

character width to make a new width that is applied to each character when non-proportional spacing is enabled. GetProportionalSpacing may be used to get the current character proportional spacing method. SetProportionalSpacing may be used to enable or disable the character proportional spacing method. Next some examples of 3-D text rendering using the methods described with respect to FIGS. 4A-7 are discussed.

[0194] FIGS. 8A and 8B are diagrams of 3-D text objects rendered to a display screen of a gaming machine. As described above, displaying text in the gaming machine may require the developer to create a 3-D text object and specify text properties for that object. These properties can be assigned through several different mechanisms: API functions, scripts and models. Any combination of these mechanisms may be used at any time to create, control and specify text properties for the 3-D text object. The 3-D text object may be used in game outcome presentations, bonus game presentations, maintenance and set-up menus as well as any other function of the gaming machine that requires text to be displayed to one of the display screens on the gaming machine.

[0195] To display text on the gaming machine, a 3-D text object, such as 562 or 552, may be created. A logical unit, referred to as ActorText, may be used to create the 3-D text object. ActorText may be used for creating formatted text in real time on the gaming machine using the 3-D graphical rendering system of the gaming machine or gaming device in which is executed. It may have the capability to generate the information needed to display text by using font, specified developer properties and type settings rules. The information displayed using ActorText may be in the context of an activity presented on the gaming machine, such as a game of chance. Thus, other 3-D objects, such as 556, presented as part of a specific activity may also be rendered to the video display 34 with the rendered text.

[0196] In one embodiment, the developer may have to specify at least three properties before gaming information, defined by a 3-D text object, may be displayed. The first property that is specified may be the text page that results in a display region, such as 554 or 560. When the text page is rendered in the 3-D graphical system, a 2-D display region, such as 554, 560, 574 or 576, corresponding to the text page is displayed on the video display 34. The text page may specify the size and shape of a 3-D surface that is to be filled in with text or used as a guide for text. In the case of 3-D fonts, the surface of the text page may act as a guide for the base of the fonts. As examples, the text page may be a simple planar rectangle, a planar complex polygon or a 3-D surface. The edges of the text page can be curves defined by B-splines, Bezier curves or multiple line segments.

[0197] The position or shape of the text page can change as a function of time. For instance, the text page may be modeled as a flag that is flapping in the breeze, 576, with text written on the surface of the flag. As another example, the text page may be a globe 574 that is rotating 578 with text written on the surface of the globe. In yet another example, the text page may be modeled as the surface of a pond with ripples.

[0198] In the present invention, a designer may be able to add textures to the text page as a background. For instance, a flame texture that changes as a function of time may be

added to the text page corresponding to the rectangular display region 554. The flame texture may provide an appearance that the "Total Credit" and "2, 356" text strings are located in flames. Thus, the textures of the present invention may overlay one another with the texture the text string overlaying the texture applied to the text page, such as the flames.

[0199] With the text page specified, ActorText may have the capability to warp the text characters to follow and fit to the shape of the text page. For example, the characters in text object 562 in FIG. 8A follow the boundaries of the text page rendered as display region 560. The text page may be compared to as a sheet of paper similar to that of most word processors in that it is an area that text characters are typeset using formatting rules. However, unlike a word processor, the text page of the present invention can be a complex 3-D shape, for example a bent and twisted piece of paper. Further, the position and orientation of the text page may be manipulated in the 3-D gaming environment to change the shape of the display region that is rendered to the display screen.

[0200] It is noted that the word processor is used for explanation purposes only in that it provides a convenient analogy. Although the present invention performs functions that are similar to a word processor, the present invention is not limited to the capabilities of a word process. For instance, the present invention has the ability to generate and manipulate decorative fonts in manners that are very limited or not possible with a conventional word processor.

[0201] The shape of the text page may change as a function of time. ActorText may have the capability to warp the text characters to follow and fit to the shape of the text page as it changes as a function of time. Also, other character properties such as a color or texture of the characters in the display region may change as a function of time, which may be accounted for in 3-D text objects generated using ActorText.

[0202] The next property that may be specified for ActorText is the Font property. The Font property may be the file name and path of the font file that is used to generate the text in the 3-D text page. With the Font, ActorText can get the necessary information to place text characters inside the display region using type setting rules. The font file may include information on the placement and look of each character in the font as described with respect to FIGS. 6A-7.

[0203] Finally, the Text property may be assigned to ActorText. This property is a text string consisting of characters that are to be displayed. ActorText may take each character in the text string and generate the necessary 3-D information (vertices, faces, normals, texture UV coordinates) that describe the 3-D text object that is rendered in the 3-D gaming environment. The text string may be seen one of the displays of the gaming machine when it is rendered from a 3-D gaming environment containing the 3-D text object.

[0204] This section describes one embodiment that allows ActorText to generate 3D geometry for text characters using a 2D Textured font. It is also possible to use 3-D textured fonts with the present invention. Two examples of 3-D textured fonts 570 for the characters 'V' and 'O' are shown