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(54) **GAMING MACHINE WITH BUTTON PANEL FEATURES**

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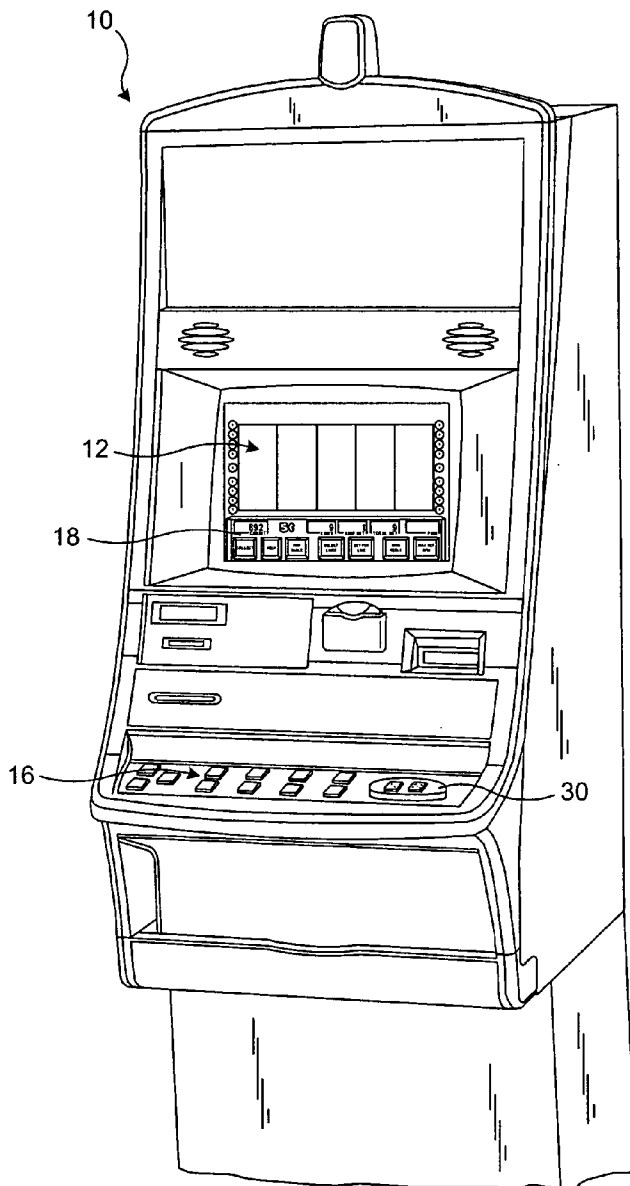
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(57) **ABSTRACT**

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A gaming machine for conducting a wagering game includes a player-actuated button containing a representation of a variable dice outcome affecting events in the wagering game.



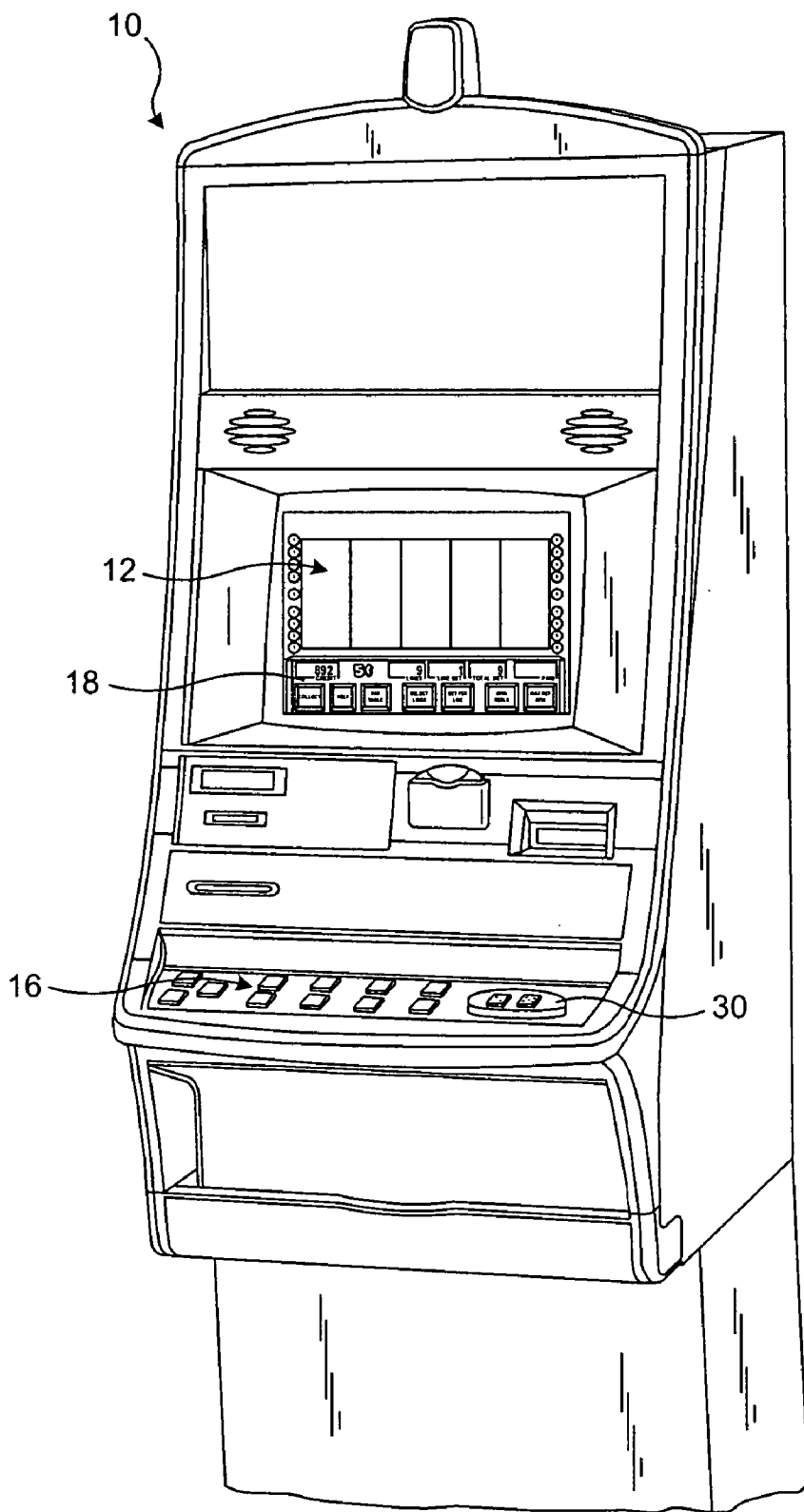


FIG. 1

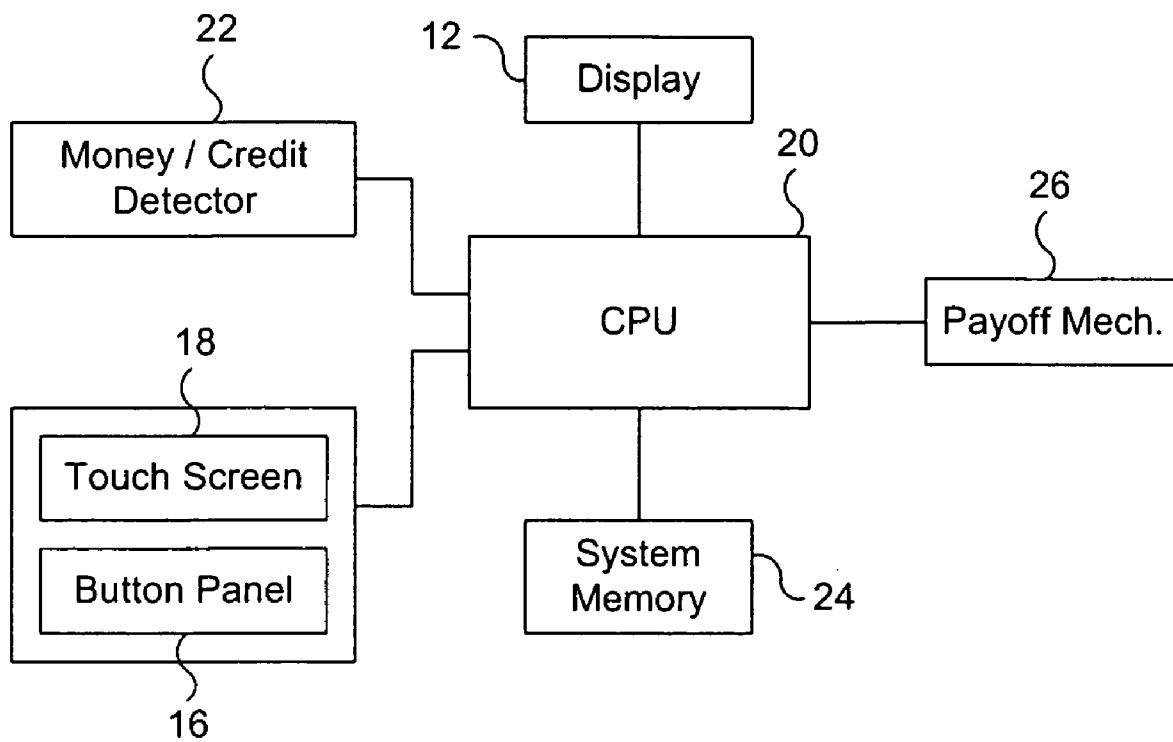


FIG. 2

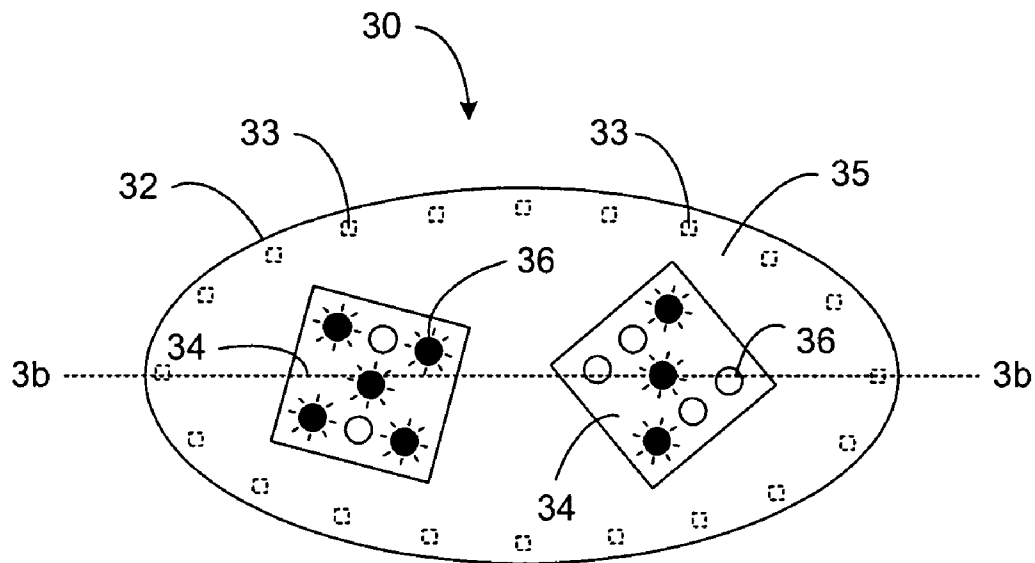


FIG. 3a

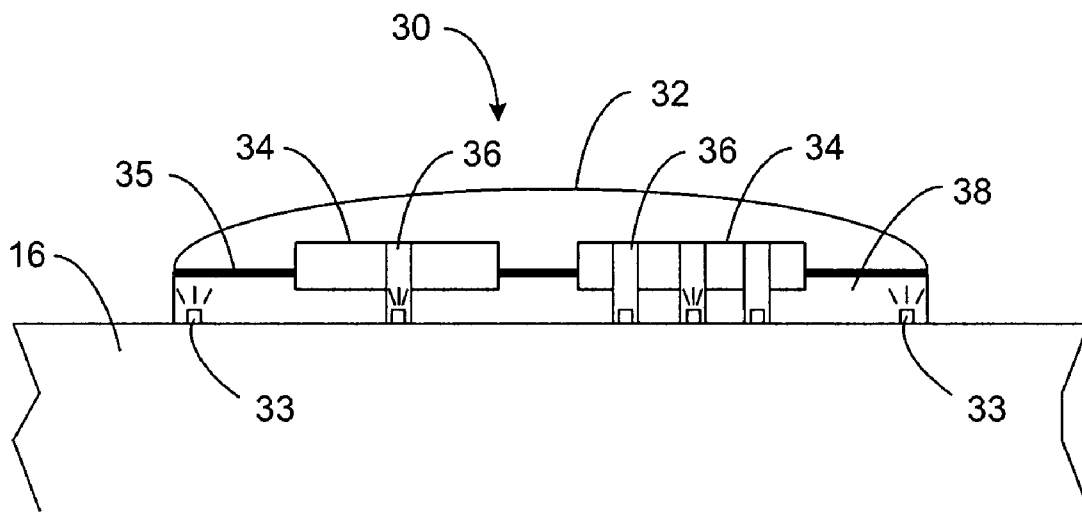


FIG. 3b

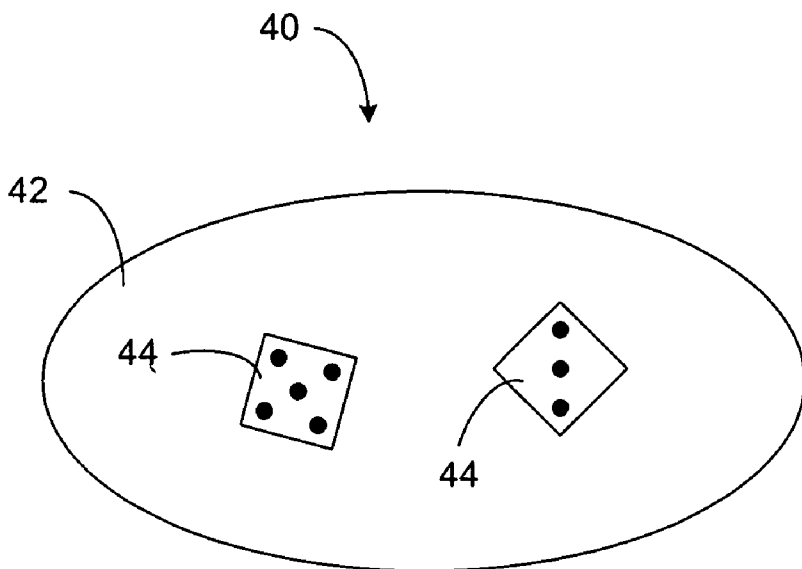


FIG. 4a

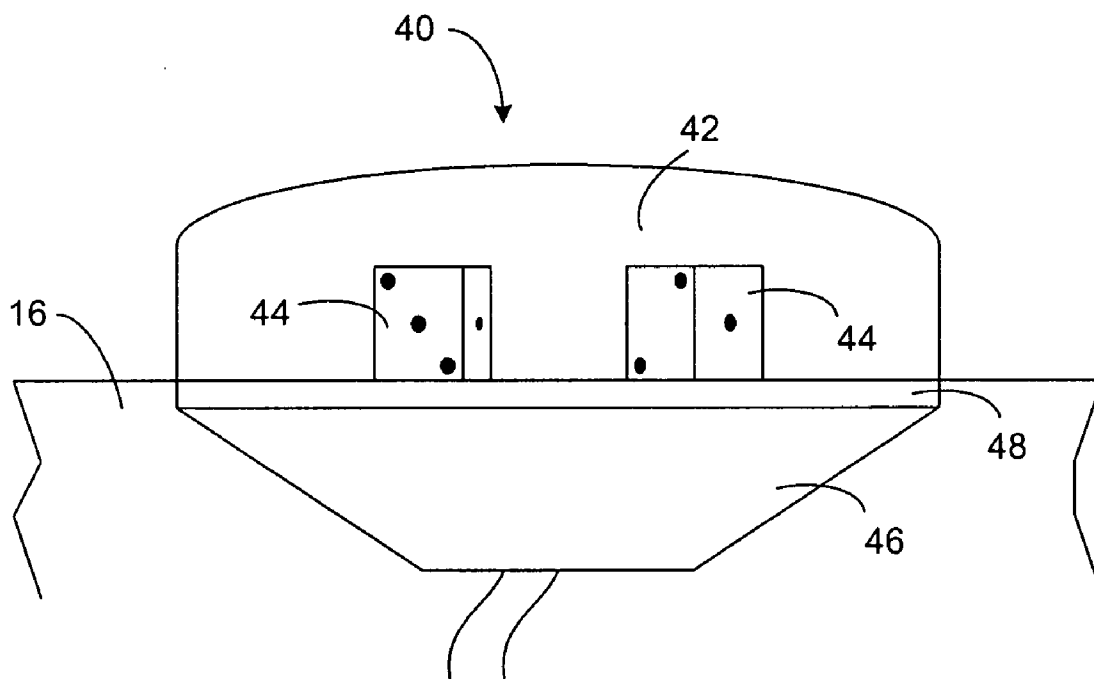


FIG. 4b

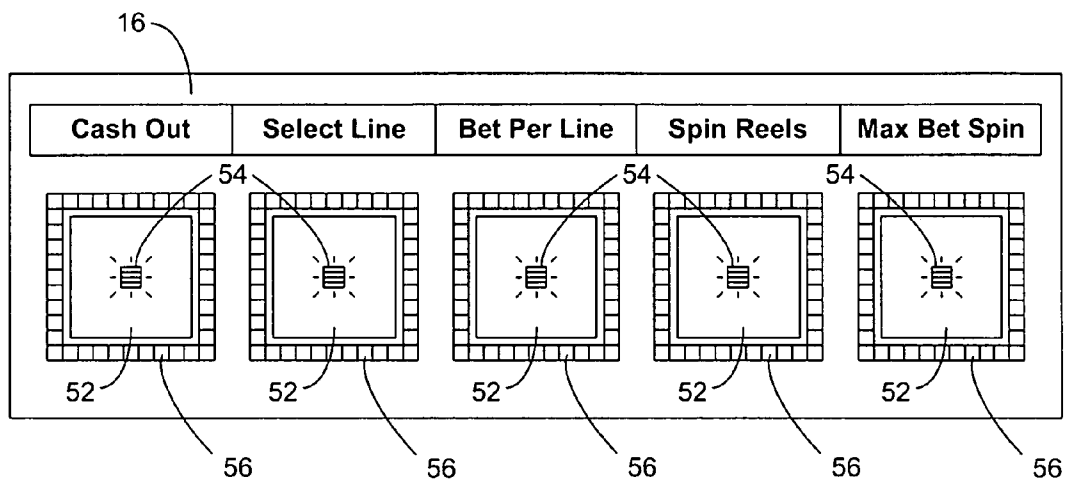


FIG. 5a

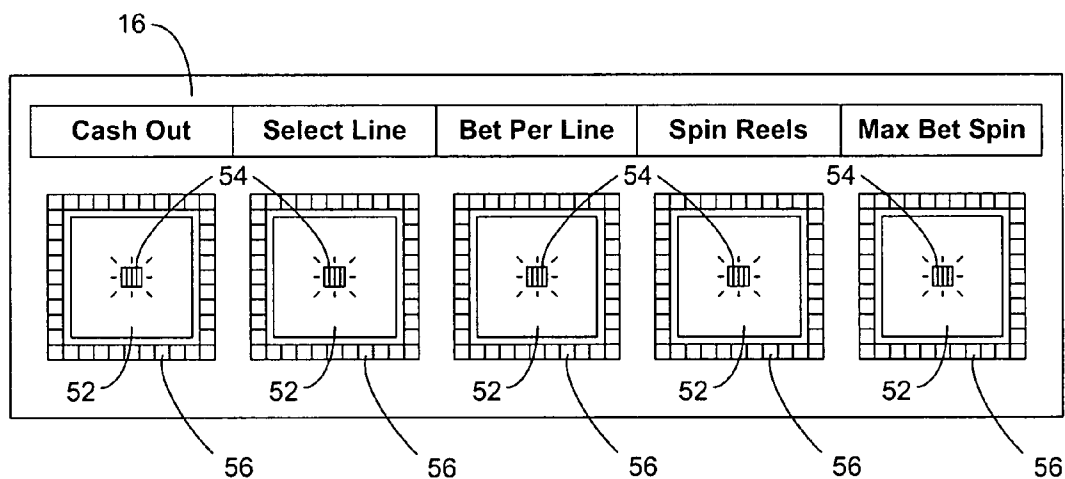


FIG. 5b

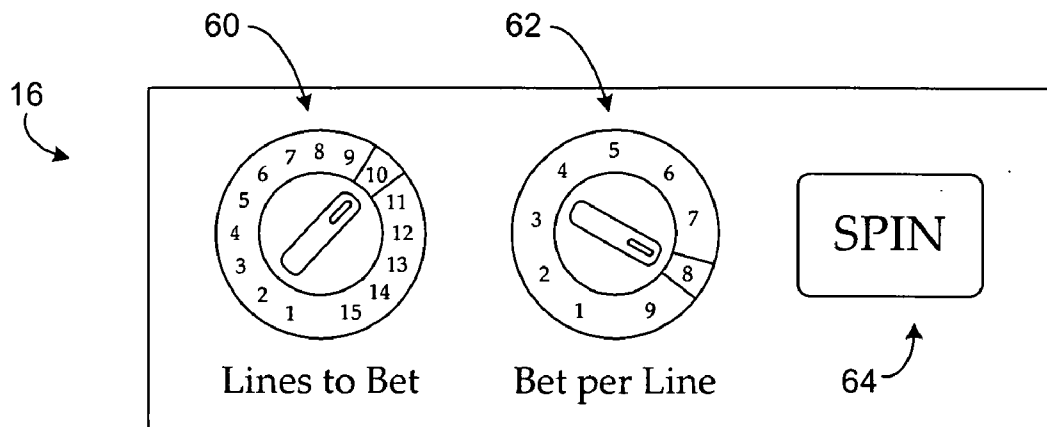


FIG. 6a

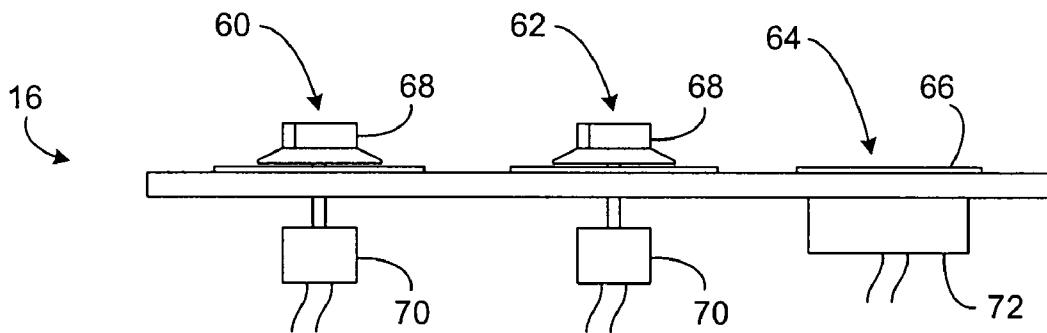


FIG. 6b

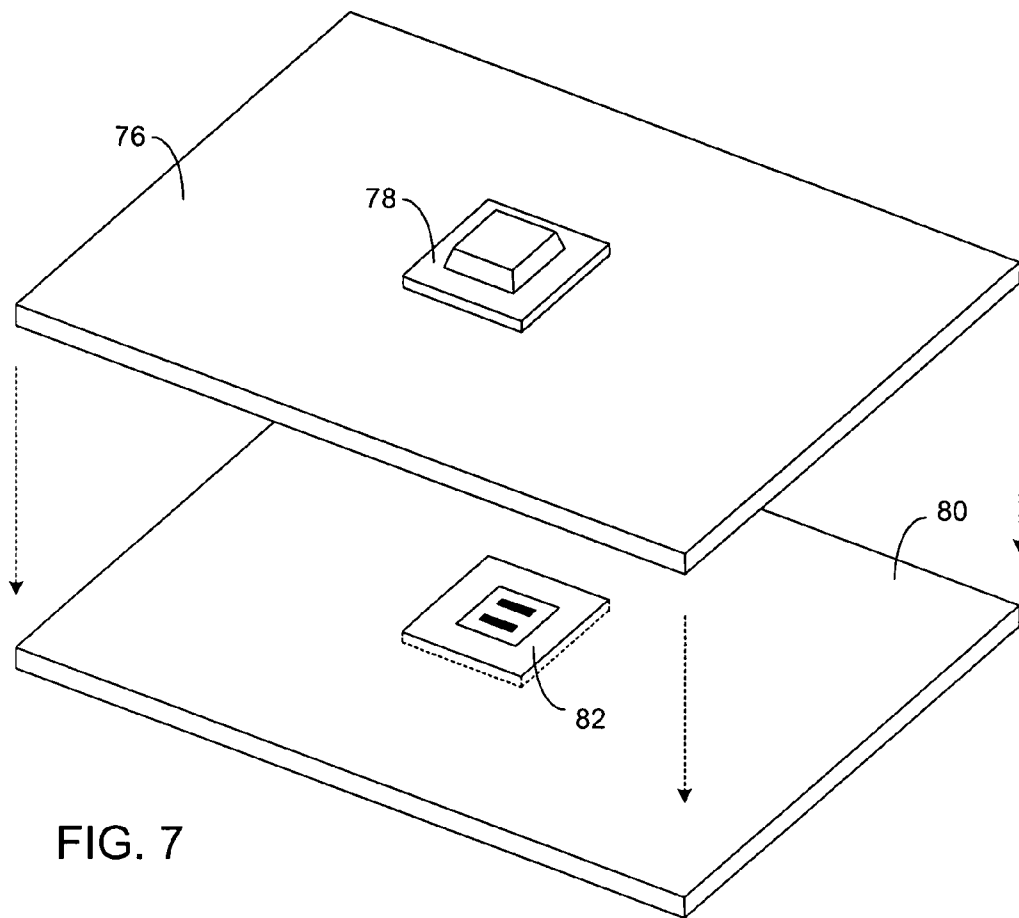


FIG. 7

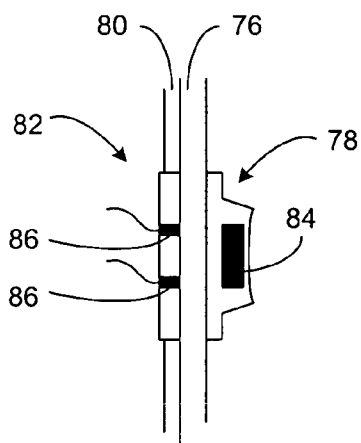


FIG. 8a

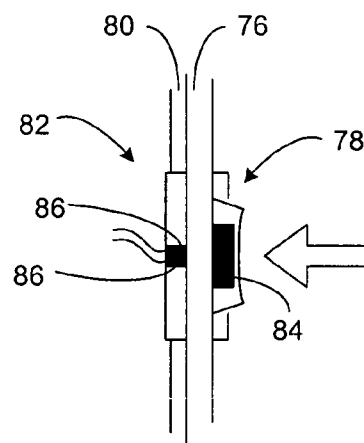


FIG. 8b



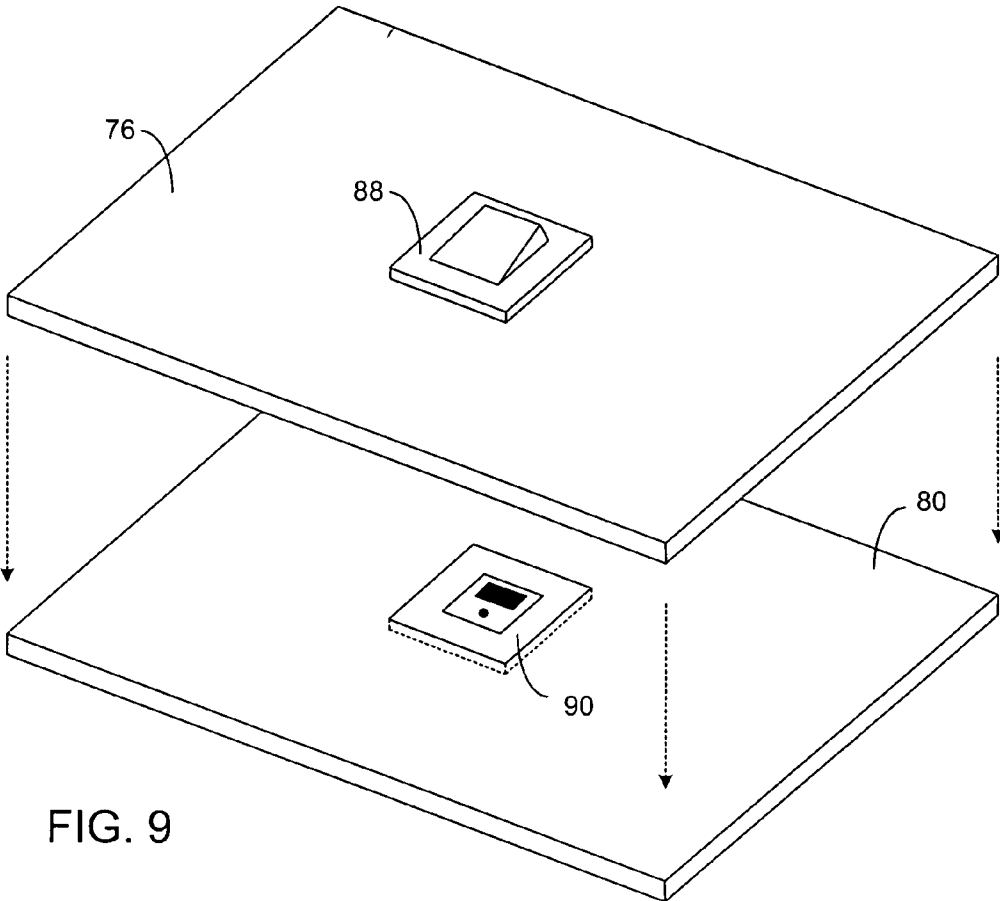


FIG. 9

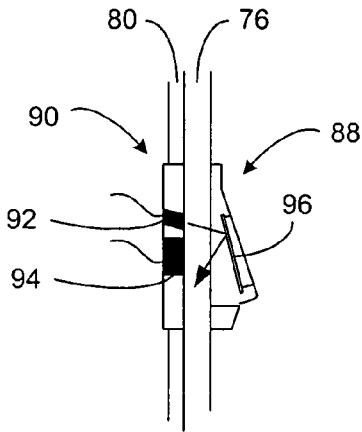


FIG. 10a

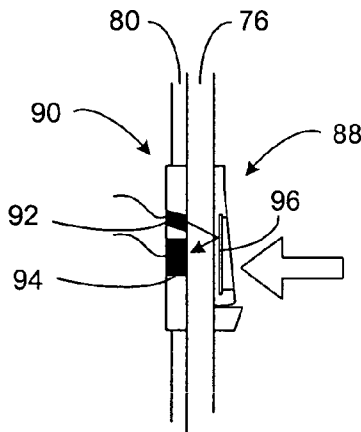


FIG. 10b

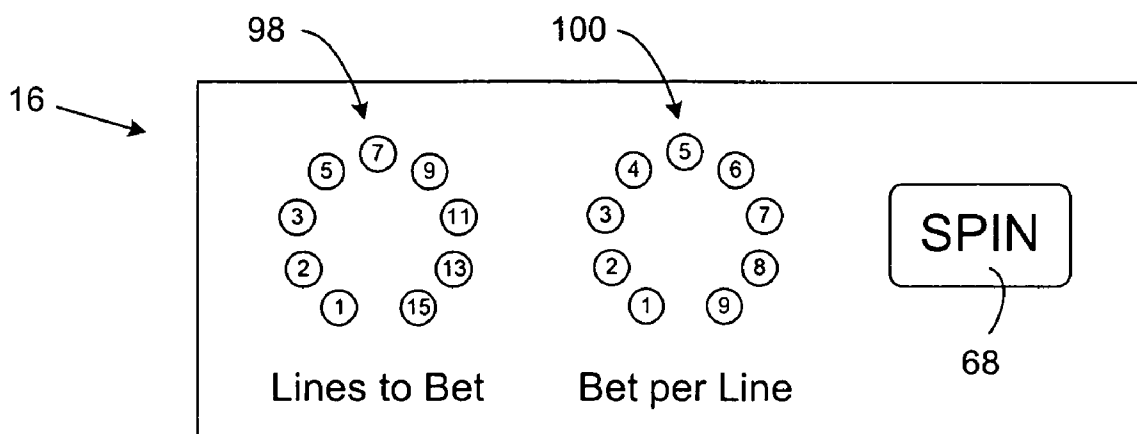


FIG. 11

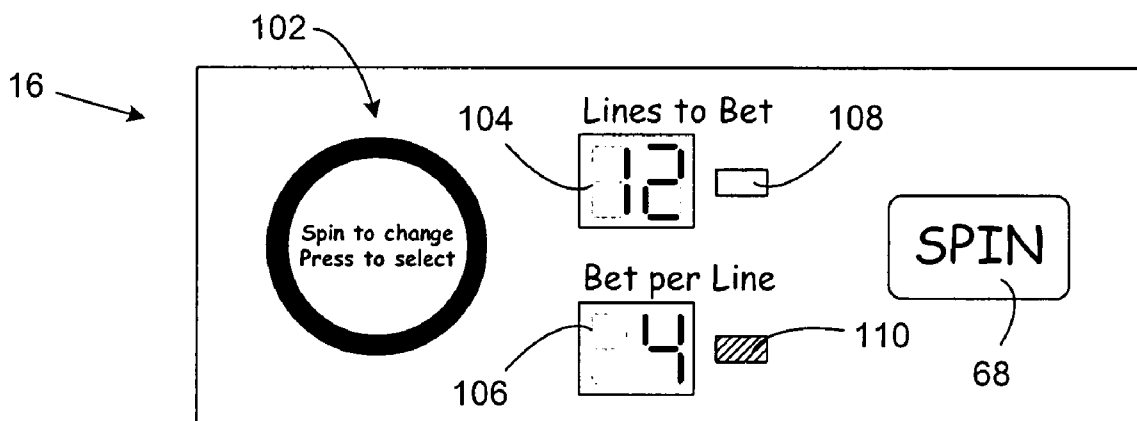


FIG. 12

**GAMING MACHINE WITH BUTTON PANEL FEATURES**

**FIELD OF THE INVENTION**

[0001] The present invention relates generally to gaming machines and, more specifically, to a gaming machine with button panel features.

**BACKGROUND OF THE INVENTION**

[0002] Gaming machines, such as slot machines, video poker machines and the like, have been a cornerstone of the gaming industry for several years. Generally, the popularity of such machines with players is dependent on the likelihood (or perceived likelihood) of winning money at the machine and the intrinsic entertainment value of the machine relative to other available gaming options. Players also appreciate the reliability of a gaming machine, as do the casino operators. Shrewd operators consequently strive to employ the most entertaining, exciting, and reliable machines available because such machines attract frequent play and hence increase profitability to the operator.

[0003] Players of gaming machines have been presented with a variety of interface methods for entering commands into the gaming machine. Typical interface components are buttons, touch screen panels, and the traditional lever. Modern gaming machines are moving away from the lever and focusing more on touch screen and button technologies. The convenience of these offerings helps speed up the play of the games and causes much less exertion to the player.

[0004] Buttons on gaming machines have evolved over the years, most notably changing in shape and lighting. While many varieties, lighting types, and purposes exist today, the focus of the buttons has always been primarily to initiate commands. While the advent of the button panel has increased the rate of play and made it easier for the player to conduct the game, the buttons themselves have only provided input to the gaming machine from the player and have had very little to do with information feedback.

[0005] To increase the entertainment value of a game and create additional development and theme possibilities, variations on the button panel and to the buttons themselves would offer the gaming machine manufacturer additional latitude to help support unique themes and provide a variety of feedback to the player via unique interactive features.

**SUMMARY OF THE INVENTION**

[0006] The present invention provides a player-actuated button on a gaming machine for conducting a wagering game. The button includes a representation of a variable dice outcome affecting events in the wagering game. Other button features are also disclosed herein.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0007] The foregoing and other advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings in which:

[0008] **FIG. 1** is an isometric view of a gaming machine embodying the present invention;

[0009] **FIG. 2** is a block diagram of a control system suitable for operating the gaming machine;

[0010] **FIG. 3a** is a top view of a dice button according to one embodiment;

[0011] **FIG. 3b** is a side view of the dice button in **FIG. 3a**;

[0012] **FIG. 4a** is a top view of a dice button according to an alternative embodiment;

[0013] **FIG. 4b** is a side view of the dice button in **FIG. 4a**;

[0014] **FIGS. 5a and 5b** are top views of a button panel with multicolored buttons illuminated in first and second colors, respectively;

[0015] **FIG. 6a** is a top view of a button panel with dials used to select and enter wagering information into the gaming machine;

[0016] **FIG. 6b** is a side view of the button panel in **FIG. 6a**;

[0017] **FIG. 7** is an exploded isometric view of a button assembly including a button capable of functioning on or through an LCD and backlighting panel according to one embodiment;

[0018] **FIGS. 8a and 8b** are unexploded side views of the button assembly in **FIG. 7** with the button in the open and closed positions, respectively;

[0019] **FIG. 9** is an exploded isometric view of a button assembly including a button capable of functioning on or through an LCD and backlighting panel according to another embodiment;

[0020] **FIGS. 10a and 10b** are unexploded side views of the button assembly in **FIG. 9** with the button in the open and closed positions, respectively;

[0021] **FIG. 11** is a top view of a button panel with display meters and a contemporary knob used to select and enter wagering information into the gaming machine; and

[0022] **FIG. 12** is a top view of a button panel with phone-style buttons used to select and enter wagering information into the gaming machine.

[0023] While the invention is susceptible to various modifications and alternative forms, specific embodiments have been shown by way of example in the drawings and will be described in detail herein. However, it should be understood that the invention is not intended to be limited to the particular forms disclosed. Rather, the invention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

**DESCRIPTION OF SPECIFIC EMBODIMENTS**

[0024] **FIG. 1** depicts a gaming machine **10** operable to conduct a slot-based wagering game. In operation, the gaming machine receives a wager from a player to purchase a "play" of the game. In a "play" of the game, the gaming machine generates at least one random event and provides an award to the player for a winning outcome of the random event. The random event may be internally or remotely determined using a random number generator or pooling

schema. To portray the random event and outcome to the player, the gaming machine includes a primary display 12. If the wagering game is a reel slot game, for example, the primary display 12 includes a plurality of symbol-bearing reels that are rotated and stopped to place symbols on the reels in visual association with the pay line. The game could also include games such as poker, keno, blackjack, roulette or any other electronic wagering game.

[0025] The primary display 12 may be implemented with a CRT, LCD, plasma, mechanical reels (in the case of a reel slot game), or other type of display known in the art. The primary display 12, especially if implemented in video, may be overlaid with a touch screen to facilitate interaction with the player. In the illustrated embodiment, the gaming machine 10 is an “upright” version in which the primary display 12 is oriented vertically relative to the player. Alternatively, the gaming machine may be a “slant-top” version in which the primary display 12 is slanted at about a thirty-degree angle toward the player of the gaming machine 10.

[0026] FIG. 2 is a block diagram of a control system suitable for operating the gaming machine. Money/credit detector 22 signals a central processing unit (CPU) 20 when a player has inserted money or played a number of credits. Using a button panel 16 and/or a touch screen 18 (also see FIG. 1), the player may select any variables associated with the wagering game and place his/her wager to purchase a play of the game. In a play of the game, the CPU 20 generates at least one random event using a random number generator (RNG) and provides an award to the player for a winning outcome of the random event. Alternatively, the random event may be generated by a remote computer using an RNG or pooling schema and then transmitted to the gaming machine. The CPU 20 operates the display 12 to represent the random event(s) and outcome(s) in a visual form that can be understood by the player. In addition to the CPU 20, the control system may include one or more additional slave control units for operating the display 12 and any secondary displays.

[0027] System memory 24 stores control software, operational instructions and data associated with the gaming machine. In one embodiment, the system memory 24 comprises a separate read-only memory (ROM) and battery-backed random-access memory (RAM). However, it will be appreciated that the system memory 24 may be implemented on any of several alternative types of memory structures or may be implemented on a single memory structure. In fact, the system memory 24 may be located locally or remotely over a network. A payoff mechanism 26 is operable in response to instructions from the CPU 20 to award a payoff to the player. The payoff may, for example, be in the form of a number of credits. The number of credits is determined by one or more math tables stored in the system memory 24.

[0028] FIG. 3a is a top view of a dice button 30 containing square objects with multiple light points representing dice. “Dice” 34 are in a fixed position and may be encased or suspended in a clear acrylic or other clear material 32. The dice 34 may also be embedded or connected to a base 38 (see FIG. 3b) and covered by a clear cap comprised of acrylic or other clear material. In this example, the dice 34 are embedded in the base 38 with a surface 35 around the dice 34 being opaque. The dice 34 are transparent and may be of a variety

of colors depending on the theme and other requirements of the game. Light emitting diodes (LEDs) 33 are positioned around the outer edge of the button under the surface 35. The LEDs 33 illuminate the area beneath the surface 35 and light passes through the translucent dice 34 as initiated by the game. This provides a “glow” to the dice when the LEDs 33 are lit. LEDs 36 are positioned to represent the spots on a regular six-sided die and can produce all of the possible outcomes of a typical dice combination and, depending on the requirements of the game, non-standard combinations. Upon pressing the dice button 30, a random combination of recognizable numeric values are displayed on the dice 34. The dice button 30 can be used to realize a value for an award, or may be used to initiate movement, such as on a gaming board on a display. In this example, the dice 34 are representing a “roll” of eight. When the dice button 30 is pressed, it activates a switch or actuator that initiates a random number generator on the gaming machine’s controller that randomly determines a number between one and twelve (or other values depending on the type of dice and the possible numeric values). The result is transmitted back to the dice button 30 and is displayed by illuminating the appropriate LEDs 36 on the dice 34. While this example shows a typical dice pair, it should be recognized by those with ordinary skill in the art that any numeric value displayed on any type of dice that can support a numeric value is also viable. FIG. 3b is a side view of the dice button 30. The base 38 is connected to the button panel 16. In this example, dice 34 are embedded in the base 38 with a clear cap or cover 32.

[0029] FIG. 4a is a top view of a dice button 40 in accordance with an alternative embodiment. This example uses physical dice 44 to generate an outcome. A clear acrylic or other clear material is used as a cover 42 allowing an unobstructed view of the dice 44 within the button 40. FIG. 4b is a side view of the dice button 40 with physical dice 44. A charge-coupled device (CCD) 46 receives images of the dice 44 through a lens member 48. The images are of the bottom of the dice 44. The images are sent to the gaming machine’s controller for instant analysis and determination of the outcome. The controller converts the number realized by the images into the number displayed on the top of the dice 44. Further information regarding the determination of a dice roll outcome using a CCD is disclosed in U.S. Pat. No. 6,609,710 to Order, incorporated herein by reference in its entirety. The “rolling” of the dice when the dice button 40 is pressed is accomplished using a vibration device, magnetic field generator, or spring-loaded plate, but is not limited to these methods. Other methods of “reading” the dice outcome include contact points, internal chips, magnetic strips, laser scan, infrared, or proximity device.

[0030] Another aspect of the present invention includes the use of colored lights to identify particular game play modes or valuations. FIG. 5a is a top view of a button panel 16 for use with an electromechanical or video reel slot gaming machine. In this example, each button 52 includes a multicolor light emitting diode (LED) 54 used to backlight each button. Alternatively, the backlighting can be performed by a cluster of LEDs of different colors. The color in this example is blue. FIG. 5b shows the button panel 16 and a change in the color of the LED (or LED cluster) 54 as the game state changes. In this example, a red color is displayed. Game state examples include, but are not limited to base game, bonus game, free spin round, winning outcome,

losing outcome, multiplier state, reels in motion, and others. Any of these game states can be identified with a specific color emanating from the LEDs 54. Another identifying feature for game state on the buttons 52 can be flashing LEDs or a specific sequence of flashing during a particular game state. Combinations of flashing and color can be used to signify a particular game state. For example, flashing a green color on the buttons 52 in sequence could represent a winning outcome. Random flashing of random colors on all buttons 52 would represent the state the game is in during the spinning of the reels. Flashing a red color simultaneously on all buttons 52 would represent a losing outcome.

[0031] Another aspect of identifying certain modes of a gaming machine is the use of multicolored LEDs to represent denominations or value. As reinforcement to the color on a tower light that denotes the denomination of a gaming machine, buttons 52 on the same gaming machine could also be lit in the same color as the color on the tower light. For example, if the color for a 25-cent gaming machine is yellow, the button LEDs 54 can be programmed to have a permanent or initial backlighting color of yellow. Should the casino use the tower light colors for other purposes than denomination, the buttons 52 could be configured to represent any color scheme deemed necessary. In multi-denomination gaming machines, the backlighting color can change when the player selects the denomination.

[0032] The color of the buttons 52 can also be used to represent a bet amount during free spins, signify the number of free spins, identify the number of active pay lines, identify multipliers, identify a particular player selection, and as a method of identifying additional bet amounts (such as a bonus amount extended by the game) added to the player's initial bet. Buttons 52 that can be lit with a variety of colors can represent value schemes. For example, a color scheme of gold, silver, and bronze can be used to denote the value of a free spin round. The player would recognize the potential of the outcome of a free spin round based on the color being presented on the machine, including the buttons 52. The color of the buttons 52 could be coordinated with reel symbol colors to represent a major prize or the potential of receiving a prize. FIGS. 5a and 5b also show LEDs 56 surrounding each button 52. The LEDs 56 can be used for additional lighting effects, can provide single or multicolored lighting, and can match the colors and effects of the LEDs 54 backlighting the buttons 52.

[0033] FIG. 6a is a top view of a button panel 16 using dials to input information into the gaming machine. While the style presented may be a result of design requirements due to a certain theme, the mechanisms in this example show specific input information required by a reel slot machine to perform the expected action of applying a player-selected wager to a player-selected number of pay lines, initiating the movement of the reels in response to the player's physical input, and thus presenting the results of all inputs. Lines to Bet dial 60 displays the number of lines of the available pay lines on the reel display that a player can enable. In this example, the player may enable a maximum of 15 pay lines or any number less than 15 pay lines. It should be apparent to those of ordinary skill in the art that any number or set of numbers supported by the pay lines on the reel display may be presented on the Lines to Bet dial 60 and is only dependent on the final configuration of the game. A Bet per Line dial 62 has the same characteristics as the Lines to Bet

dial 60 but controls a different aspect of the game. The Bet per Line dial 62 controls the number of credits or coins the player wants to wager for each pay line selected using the Lines to Bet dial 60. In this example, the player has selected 10 pay lines using the Lines to Bet dial 60 and is wagering eight (8) credits or coins for each pay line using the Bet per Line dial 62. A total of eighty credits or coins are therefore being wagered. A spin button 64 is used to initiate the spinning of the reels.

[0034] FIG. 6b is a side view of button panel 16 with the Lines to Bet dial 60, the Bet per Line dial 62, and the spin button 64, all showing examples of internal components used to communicate the player selections to the gaming machine. Lines to Bet dial 60 uses the combination of a dial knob 68 and a potentiometer or incremented switch 70 to electromechanically signal the gaming machine's controller of the number of pay lines the players wants to play. Similarly, the Bet per Line dial 62 also uses the combination of a dial knob 68 and a potentiometer/incremented switch 70 to signal the controller of the player's intended bet amount per pay line. Spin button 64, in this example, is a typical push-button switch comprised of a faceplate 66 and a momentary contact switch assembly 72. Other button types may be used in this example and include, but are not limited to, capacitive, resistive, magnetic switch, electromechanical switch, membrane switch, and elastomeric, a technology used on devices such as television remote controls.

[0035] FIG. 7 is an exploded isometric view of a button 78 capable of functioning on or through an LCD 76 and backlighting panel 80. An electromagnetic switch base 82 is incorporated into the backlighting panel 80. FIG. 8a is an unexploded side view showing the button 78 in the open position. Note that the button 78 is affixed to the surface of LCD 76. A number of methods can be used to attach the button 78 to the surface of the LCD 76 including 3M™ VHB™ tape, two-part adhesive, and chemical bond. A magnet 84 is positioned within the body of button 78. The switch base 82 is positioned within a cutout of the backlighting panel 80. A magnet pair 86 is contained within the switch base 80. The magnet pair 86 is connected via wiring and circuits to the controller of the gaming machine. FIG. 8b is an unexploded side view showing the button 78 in the closed or depressed position. As the magnet 84 reaches the surface of the LCD 76, the proximity to the magnet pair 86 within the switch base 82 causes the two magnets 86 to move together completing a circuit. The controller recognizes the completed circuit and initiates the appropriate action based on what the button is configured to do when pressed.

[0036] FIG. 9 is an exploded isometric view of an alternative embodiment of a surface mounted button on an LCD. Specifically, the surface mounted button is in the form of a rocker switch 88 affixed to the surface of LCD 76. A number of methods can be used to attach the switch 88 to the surface of the LCD 76 including 3M™ VHB™ tape, two-part adhesive, and chemical bond. Switch base 90 is positioned within a cutout in backlighting panel 80. FIG. 10a is an unexploded side view of the switch 88 in the open position. A mirror 96 is positioned within the body of the rocker switch 88. Infrared (IR) transmitter 92 and IR receiver 94 are incorporated into the switch base 90. The angle of transmission for the IR transmitter 92 is such that the continuous narrow-band IR beam passes through the LCD 76 and

reflects off of the mirror **96** within rocker switch **88** and disperses harmlessly within the assembly. **FIG. 10b** is an unexploded side view of the switch **88** in the closed or depressed position. As the rocker switch **88** is pressed, the angle of the mirror **96** is altered and the IR beam transmitted by IR transmitter **92** is reflected into IR receiver **94**. IR receiver **94** is connected circuitously to the gaming machine's controller. The controller recognizes the receipt of the IR signal and initiates the appropriate action based on the rocker switch's predetermined use and configuration.

[0037] While the present invention has been described with reference to one or more particular embodiments, those skilled in the art will recognize that many changes may be made thereto without departing from the spirit and scope of the present invention.

[0038] For example, **FIG. 11** provides an alternative look to the button panel **16** described in **FIG. 6a** and can be used to accentuate a telephone theme on a particular gaming machine. The phone appearance is produced in this example with the Lines to Bet **98** and the Bet per Line **100** controls configured in a phone button arrangement. A separate Spin button **68** is also part of the button panel **16** and is designed to compliment the look and feel of the telephone-style interface. Membrane switches or physical pushbuttons can be used to create the style of all the buttons in this embodiment. **FIG. 12** presents a modem look for themes that may be technical or futuristic. An alternative to the common pushbutton style of configuring betting parameters is offered in this example. Knob **102** is used to switch between the Lines to Bet meter **104** and the Bet per Line meter **106**. When the knob **102** is turned, a light **108** or **110** is illuminated next to a meter signifying that that meter is capable of being configured. In this example, the Bet per Line light **110** is illuminated identifying that the Bet per Line meter **106** may be altered. Altering either meter is accomplished by pressing the knob **102** a number of times to increment the number on the meter until the desired result is realized. A separate Spin button **68** is also part of the button panel **16** and is designed to compliment the look and feel of the futuristic interface.

[0039] Other examples include buttons that accommodate a forced feedback sensation to the player. This includes such sensations as vibration, sharp click or knock, shaking, or expanded visual feedback such as from a video display incorporated into the button. Other sensations can also be used such as varying textures on buttons for recognition or for accommodating a theme. For example, a button could have a rough, sandy texture for a game relating to construction or the beach. The entire button could have a jelly-like texture for themes relating to aliens or the sea. The shape of the buttons can also be theme-related, taking on characteristics such as shaping buttons to look like fish in a sea-themed game. Locations of certain buttons can be associated with game themes such as positioning buttons on the sides of the gaming machine to control flippers or other aspects of a pinball-related game. Biometric sensors can be included in buttons to identify players for player tracking purposes, security, or other areas where identity is necessary.

[0040] Further examples include self-actuating buttons similar to a self-playing piano. A "ghost" pressed button can be used in a gaming machine with a haunted or ghost theme. The machine could "take over" the controls from the player

during a bonus round to deliver the best possible outcome when playing a selection game, for example.

[0041] To increase the functionality of a gaming machine without increasing the number of buttons on the button panel, a shift or courting button can be used similar to a computer keyboard or typewriter. The gaming machine can identify a shift mode by changing the colors of the buttons when the shift button is pressed. Other ways to identify the shift mode are changing the text on a button's display, using LED flashing and/or forced feedback such as a vibration or strong click.

[0042] Another alternative to the gaming machine with a fixed button panel is the use of a play-owned controller or button panel. This embodiment allows the player to have a personally configured physical arrangement that is comfortable and makes introductions to new games supporting this feature easier and less intimidating. A number of methods of supporting player-owned controllers exist today in other fields and standard interconnections exist supporting this concept. One method is described and is disclosed in U.S. Pat. No. 6,475,083 Gomez, et al, incorporated herein by reference in its entirety. When a player "plugs in" a personal controller, the gaming machine identifies it and verifies that it is a compatible device for interaction with the gaming machine. It may also run a variety of checks and tests to determine if the unit has been tampered with or if any malfunction exists that may alter the outcome of the game.

[0043] Each of these embodiments and obvious variations thereof is contemplated as falling within the spirit and scope of the claimed invention, which is set forth in the following claims.

1. A gaming machine for conducting a wagering game, comprising:

a player-actuated button containing a representation of at least one variable die outcome, the die outcome affecting an event in the wagering game.

2. The machine of claim 1, wherein the representation of the variable die outcome includes an element resembling a die and lighting devices representing spots on the die.

3. The machine of claim 2, wherein the element is a translucent surface or body to be illuminated.

4. The machine of claim 1, further including a controller, the die outcome being communicated between the controller and the button.

5. The machine of claim 1, further including a display for replicating the die outcome.

6. The machine of claim 1, wherein the representation of the variable die outcome includes a physical die.

7. The machine of claim 6, wherein a surface opposite a viewed surface of the die presents data for identifying the die outcome to a controller.

8. The machine of claim 7, wherein the data is transmitted to the machine by methods selected from the group consisting of magnets, infrared, and a coded image.

9. The machine of claim 1, wherein the representation of the variable die outcome includes a video display.

10. The machine of claim 1, further including a board game having a game piece, wherein the die outcome initiates and controls movement of the game piece along the board game.

11. The machine of claim 1, wherein the die outcome is used in a bonus game or other dice-related game.

12. The machine of claim 1, wherein the button is located on a button panel.

13. The button of claim 1, wherein the button is located on a surface other than the button panel.

14. A player-actuated button for use with a gaming machine that conducts a wagering game, the button comprising a representation of a variable die outcome, the die outcome affecting an event of the wagering game.

15. The button of claim 14, the representation of a variable die outcome includes a structure resembling a die and lighting devices representing spots.

16. The button of claim 15, wherein the structure is a translucent surface or body that can be illuminated.

17. The button of claim 14, wherein the die outcome is transmitted to a controller of the gaming machine.

18. The button of claim 14, wherein the die outcome is replicated on a machine display.

19. The button of claim 14, wherein the representation of the variable dice outcome includes a physical die.

20. The button of claim 19, wherein a surface opposite a viewed surface of the physical die contains data for identifying the die outcome to the machine.

21. The button 20, wherein the data is transmitted to the machine by methods selected from a group consisting of magnets, infrared, or coded image.

22. The button of claim 14, wherein the representation of the variable die outcome includes a video display.

23. The button of claim 14, wherein the die outcome initiates and controls the movement of a game piece on a board game.

24. The button of claim 14, wherein the dice outcome is used in a bonus game or other die-related game.

25. The button of claim 14, wherein the button is located on a button panel.

26. The button of claim 14, wherein the button is located on a surface other than the button panel.

27. A method of conducting a wagering game on a gaming machine, the method comprising:

representing a variable die outcome on a player-actuated button; and

affecting an event in the wagering game based on the die outcome.

28. The method of claim 27, wherein the representing step occurs in response to a player actuating the button.

29. The method of claim 27, wherein the representing step uses a physical die.

30. The method of claim 27, wherein the representing step uses a fixed element representing a die.

31. The method of claim 27, further including communicating the variable die outcome between the button and the machine's controller.

32. The method of claim 27, further including reading the variable die outcome using a charge-coupled device (CCD), contact points, internal chips, magnetic strips, laser scan, infrared, or proximity device.

33. The method of claim 32, further including communicating the variable die outcome to the machine's controller to cause the event.

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