

SINGLE PLANE SPANNING MODE ACROSS INDEPENDENTLY DRIVEN DISPLAYS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority under 35 U.S.C. §119(e) to U.S. Provisional Patent Application No. 60/858,741, filed on Nov. 13, 2006 entitled "MULTIPLE LAYER DISPLAYS AND THEIR USE IN GAMING MACHINES", and U.S. Provisional Patent Application No. 60/986,995, filed on Nov. 9, 2007 entitled "SINGLE PLANE SPANNING MODE ACROSS INDEPENDENTLY DRIVEN DISPLAYS", both of which are incorporated by reference for all purposes.

TECHNICAL FIELD

[0002] The present invention relates generally to processor-based devices having multi-layer displays and more specifically the presentation of images displayed on each screen of a multi-layer display device.

BACKGROUND

[0003] Display technologies have progressed at a rapid rate in recent years, with the advent of plasma displays, flat panel displays, three-dimensional ("3-D") simulating displays and the like. Such advanced displays can be used for televisions, monitors, and various other electronics and processor-based devices. Processor-based gaming machines adapted to administer a wager-based game are but one particular example of the kind of specialized electronic devices that can benefit from the use of such new and improved display technologies.

[0004] Recent advances in such display technologies include the development of displays having multiple layers of screens that are "stacked" or otherwise placed in front or back of each other to provide an overall improved visual presentation on a single combined display unit. Examples of such multi-layer displays include those that are commercially available from PureDepth, Inc. of Redwood City, Calif. The PureDepth technology incorporates two or more liquid crystal display ("LCD") screens into one physically combined display unit, where each LCD screen is separately addressable to provide separate or coordinated images between the LCD screens. Many of the PureDepth display systems include a high-brightened backlight, a rear image panel, such as an active matrix color LCD, a diffuser, a refractor, and a front image plane, which devices are laminated to form a device "stack."

[0005] The basic nature of a multi-layer display using stacked screens strongly encourages at least some form of coordination between the various images on the multiple screens. While various images on each separate screen might be clear and comprehensible if each screen were used separately in a traditional single screen display format, independent, uncoordinated, and unsynchronized images and/or text on these screens when stacked together can result in an unintelligible mess to a viewer. Such independent and uncoordinated images and/or text tend to obscure or completely block

each other in numerous locations, making the combined visual presentation dark and largely unreadable.

SUMMARY

[0006] The invention relates to multi-layer display devices and provides for the presentation of images to be displayed on each screen or other display of a multi-layer display device using one combined in-plane video image. This allows a single video card, processor, or other logic device to be used with the combined in-plane video image for a multi-layer display device without requiring the images to be synchronized or coordinated due to the use of multiple video cards, processors, or logic devices.

[0007] In one embodiment, a multi-layer display device may have a first display screen having a first resolution and adapted to present a first visual image thereon, a second display screen having a second resolution and adapted to present a second visual image thereon, the second display screen arranged relative to the first display screen such that a common line of sight passes through a portion of the first display screen to a portion of the second display screen, and a logic device configured to communicate with the first display screen and the second display screen and configured to receive a combined single visual image for display on the first and second display screens, the combined visual image having a first portion corresponding to the first visual image to be displayed on the first display screen and a second portion corresponding to the second visual image to be displayed on the second display screen, wherein the logic device is configured to transmit the first visual image to the first display screen and the second visual image to the second display screen.

[0008] In another embodiment, a method for presenting images in a multi-layer display device having a first display screen and a second display screen may comprise creating a combined single plane image, the single plane image having a first image portion corresponding to images to be displayed on the first display screen and a second image portion corresponding to images to be displayed on the second display screen, transmitting the first image portion to the first display screen, and transmitting the second image portion to the second display screen.

[0009] Other methods, features and advantages of the invention will be or will become apparent to one with skill in the art upon examination of the following figures and detailed description. It is intended that all such additional methods, features and advantages be included within this description, be within the scope of the invention, and be protected by the accompanying claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The accompanying drawings, which are incorporated into and constitute a part of this specification, illustrate one or more example embodiments and, together with the description of example embodiments, serve to explain the principles and implementations.

[0011] FIG. 1A illustrates in partial perspective and cut-away view an exemplary device having a multi-layer display with two display screens.

[0012] FIG. 1B illustrates in partial perspective and cut-away view an exemplary wager-based gaming machine having a multi-layer display with three display screens.