A lighted gaming display device for use with a gaming machine. The display device includes a wall defining a cavity. The wall has a partially transparent portion. A player can view light emitted from within the cavity. One or more light sources are mounted in the cavity. The light sources are adapted to emit light. A distorting reflective material is mounted in the cavity. The light reflected by the distorting reflective material to the player appears different than the light incident upon the distorting reflective material.
FIG. 1
LIGHTED GAMING DISPLAY DEVICE

BACKGROUND OF THE INVENTION

[0001] 1. Field of Invention

[0002] The present invention relates to a lighted gaming display device for use with a gaming machine that distorts and reflects light. The light source is a matrix of light emitting diodes.

[0003] 2. Description of Related Art

[0004] Gaming Devices

[0005] Gaming devices are well known in the art and a large variety of gaming devices have been developed. In general, gaming devices allow users or players to play a game. In many casino-type gaming devices, the outcome of the game depends, at least in part, on a randomly generated event. For example, a gaming device may use a random number generator to generate a random or pseudo-random number. The random number may then be compared to a predefined table to determine the outcome of the event. If the random number falls within a certain range of numbers on the table, the player may win a predefined prize. The table may also contain display information that allows the gaming device to generate a display that corresponds to the outcome of the game. The gaming device may present the outcome of the game on a large variety of display devices, such as mechanical spinning reels or video screens.

[0006] Bonus Prizes

[0007] Some gaming devices award bonuses in addition to prizes that are awarded in the primary game. A bonus can be defined as an additional prize that is awarded to the player when a predefined event occurs. An example of a bonus game can be found in U.S. Pat. No. 5,848,932 issued to Adams. One of the gaming devices described in this document comprises three spinning reels and a spinning wheel bonus display. When predetermined indicia are displayed on the spinning reels of the primary game, the wheel can be activated to indicate a bonus prize. The bonus prize is awarded in addition to any prizes awarded in the primary game.

[0008] Generally, bonus prizes are offered in such games in order to increase the excitement and enjoyment experienced by players. This attracts more players to the game and encourages players to play longer. When gaming devices attract more players and the players play longer, they tend to be more commercially successful relative to other gaming devices.

[0009] Display Devices

[0010] In addition, highly visible display devices are utilized on gaming devices in order to attract players. Once players are attracted to the gaming device, they tend to play longer because the display device enhances the stimulation and excitement experienced by players. It is, therefore, desirable for gaming devices to incorporate highly visible display devices.

[0011] Display devices also tend to be more successful if they stimulate one or more of the human senses. Players are attracted to games that use light, sound and touch. Display devices that arouse the human senses are more stimulating to a game player and as a result are played for longer periods of time. This results in increased revenue for the gaming operator.

[0012] One of the mediums used in display devices to attract the attention of players is light. Many casino games have combinations of flashing lights. A portion of the present casino games use white and colored incandescent lights, some use fluorescent lights and some use neon lights.

[0013] While lights have been used in conjunction with display devices, a current unmet need exists for a display device that utilizes light to produce an image that is entertaining, attractive and yet distinctive from other lighted displays.

SUMMARY OF INVENTION


[0015] One of the advantages of the present invention is that it provides a gaming device that utilizes a highly visible display device.

[0016] A further advantage of the present invention is that it provides a display device that may be used with a primary game or a bonus game.

[0017] Another advantage of the present invention is that it provides a display device that utilizes light emitting diodes.

[0018] Another advantage of the present invention is that it provides a display device that emits distorted light.

[0019] A further advantage of the present invention is that it provides a display device that utilizes a light-distorting medium.

[0020] Another advantage of the present invention is that it provides a display device that is attractive and entertaining to game players.

[0021] Yet another advantage of the present invention is that it provides a display device that emits light in different wavelengths.

[0022] These and other advantages of the present invention may be realized by reference to other portions of the specification, claims, and abstract.

[0023] 2. Brief Description of the Invention

[0024] The present invention comprises a lighted display device for use with a gaming machine. The display device includes a wall. The wall defines a cavity and has at least a partially transparent portion. A player can view light emitted from within the cavity. One or more light emitting diodes are mounted in the cavity. The light emitting diodes are adapted to emit light. A distorting reflective material is mounted in the cavity. The light reflected by the distorting reflective material is different than the light incident on the reflective material.

[0025] The above description sets forth, rather broadly, the more important features of the present invention so that the detailed description of the preferred embodiment that follows may be better understood and contributions of the present invention to the art may be better appreciated. There are, of course, additional features of the invention that will be described below and will form the subject matter of
claims. In this respect, before explaining at least one preferred embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangement of the components set forth in the following description or as illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0026] Preferred embodiments of the present invention are shown in the accompanying drawings wherein:

[0027] FIG. 1 is substantially a front view of the gaming display device of the present invention.

[0028] FIG. 2 is substantially a top cross-sectional view of FIG. 1.

[0029] FIG. 3 is substantially a side view of FIG. 1.

[0030] FIG. 4 is substantially a schematic diagram of an electrical circuit for driving the light emitting diodes.

**DESCRIPTION OF THE PREFERRED EMBODIMENT**

[0031] Display Device

[0032] As seen in FIGS. 1-3, the present invention comprises a lighted display device, generally indicated by reference number 20. Display device 20 comprises a container 22, a wall 24, a transparent portion 26, a cavity 30, a mirror 31, a distorting reflective material 32, a light source 34 and a controller 40.

[0033] Display device 20 is mounted to a gaming device or apparatus 15. Gaming device 15 may be any of a large number of devices that are adapted to allow a game player 60 to play a game. For example, game apparatus 15 may utilize spinning reels 16 or a video display (not shown) to display outcomes of the game. Means may also be provided for accepting wagers, such as a coin slot 18 and for awarding prizes, such as a coin dispenser 19. A handle 17 is provided for activating game apparatus 15 to begin a game. Game apparatus 15 may be a primary game such as a slot machine or can be a bonus game.

[0034] Display device 20 comprises a container 22 that is adapted to hold one or more game symbols 50 inside a cavity 30. Container 22 has a curved wall 24 with an inner surface 25 that defines cavity 30. Container 22 has an outer surface 27. Container 22 has a transparent portion 26 that allows players to view the game symbols 50 inside of the container. Container 22 is made of a transparent material, such as plastic or glass. In the preferred embodiment, container 22 is made of acrylic. Suitable containers of this type may be obtained from Tripp Plastics of Reno, Nev. Container 22 may have many different shapes, such as a sphere, cube, cylinder, triangle, etc. In the preferred embodiment, container 22 is substantially cylindrical with a planar end 29 and a base 28.

[0035] A distorting reflective material 32 is mounted in cavity 30 onto wall 24. The distorting reflective material 32 is a surface holographic embossed polyester film commercially available from Spektratek Technologies, Inc., Los Angeles, Calif. The film is mounted to wall 24 using an adhesive. The distorting reflective material 32 is adapted to distort light that is reflected or refracted from the distorting reflective material. The distorting reflective material 32 behaves similar to a prism in that it distorts whatever is viewed through it. A mirror 31 is mounted to planar end 29 in cavity 30.

[0036] A light source 34 is mounted on base 28 in cavity 30. Light source 34 can be almost any source of light. Light source 34 preferably is a matrix of light emitting diodes (LED) 36. Light source 34 can also be an incandescent light, a neon light, a laser or a fluorescent light. The light emitting diodes 36 in the matrix are selected to emit light in several different wavelengths resulting in different colors of light. The light emitting diodes are commercially available from LED effects, Rancho Cordova, Calif. A controller 40 is electrically connected to the light emitting diodes by a cable or wire harness 38. Controller 40 provides the necessary voltage to cause the light emitting diodes to emit light. The controller 40 can also cause different light emitting diodes to emit light at different times. For example, a blue LED can be on for one time period, then a green LED for a second time period and then a red LED for a third time period.

[0037] A game symbol is shown mounted in cavity 50. Game symbol 50 is supported by a support post 52 that is mounted to base 29. Game symbol 50 can be almost any game symbol that would be used in a game. For example, game symbol 50 can be a coin, a playing card, a picture or a ball. Game symbol 50 can be rotated or may be fixed in place. While one game symbol 50 is shown, more may be added to cavity 30.

[0038] Controller

[0039] Turning now to FIG. 4, a schematic diagram of controller 40 is shown. Controller 40 is adapted to control the operation of the light emitting diodes. Controller 40 comprises integrated circuits U1, U2, and U3, and a 5-volt power supply 80. Integrated circuit U2 and U3 are an 8-bit shift register. U2 and U3 contain an 8-bit serial-in, parallel-out shift register that feeds an 8-bit D-type storage register. Integrated circuit U1 is a 4-bit microcontroller. Integrated circuits U2 and U3 are connected to the matrix 34 of LEDs 36. Resistors R4-R19 are connected between each row of the LEDs and 24 volts DC. The microcontroller U1 is programmed to turn on rows of LEDs 36 in a predetermined sequence for a predetermined period of time. Controller 40 can be chained together to control more matrices 34 of LEDs using connectors P2 and P3. A connector P1 provides a connection from the microcontroller U1 to power, ground and an external trigger. Power supply 80 supplies a 5-volt source of power to integrated circuits U1, U2 and U3.

[0040] Controller 40 provides the necessary voltage to cause the light emitting diodes to emit light. Controller 40 also allows different color LEDs to emit light at different times.

[0041] Operation

[0042] The purpose of display device 20 is to attract and entertain players. When display device 20 is lighted, it produces a vivid display that attracts the attention of people nearby and provides an exciting display for players playing gaming device 15. Light source 34 transmits an incident ray
of light 70 that impinges upon distorting reflective material 32. Ray 70 is distorted and refracted by materials 32 as a refracted ray of light 72. Refracted ray of light 72 can travel through cavity 30 and transparent portion 26 where is it viewed by game player 60. Light source 34 can also produce rays of light that travel toward other objects. For example, incident rays of light may travel to mirror 31 where they are reflected toward player 60 or toward distorting reflective material 32. Incident rays of light may travel from LED 36 to game symbol 50 where they are reflected toward player 60 or toward distorting reflective material 32 or toward mirror 31. Similarly, Incident rays of light may travel from LED 36 directly toward game player 60.

[0043] Conclusion

[0044] It can now be seen that the present invention solves many of the problems associated with the prior art. The present invention provides a lighted display device that is attractive and entertaining for use with a primary game or a bonus game. The present invention provides a display device that utilizes a distorting reflective material to reflect and refract light in a manner that is visually appealing and unusual. The present invention provides a display device that creates light displays and images that attract attention to a gaming machine such as a slot machine. Although the description above contains many specifications, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention. Thus, the scope of the invention should be determined by the appended claims and their legal equivalents rather than by the examples given.

What is claimed is:

1. A display device configured to be used with a gaming device, the display device comprising:
   (a) a container, the container having a wall defining a cavity, at least a portion of the wall being partially transparent, wherein a player may view a portion of the cavity of the container;
   (b) a plurality of light emitting diodes mounted in the cavity, the light emitting diodes being adapted to emit light;
   (c) a distorting reflective material mounted in the cavity, the distorting reflective material adapted to distort light reflected from the distorting reflective material; and
   (d) a controller in communication with the light emitting diodes, the controller being configured to cause the light emitting diodes to emit light, wherein at least a portion of the light emitted by the light emitting diodes is incident upon the reflective material and is distorted and reflected toward the player.

2. The display device of claim 1 wherein the light emitting diodes are configured to emit light in a plurality of wavelengths.

3. The display device of claim 1 wherein the plurality of light emitting diodes comprises at least a first and second light emitting diode, wherein the controller is configured to cause the first light emitting diode of the plurality of light emitting diodes to emit light at a different time than the second light emitting diode of the plurality of light emitting diodes.

4. The display device of claim 3 wherein the first light emitting diode of the plurality of light emitting diodes is configured to emit light in a different wavelength than the second light emitting diode of the plurality of light emitting diodes.

5. The display device of claim 1 further comprising a mirror mounted adjacent to the cavity, wherein at least a portion of the light emitted by the light emitting diodes is incident upon the mirror.

6. The display device of claim 1 wherein the distorting reflective material is positioned on at least a portion of an inner circumference of the cavity.

7. The display device of claim 1 wherein the distorting reflective material is attached to the wall.

8. The display device of claim 5 wherein the mirror is mounted to the wall.

9. The display device of claim 1 wherein the container is substantially cylindrical having a curved surface and at least one substantially planar end, wherein the reflective material is positioned on at least a portion of the curved surface.

10. The display device of claim 9 further comprising a mirror on at least a portion of the end.

11. The display device of claim 1 wherein the distorting reflective material distorts light similar to a prism.

12. The display device of claim 9 wherein the distorting reflective material comprises a surface holographic embossed polyester film.

13. The display device of claim 1 wherein the display device is mounted to a slot machine.

14. A display device configured to be used with gaming devices, the display device comprising:

   (a) a wall, the wall defining a cavity and having at least a partially transparent portion, wherein a player can view light emitted from within the cavity;
   (b) a light source mounted in the cavity, the light source being adapted to emit light; and
   (c) a distorting reflective material mounted in the cavity, wherein light reflected by the distorting reflective material is different than light incident on the reflective material.

15. The display device of claim 14 wherein the light source is a light emitting diode.

16. The display device of claim 14 wherein the light source is an incandescent light.

17. The display device of claim 14 wherein the light source is a fluorescent light.

18. The display device of claim 14 wherein the light source is a neon light.

19. The display device of claim 14 wherein the light source is a laser.

20. The display device of claim 14 further comprising a controller in communication with the light source, the controller being configured to cause the light source to emit light.

21. The display device of claim 14 wherein the light source is adapted to emit light in predetermined intervals.

22. The display device of claim 14 further comprising a mirror mounted adjacent to the cavity, wherein at least a portion of the emitted light is incident upon the mirror.

23. The display device of claim 14 wherein the distorting reflective material is positioned on at least a portion of an inner circumference of the cavity.
24. The display device of claim 14 wherein the distorting reflective material is mounted to the wall.

25. The display device of claim 22 wherein the mirror is mounted to the wall.

26. The display device of claim 14 wherein the container is substantially cylindrical having a curved surface and at least one substantially planar end, wherein the reflective material is positioned on at least a portion of the curved surface.

27. The display device of claim 26 further comprising a mirror on at least a portion of the end.

28. The display device of claim 14 wherein the distorting reflective material distorts light similar to a prism.

29. The display device of claim 14 wherein the distorting reflective material comprises a surface holographic embossed polyester film.

30. The display device of claim 14 wherein the display device is mounted to a slot machine.

31. The display device of claim 14 wherein the light source is a plurality of light emitting diodes that are mounted in the cavity.

32. The display device of claim 31 wherein the plurality of light emitting diodes are mounted to a base.

33. The display device of claim 31 wherein the plurality of light emitting diodes comprises a first and second light emitting diode, wherein a controller is configured to cause the first light emitting diode to emit light at a different time than the second light emitting diode.

34. The display device of claim 31 wherein the first light emitting diode is configured to emit light in a different wavelength than the second light emitting diode.

35. The display device of claim 14 wherein at least one game symbol is positioned within the cavity.

36. The display device of claim 31 wherein light from the light emitting diode is incident upon the game symbol and is reflected by the game symbol.

37. The display device of claim 31 wherein light reflected from the distorting reflective material is incident upon the game symbol and is reflected by the game symbol.

38. The display device of claim 31 wherein light reflected from a mirror is incident upon the game symbol and is reflected by the game symbol.

39. The display device of claim 31 wherein the game symbol is rotated.

40. A method of illuminating a gaming device comprising:
   (a) providing a container having a cavity, the container being partially transparent, wherein a player may view a portion of the cavity of the container;
   (b) providing a plurality of light emitting diodes mounted in the cavity;
   (c) providing a distorting reflective material mounted in the cavity;
   (d) emitting light from the light emitting diodes, a portion of the emitted light being incident upon the distorting reflective material; and
   (e) refracting the light that is incident upon the reflective material toward the player such that the player views light that has been distorted.

41. The method of claim 40 wherein the light emitting diodes emit light in a plurality of wavelengths.

42. The method of claim 40, further comprising turning the light emitting diodes on and off.

43. The method of claim 40, further comprising transmitting the light from the light emitting diodes onto a mirror.

44. The method of claim 40 wherein the distorting reflective material comprises a surface holographic embossed polyester film.

45. The method of claim 40 wherein at least one game symbol is positioned within the cavity.

46. The method of claim 45, further comprising transmitting the light from the light emitting diodes onto the game symbol and reflecting from the game symbol.

47. The method of claim 40 further comprising the reflected light from the reflective material being incident upon the game symbol and reflecting from the game symbol.

48. The method of claim 43, further comprising the reflected light from the mirror being incident upon the game symbol and reflecting from the game symbol.