exciting new possibilities to the art of gaming machines. The present invention is directed to incorporating these display technologies into a gaming machine to create a visually stunning environment which attracts frequent game play. These display technologies broadly fall into one of two categories.

[0044] The first category will be referred to as the persistence-of-vision ("POV") category. Persistence of vision relies on a "trick" by the human brain which actually retains an image for a fraction of a second longer than the eye actually sees it. By the time the brain loses its retention of the image, the next image is already being seen by the eye. Motion pictures rely on this phenomenon to create a seemingly continuous animation of images by rapidly projecting images 24 times per second onto a screen. In the brief moment of time between flashing images, the brain still retains the image the eye just saw, and no "flicker" effect is perceived. Displays in the POV category include volumetric 3D displays, 360-degree displays, and displays employing a rapidly moving structure such as a wand, hoop, or fan to create a POV effect.

[0045] In a volumetric 3D display, images are flashed rapidly onto a projection screen which is spinning around an axis. A circular projection screen can fill a spherical volume, and thus an image can be made to appear at any point within the volume.

[0046] A 360-degree display includes columns of spaced-apart display elements mounted about the surface of a cylinder which spins about an axis. By selectively turning these display elements on and off as the cylinder is spinning, a POV effect is created whereby an image is perceived to appear to the viewer around the entire surface of the display even though at any given instant of time, the actual image being seen by the eye resembles columns of changing Braille patterns.

[0047] A display employing a rapidly moving structure is distinct from a volumetric display in that display elements such as LEDs are mounted onto the rapidly moving structure itself and are selectively illuminated to create a POV effect. By contrast, in a volumetric display, images are projected onto the moving element to create the POV effect. The rapidly moving structure may be a wand or rod, a hoop, a fan, or a disc, to name a few.

[0048] The second category will be referred to as the 3D category. A 3D display may display images in true 3D or in virtual or stereoscopic 3D. True 3D displays actually display imagery in a volume or three-dimensional space. Each picture or display element in the 3D imagery is called a "voxel" which is the analog of a pixel in 2D imagery. Several types of displays may be characterized as true 3D displays. The volumetric 3D display mentioned above is one such display. The spinning screen fills a volume which is defined by voxels. Another true 3D display is a multi-layer video display which includes a number of transparent liquid crystal layers sandwiched together, each layer capable of displaying imagery across its surface. The sandwiched layers add a depth dimension, and imagery can be displayed in any location in the volume defined by the multiple layers. A third type of true 3D display is a holographic display which displays 3D imagery that appears to "float" in space.

[0049] Virtual or stereoscopic 3D displays do not actually display imagery in a volume or in a 3D space, but to the viewer, the imagery nonetheless is perceived to be 3D. Autostereoscopic displays create a virtual 3D effect without the need for special eyewear to complete the 3D effect, unlike non-autostereoscopic displays, which do require special eyewear. Examples of autostereoscopic displays include lenticular displays which are a type of parallax display and have cylindrical or spherical lenslets spaced over a liquid crystal layer. Parallax displays including lenticular displays rely on the different viewing angles of the right and left eyes, referred to as binocular disparity, to create a parallax effect. In lenticular displays, interleaved images are displayed by the liquid crystal layer and are emitted through the shaped lenslets so that the right and left eyes see slightly different 2D images. These 2D images are fused in the brain to form the 3D impression.

[0050] Another autostereoscopic display referred to herein as a parallax illumination display also exploits binocular disparity to display two slightly different 2D images which are perceived separately by the right and left eyes. A liquid crystal layer is placed in front of an illumination plate from which a group of bright, uniformly spaced vertical light lines are emitted. The right eye sees the light lines through the even columns of the liquid crystal layer, and the left eye sees the light lines through the odd columns, or vice versa.

[0051] It should be emphasized that the term "3D display" as used herein does not encompass traditional 2D displays such as LCD and CRT video displays that merely simulate 3D imagery through software. These traditional displays do not create a virtual 3D effect in that they do not rely on stereoscopic or autostereoscopic methodologies to create the visual perception of depth.

[0052] The gaming machines described next in varying and different embodiments utilize one or more of any combination of the foregoing types of displays. It is understood that the present invention is not limited to the specific displays mentioned herein, but rather encompasses any display which creates a POV effect or displays true or virtual 3D imagery.

I. Control System

[0053] Referring now to the drawings, and initially to **FIG. 1**, there is shown a functional block diagram of a control system **100** suitable for operating a gaming machine. Money/credit detector **118** signals a central processing unit ("CPU") **104** when a player has inserted money or played a number of credits. The money may be provided in the form of coins, bills, tickets, coupons, cards, etc. Then, the CPU **104** operates to execute a wagering game program that causes the display **110** to display imagery such as simulated symbol-bearing reels. The player may select a number of pay lines to play, an amount to wager, and start game play via a touch screen (not shown), input keys **122**, or a switch **120**, causing the CPU **104** to set the reels in motion, randomly select a game outcome, and then stop the reels to display symbols corresponding to the pre-selected game outcome. The wagering game may be slots, poker, keno, bingo, blackjack, or roulette, for example.

[0054] A video controller **108** coupled between the display **110** and the CPU **104** controls the imagery displayed on the display **110**. The video controller **108** may be incorporated into either the display **110** or the CPU **104** or may be