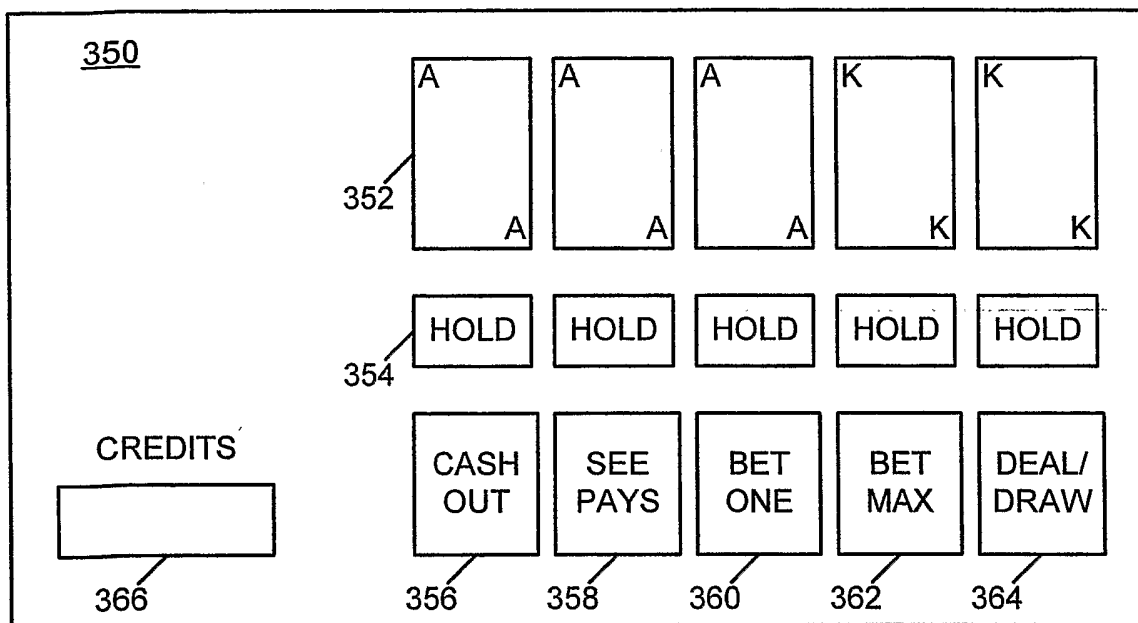
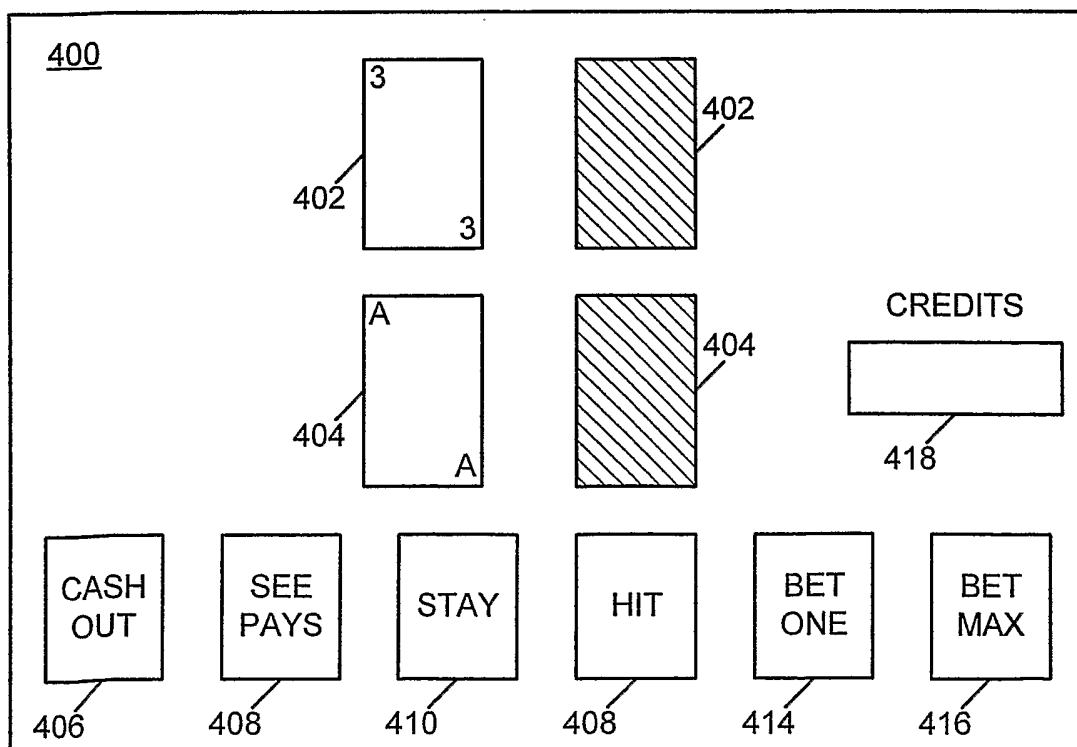
FIG. 6**FIG. 7**

FIG. 8

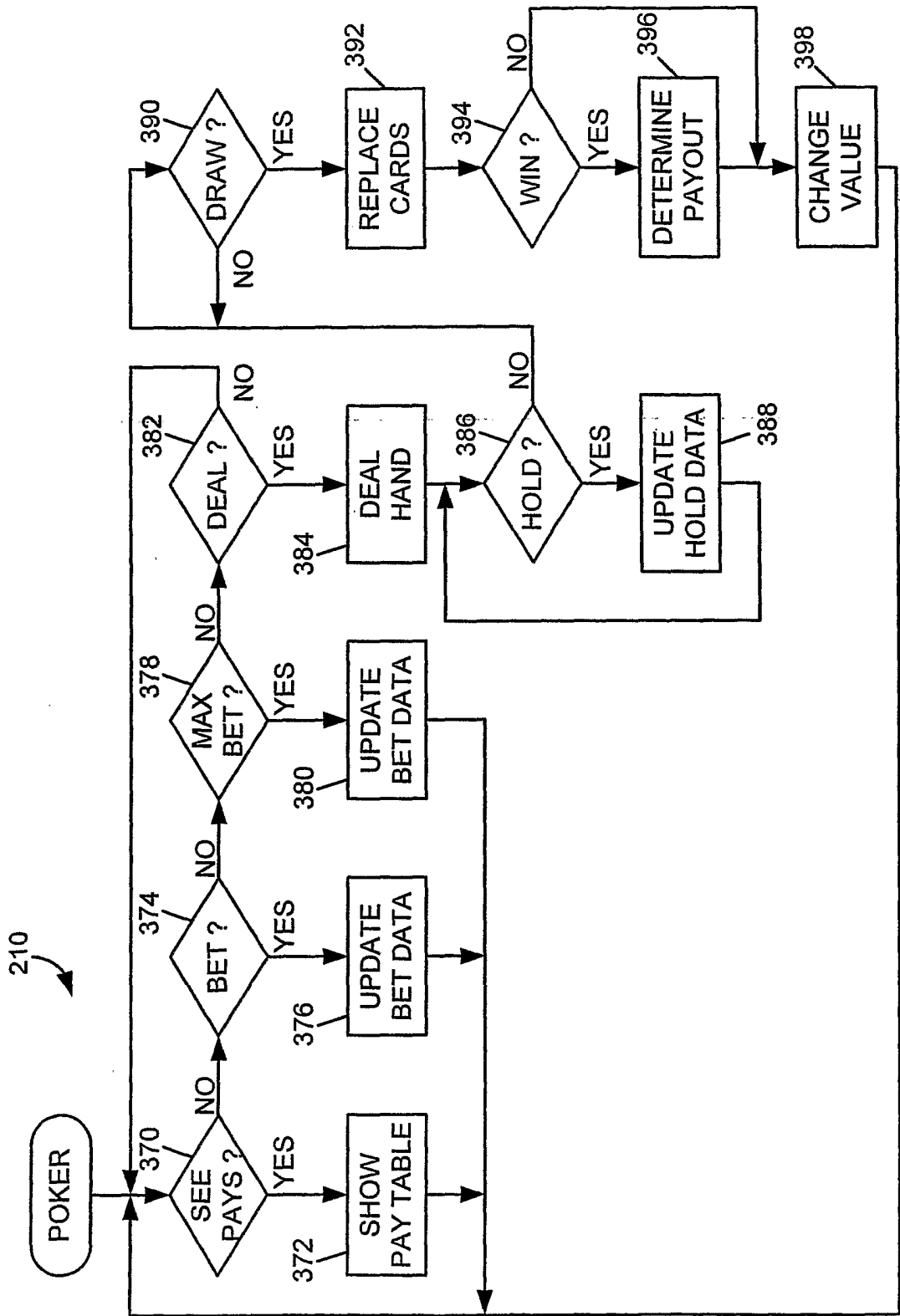


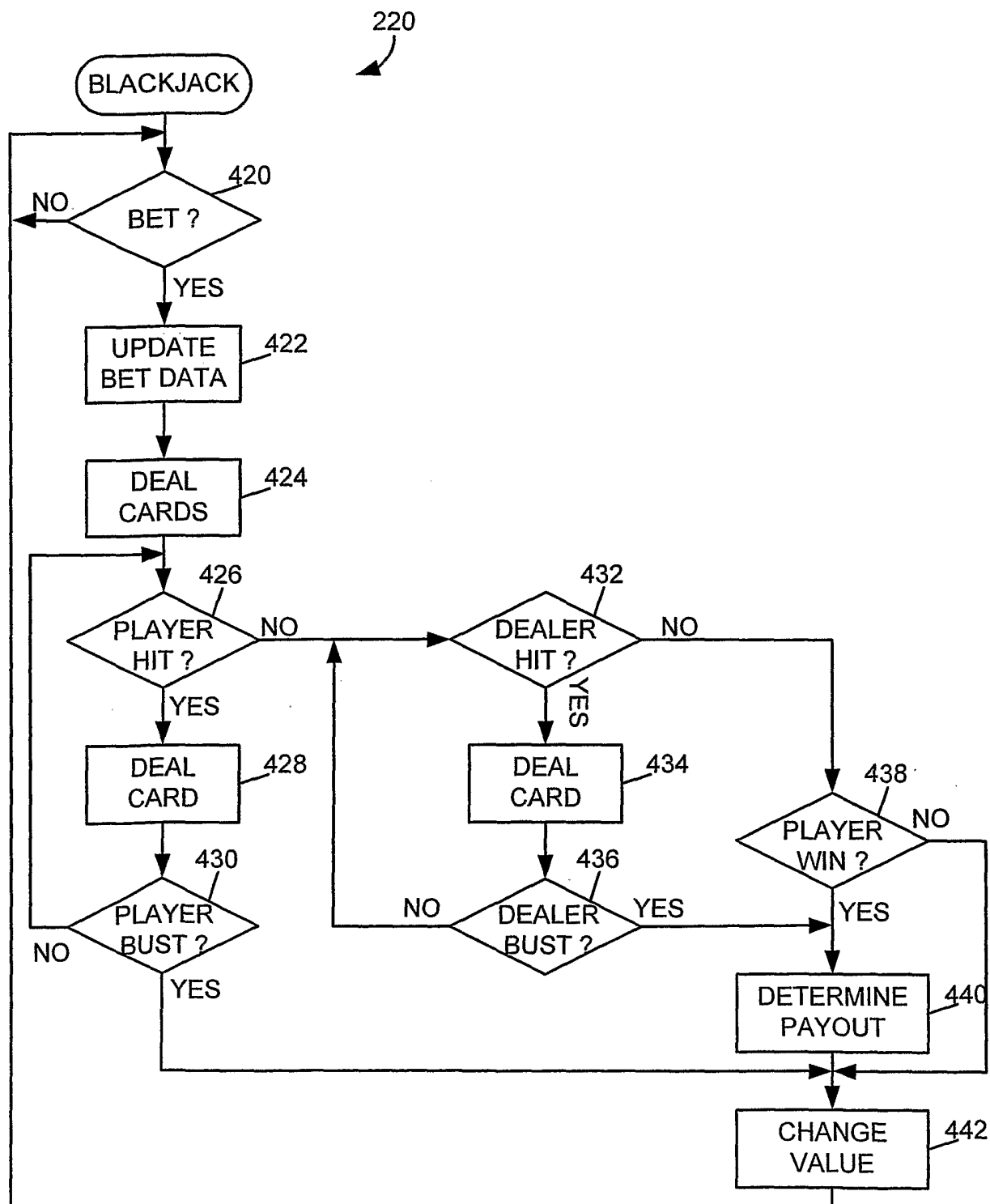
FIG. 9

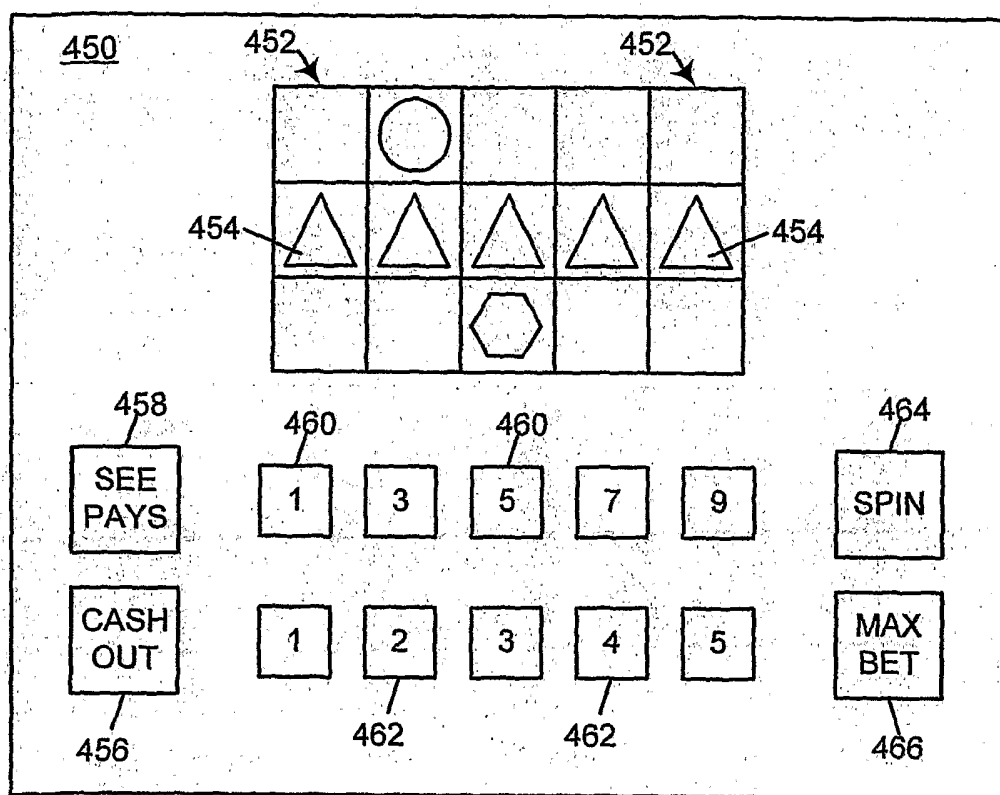
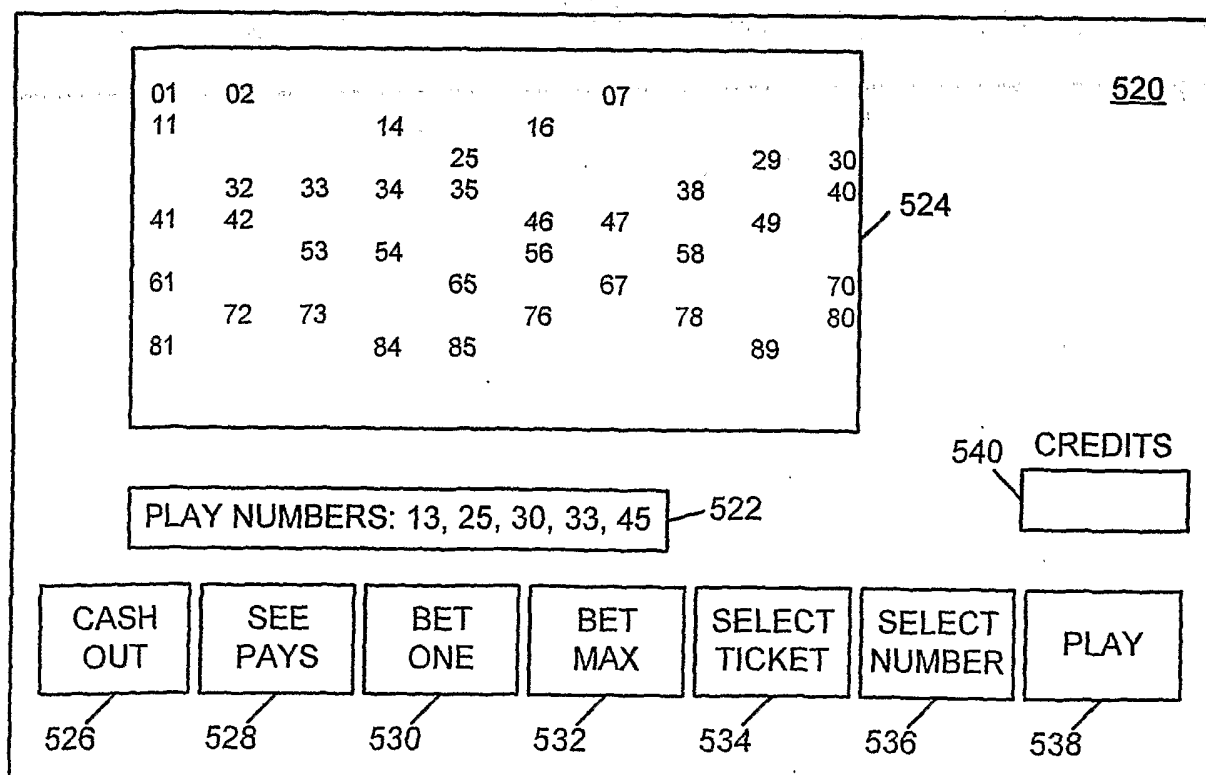
FIG. 10**FIG. 11**

FIG. 12

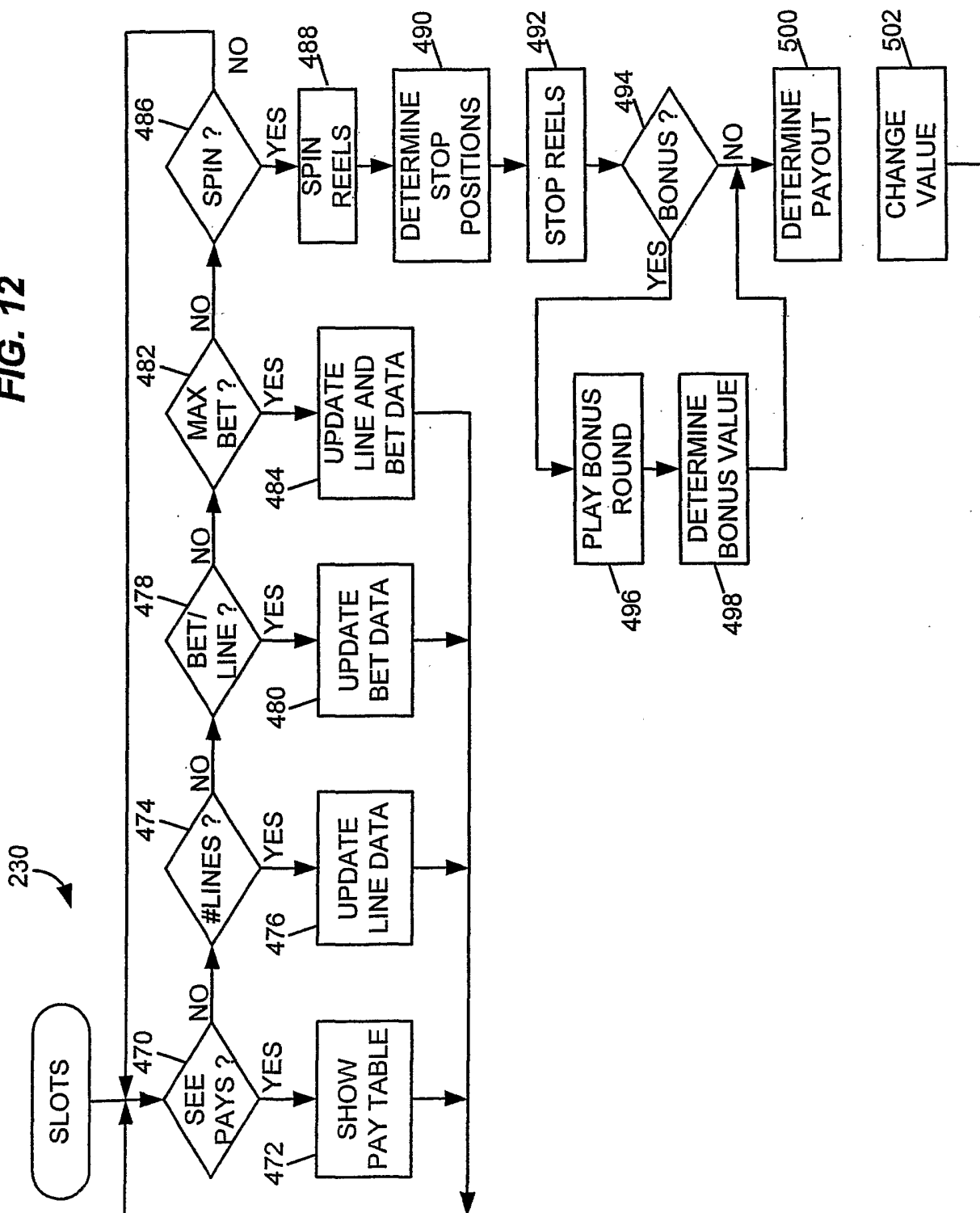
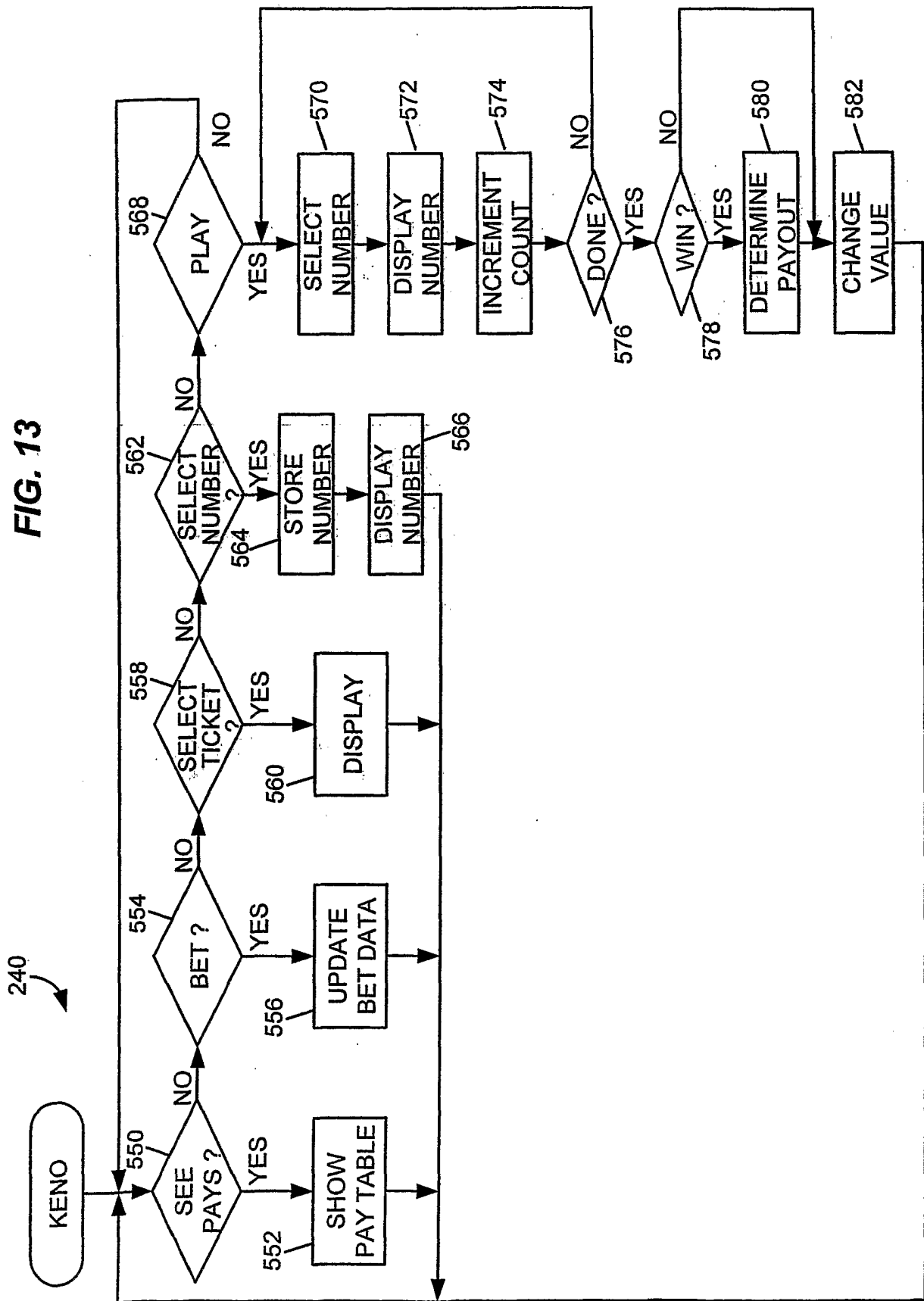


FIG. 13



600
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FIG. 14

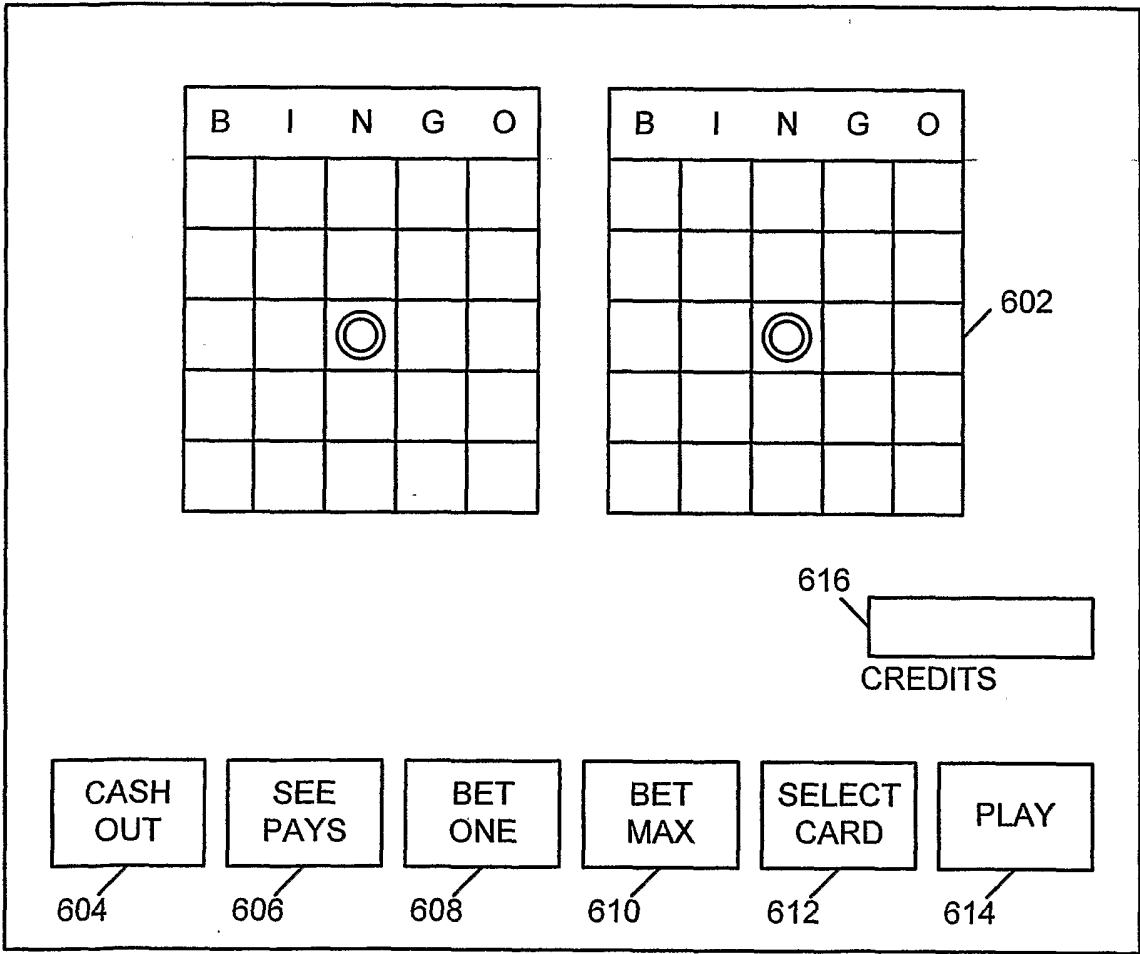
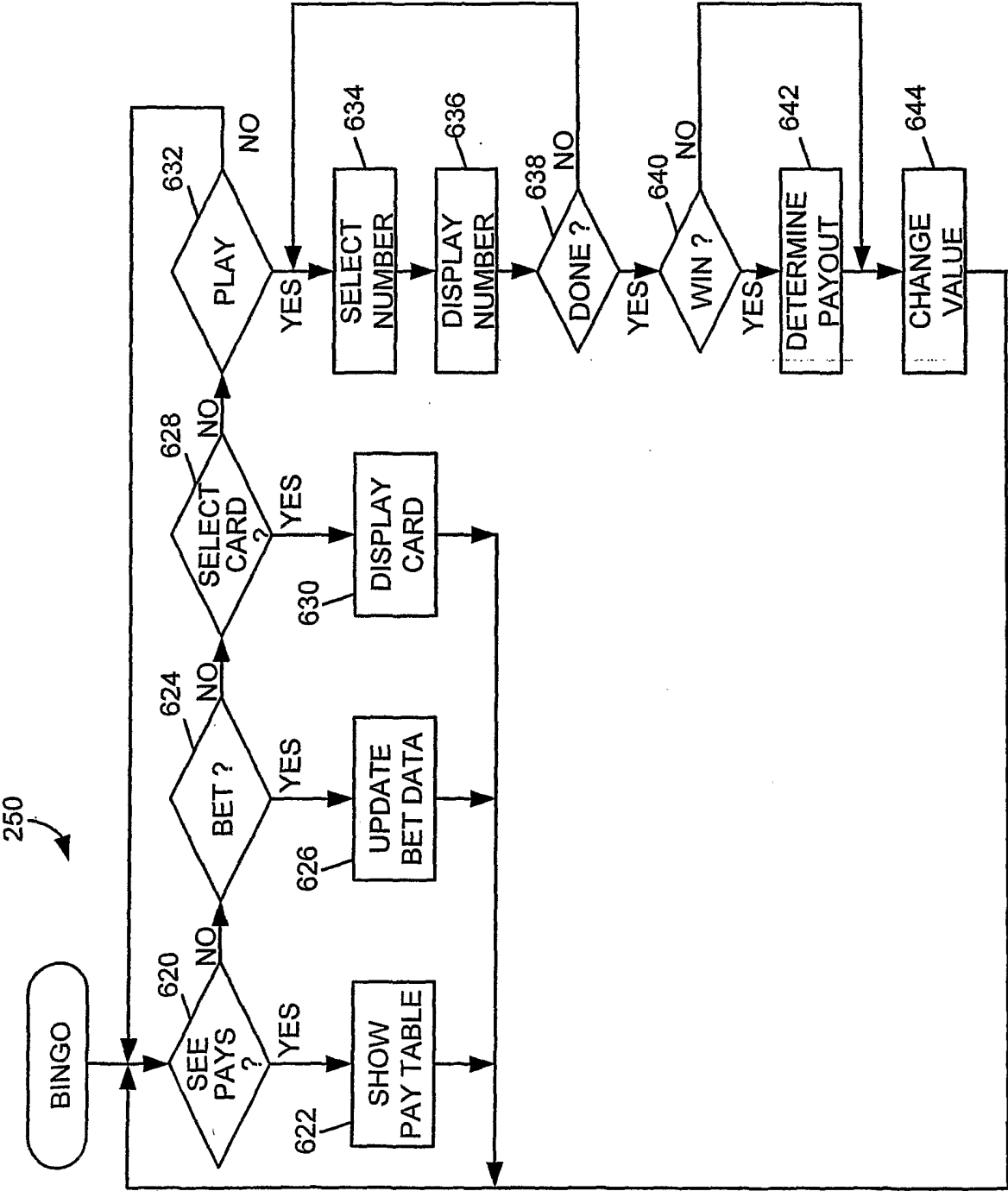


FIG. 15



INTERNATIONAL SEARCH REPORT

Application No

/US2005/025636

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G07F17/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G07F G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/058878 A (IGT) 17 July 2003 (2003-07-17)	1-4, 6, 8-11, 13, 16-22, 25
Y	the whole document	5, 7, 12, 14, 15, 23, 24, 26-48
Y	----- ANONYMOUS: "Toshiba debuts first full-color "system on glass" (SOG) input display with image capture technology" DAILY PDA TODAY NEWS, 'Online! 25 May 2004 (2004-05-25), XP002351532 Retrieved from the Internet: URL: http://www.pdatoday.com/more/A1622_0_1_0_M > 'retrieved on 2005-10-26! the whole document ----- -/-	5, 7, 12, 14, 15, 23, 24, 26-48

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

27 October 2005

Date of mailing of the international search report

15/11/2005

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Van Dop, E

INTERNATIONAL SEARCH REPORT

Application No
/US2005/025636

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	US 2004/192438 A1 (WELLS WILLIAM R ET AL) 30 September 2004 (2004-09-30) paragraphs '0073!, '0094!, '0095!, '0211! -----	1-48

INTERNATIONAL SEARCH REPORT

Information on patent family members

Application No

/US2005/025636

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			CA	2472565 A1		17-07-2003
			EP	1461895 A1		29-09-2004
			US	2003131265 A1		10-07-2003
US 2004192438	A1	30-09-2004	WO	2004095384 A1		04-11-2004