

GAMING MACHINE WITH REEL STRIPS HAVING AN ORGANIC LIGHT EMITTING DIODE DISPLAY

SUMMARY

FIELD OF THE INVENTION

[0001] This invention relates to gaming machines, sometimes referred to as slot machines, and, in particular, to a light emitting diode display in a reel-type gaming machine.

BACKGROUND

[0002] Organic light emitting diode (OLED) displays are commercially available. An OLED display is a full-color flat-panel display with a level of brightness, wide viewing angle, and sharpness not possible with traditional flat-panel displays. OLEDs are self-luminous, in contrast to liquid crystal displays, and have a distinctly different look. The benefits of OLED displays over LCDs include an unlimited viewing angle, very high contrast, and much higher speed responses. They are extremely thin and lightweight, making them well suited for portable and flexible applications. Some of the many descriptions of OLED displays include U.S. Pat. Nos. 5,844,363; 5,952,789; 6,097,147; and 6,483,236; all incorporated herein by reference.

[0003] Conventional reel-type gaming machines include three or more motor-driven reels, each reel having a flexible reel strip around its periphery with 20-25 symbols printed on each reel strip. The reel strips are easily replaceable with ones having different symbols thereon. In a conventional gaming machine, a random outcome is first determined by a microprocessor using a random number generator, and pulses are applied to the stepper motor rotating each reel to cause each reel to stop at the predetermined position. The position of each rotating reel is determined by counting the number of pulses to the stepper motor after a reference position or detecting codes on the reel itself. The symbol combinations across activated pay lines are then evaluated (based upon the stopped positions of the reels), and the appropriate award is granted to the player in the form of coins or credits.

[0004] Reel-type gaming machines are the most popular type of gaming machines, well surpassing the popularity of video-type gaming machines that simulate the rotation of reels on a flat display screen. Manufacturers of gaming machines have added various features to their reel-type gaming machines to increase player interest in the gaming machines.

[0005] A reel-type gaming machine is described in U.S. Patent Application Publication U.S. 2003/0060269 A1, filed Sep. 27, 2001, incorporated herein by reference. That application describes a reel-type slot machine, where each reel strip is a flexible OLED display so that each of the symbols is represented by a pattern of energized LEDs on a reel strip. The main purpose of using the OLED reel strip is for changing the symbols for different games with no physical changes to the machine. Once a game starts, the symbols are fixed in position on the rotating reels. The device disclosed in the Publication U.S. 2003/0060269 A1 would be difficult and expensive to implement due to the rotating large electronic display.

[0006] What is needed is a further improvement to reel-type gaming machines that can reduce the cost of the machine and add player excitement.

[0007] An OLED display is used in a reel-type gaming machine. In one embodiment, only a section of a reel strip is replaced by an OLED display. The section may only display one symbol. The OLED symbol may be a special symbol used in a high value symbol combination. The symbol may dynamically change to any other image during the game itself or may provide, for example, a celebration display or a highlighted image if the symbol is used in a winning combination. Accordingly, the OLED display adds uniqueness and excitement to the gaming machine with little additional complexity and cost.

[0008] In another embodiment, at least a visible portion of a reel's circumference is provided with an OLED display, and the reels do not move. The LEDs on the OLED display are energized in such a way (scrolled) as to simulate the movement of symbols on a reel rotated by a motor. Such a gaming machine is a hybrid between a pure video gaming machine and a motor-driven reel-type machine. The reels appear to a player to be actual motor-driven reels, and the electronic control of the LEDs to simulate the rotation may be indistinguishable from actual reel rotation. The gaming machine may be manufactured inexpensively since there is no requirement for stepper motors and the controls for operating the stepper motors. Simulated sounds may be generated to simulate the sounds of reels starting and stopping.

[0009] In one embodiment, conventional rotating reels, or any reel incorporating an OLED, are viewable behind a transparent display window. The display window is a transparent electronic display that can be controlled to display any opaque or translucent image. In one embodiment, the display window is a liquid crystal display (LCD). The LCD may also be a touch screen, and icons may be displayed superimposed in front of the reel symbols so that players can effectively touch the symbols on the reels to perform certain functions. Such functions may be to hold a reel (or an OLED symbol) during the next game. The display window may be used to highlight any winning combinations of symbols on the reels or convey any other information. The LCD may provide a celebration type of screen, and may even provide the controls for the player to operate a game, such as spin the reels, bet max, etc.

[0010] In another embodiment, the display window is a transparent touch screen but cannot display images.

[0011] In another embodiment, the display glass in areas other than the transparent openings for viewing the reels may be an OLED display, and LCD, or other type of display to enable the display glass to display any programmed images.

[0012] Many other embodiments may be made using the above-identified inventions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] **FIG. 1** is a front view of a reel-type gaming machine that may incorporate the present invention.

[0014] **FIG. 2** is a perspective view of three motor-driven reels in the gaming machine of **FIG. 1**, wherein one or more symbols on a reel strip around each reel is created by an OLED display.