

METHOD FOR CONTROLLING MOVEMENT OF VIEWING POINT OF SIMULATED CAMERA IN 3D VIDEO GAME, AND 3D VIDEO GAME MACHINE

[0001] The present invention relates to a technique for a three-dimensional (3D) video game machine including a monitor provided at a specified height position of a casing of the game machine for displaying images, a game control unit for controlling the progress of a game, and a display control unit for generating a simulated 3D image viewed from a viewing point of a simulated camera and displaying it on the monitor screen.

BACKGROUND OF THE INVENTION AND RELATED ART STATEMENT

[0002] In some of existing roll-playing fighting games for displaying a character of a game player and enemy characters and the like on a monitor screen, movements of the game player's feet are detected and the game player character on the monitor screen are so moved as to conform to the detected movements. There is also known a viewing point changing technique for displaying a simulated 3D car race image on a monitor screen provided before a game player seated on a car seat and changing a viewing point of a camera to a preset position according to the inclining movement to left or right or forward-bending movement of the upper half of the game player's body.

[0003] The latter viewing point changing technique, disclosed in Japanese Patent Publication Serial No. Hei 10-85451 for instance, is adapted to respond to the movements of the upper half of the game player's body seated on the seat, i.e. change an image when a preset viewing point is changed from a predetermined one to the another predetermined one selected from a plurality of predetermined viewing points. As the viewpoints were predetermined, the change from one to the other is carried out within the limited choices among the predetermined viewpoints. It is likely that the player can learn the pattern of changes in viewpoint so that he/she can predict the change pattern in viewpoint by playing the game several times, giving the player a monotonous feel towards viewpoint changes.

SUMMARY OF THE INVENTION

[0004] In view of the above prior art technique, an object of the present invention is to provide a method for controlling a viewing point of a simulated camera in a 3D video game which method enables images from a viewing point intended by a game player to be actively displayed by causing the viewing point of the simulated camera to follow a free movement of the game player, and to provide a video game machine.

[0005] In order to achieve the above object, a 3D video game machine according to the present invention comprises a monitor provided at a specified height position of a casing of the game machine for displaying images, a game control unit for controlling the progress of a game, a display control unit for generating a 3D image viewed from a viewing point of a simulated camera and displaying it on a screen of the monitor, head detecting means for detecting at least a position of the head of a game player located in a play area before the screen of the monitor in at least one linear direction in a 3D space, and viewing point changing means for moving the viewing point of the simulated camera to

follow a displacing direction and a displacing amount of the detected position of the head.

[0006] These and other objects, features and advantages of the present invention will become more apparent upon a reading of the following detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 is a perspective view showing one embodiment of a simulated 3D video game machine according to the present invention,

[0008] FIG. 2 is a block construction diagram of the 3D video game machine,

[0009] FIG. 3 is a diagram showing detection principle in a position calculator of a head detector,

[0010] FIGS. 4A to 4D are diagrams showing one example of a change of a viewing point of images on a monitor screen when a game player's head is vertically moved,

[0011] FIG. 5 is a diagram showing a game playing state of the game player,

[0012] FIGS. 6A to 6D are diagrams showing one example of a change of the viewing point of images on the monitor screen when the game player's head is transversely moved,

[0013] FIG. 7 is a diagram showing a game playing state of the game player,

[0014] FIG. 8 is a flow chart showing an example of a game progress processing executed by a CPU,

[0015] FIG. 9 is a flow chart showing a subroutine "Gaming Processing" executed in Step ST4,

[0016] FIG. 10 is a flow chart showing a sound processing in response to shooting from enemy characters in a subroutine "Sound Processing based on a Viewing Point" executed in Step ST18,

[0017] FIG. 11 is a perspective view showing a second embodiment of the 3D video game machine according to the present invention,

[0018] FIG. 12 is a block diagram showing detection of a game player's head in the game machine shown in FIG. 11,

[0019] FIG. 13 is a block diagram showing another embodiment of a head detector,

[0020] FIG. 14A is a block diagram showing still another embodiment of the head detector and FIG. 14B is a graph for the explanation of position determination,

[0021] FIG. 15 is a chart showing further another embodiment of the head detector, and

[0022] FIGS. 16A, 16B and 16C are diagrams showing other embodiments of a pressure-sensitive sheet members of the head detector.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

[0023] FIG. 1 is a perspective view showing one embodiment of a simulated 3D video game machine according to