An input device for computer games is provided. The input device includes an inertia sensor for sensing the movement of the input device, at least one trigger button, and a signal processor for formatting signals output from the inertia sensor and the at least one trigger button and transmitting the formatted signals to a computer.
BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to an input device, and more particularly, to an input device that is used for computer games and includes an inertia sensor. The present application is based on Korean Application No. 2001-44589 filed Jul. 24, 2001, the contents of which are incorporated herein by reference.

[0003] 2. Description of the Related Art

[0004] A mouse, a joystick, and a keyboard are widely used input devices for computer games. Specifically, a mouse and a joystick are used to move a particular object or a background picture displayed on a screen. A keyboard is mostly used to input text information; however, in some cases, it can be used to move an object or a background picture on a screen using its arrow keys.

[0005] However, some computer games, such as a shooting game, a flight simulator, or a car racing game cannot give the same realistic amusement as an amusement room with only the above input devices. In the case of a flight simulator, a joystick is generally used as an input device. The joystick can change only a background image in a state where a pointer for indicating the target to be shot is always positioned in the middle of a screen. Accordingly, it is difficult to use the joystick for any other purpose. In other words, it is difficult to use the joystick as a pointer or a mouse.

[0006] A pistol-type or rifle-type input device, which is widely used in an amusement room can be considered as an input device for reforming a shooting game using a computer. The pistol-type or rifle-type input device is also generally used for shooting games in game machines. A light-emitting diode is installed at the end of the barrel of the pistol-type or rifle-type input device, and an array of optical diodes is arranged on a screen. Accordingly, when the trigger of the pistol-type or rifle-type input device is pulled, the light-emitting diode transmits an optical signal toward the screen, and the optical diodes, which face the muzzle of the pistol-type or rifle-type input device, receive the optical signal.

[0007] However, in a case where the array of optical diodes is provided in a screen, the price of a computer system having optical diodes may increase considerably, and this would be too much of an economical burden for purchasers.

[0008] To solve this problem, a pistol-type input device using a light-emitting element and a light-receiving element, which are installed in the barrel and grip, respectively, of the input device, has been suggested in Korean Patent Publication No. 1999-37607. Such input device can reduce the price of a computer system and enhance the reality of games; however, it is not appropriate for a simulation game, such as 'Virtual Cop' or 'Rainbow 6', in which snipers and shooters (game characters) directly move from building to building because it is difficult for a user to play the simulation game at any position. In other words, it is difficult to apply the input device to virtual reality games, games for which the user can carry a gun, and the use of the input device is restricted.

SUMMARY OF THE INVENTION

[0009] To solve the above-described problems, it is an object of the present invention to provide an input device which does not increase considerably the price of a computer system, enhances the reality of games, and allows a user to play games while moving about.

[0010] Accordingly, to achieve the above object, there is provided an input device for computer games including an inertia sensor for sensing the movement of the input device, at least one trigger button, and a signal processor for formatting signals output from the inertia sensor and the at least one trigger button and transmitting the formatted signals to a computer.

[0011] The inertia sensor includes a first inertia sensor for sensing the horizontal movement (acceleration) or rotation angle of the input device, and a second inertia sensor for sensing the vertical movement (acceleration) or rotation angle of the input device.

[0012] The input device may further include a motion button for determining whether or not an appropriate response corresponding to the movement of the input device and the state of the at least one trigger button being manipulated is displayed on a screen.

[0013] The trigger button serves as a left click button in a state where the motion button is off.

[0014] The input device is a pistol-type input device, which has a handle-type input device, with a handle-type input device, which has an acceleration pedal for car racing games.

[0016] All or some of the inertia sensor, the motion button, and other general buttons.

[0017] Since the input device for games according to the present invention does not need an array of optical diodes, it is possible to reduce the price of a computer system. In addition, it is possible to sense the movement of the user using an inertia sensor. Thus, it is possible for the user to play games at any position and enjoy a more realistic and lively amusement from the games.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The above objects and advantages of the present invention will become more apparent by describing in detail preferred embodiments thereof with reference to the attached drawings in which:

[0019] FIG. 1 is a block diagram illustrating the structure of an input device that is used for computer games and has an inertia sensor, according to an embodiment of the present invention;

[0020] FIG. 2 is a side view illustrating a pistol-type input device having the structure shown in FIG. 1;

[0021] FIG. 3 is a plan view illustrating a handle-type input device having the structure shown in FIG. 1; and
FIG. 4 is a perspective view illustrating a joystick-type input device having the structure shown in FIG. 1.

DETAILED DESCRIPTION OF THE INVENTION

The present invention will now be described more fully with reference to the accompanying drawings. In the drawings, the thickness of layers and regions are exaggerated for clarity.

FIG. 1 is a block diagram illustrating the structure of an input device for computer games, having inertia sensors according to an embodiment of the present invention. Referring to FIG. 1, the input device includes a signal processor 40, first and second inertia sensors 42 and 44 electrically connected to the signal processor 40, and first through third buttons 46, 48, and 50.

The first and second inertia sensors 42 and 44 sense the movement of a game player, i.e., the movement of the input device. Specifically, the first inertia sensor 42 senses the movement (acceleration) or rotation angle of the input device in a horizontal direction. The second inertia sensor 44 senses the movement (acceleration) or rotation angle of the input device in a vertical direction. Accordingly, when the input device moves toward a predetermined direction, for example, diagonally, the diagonal direction includes a horizontal component and a vertical component, and the horizontal and vertical components are sensed by the first and second inertia sensors 42 and 44, respectively. Thus, it is possible to precisely sense the movement of the input device and identify the final location of the input device.

The first button 46 acts as the left button of a mouse and also has a trigger function. In other words, the first button 46 is a trigger button which allows a predetermined signal to be sent from the input device toward a screen and corresponds to the trigger of a pistol-type input device, the acceleration pedal of a handle-type input device, or the shot button of a joystick-type input device. The second button 48 acts as the right button of a mouse and also has a reload function. The third button 50 is a motion button used when there is a need to use the input device, for example, in the case of pursuing a target object in the screen with the use of the input device or firing at the target object on the screen. When the third button 50 is not pressed, in other words, when the third button not engaged, a computer system does not respond to the movement of the input device or the user, and a picture image displayed on the screen does not change. Thus, the third button 50 can be considered as a button for determining whether or not the game shown on the screen will progress.

When the first and second inertia sensors 42 and 44 sense the movement (acceleration) or rotation angle of the input device and the first through third buttons 46, 48, and 50 are pressed, the signal processor 40 receives a predetermined signal from the first and second inertia sensors 42 and 44 and the first through third buttons 46, 48, and 50. The signal processor 40 formats the predetermined signal and transmits the formatted signal to a computer 60. Then, the computer 60 captures the movement of the input device and identifies the final position of the input device and whether each of the first through third buttons 46, 48, and 50 is in an ON state or an OFF state. Next, the computer 60 displays an appropriate response corresponding to the predetermined signal received from the signal processor 40 on the screen by combining the final position of the input device and the state of each of the first through third buttons 46, 48, and 50.

One module may be comprised of some or all of the first and second inertia sensors 42 and 44, the first through third buttons 46, 48, and 50, and the signal processor 40. Accordingly, it is possible to manufacture various types of input devices for computer games by simply installing the module in an input device.

FIG. 2 is a side view illustrating a pistol-type input device 100 as an example of an input device having the elements described above. An inertia sensor for sensing the horizontal or vertical movement (acceleration) or rotation angle of a barrel is installed at one end 110 of the barrel around the muzzle of the input device 100, and a second button 48 for reloading is installed at the other end of the barrel. Reference numeral 140 represents the trigger of the pistol-type input device 100 which is a trigger button used to fire at a target displayed on the screen. A motion button 130 is installed at a location near the thumb of a user when the user grasps the grip 150 of the input device 100. A cable 160 for electrically connecting the pistol-type input device 100 to a computer is connected to the bottom portion of the grip 150 of the pistol-type input device 100. Signals output from the signal processor (not shown), which is installed in the pistol-type input device 100, are transmitted to the computer via the cable 160.

FIG. 3 is a plan view illustrating a handle-type input device 200 having an inertia sensor and a motion button. Reference numeral 210 represents an inertia sensor for sensing the rotation, movement in every direction, and rotation angle of the handle-type input device 200. The inertia sensor 210 is installed on the pivot of the handle-type input device 200. A motion button 220 is installed at the right edge of the handle-type input device 200, and an acceleration pedal 230 is installed at the left edge of the handle-type input device 200. Reference numeral 240 represents a cable for transmitting signals output from a signal processor (not shown) installed in the handle-type input device 200 to a computer.

FIG. 4 is a perspective view illustrating a joystick-type input device 300 having an inertia sensor and a motion button. Referring to FIG. 4, an inertia sensor 330 is installed in a control lever 320, and a motion button 340 and a shoot button 350 are installed at the right and left sides, respectively, of the upper portion of the control lever 320. Buttons such as a program button 360 and a shift button 370, which are for performing basic functions of a typical joystick, are installed in a joystick body 310.

While this invention has been particularly shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims. For example, it is quite clear to those skilled in the art that it is possible to realize an input device different from a pistol-type input device, a handle-type input device, and a joystick-type input device using a module having all or some of the elements shown in FIG. 1, and the positions of the elements of the input device may be different from the positions of the corresponding elements of the input devices suggested in the embodiments of the present invention.
As described above, since the input device for games according to the present invention does not need an array of optical diodes, it is possible to reduce the price of a computer system. In addition, it is possible to sense the movement of the user using an inertia sensor. Thus, it is possible for the user to play games at any position and enjoy a more realistic and lively amusement from the games.

What is claimed is:
1. An input device for computer games comprising:
   an inertia sensor for sensing the movement of the input device;
   at least one trigger button; and
   a signal processor for formatting signals output from the inertia sensor and the at least one trigger button and transmitting the formatted signals to a computer.

2. The input device for computer games of claim 1, wherein the inertia sensor comprises:
   a first inertia sensor for sensing the horizontal movement (acceleration) or rotation angle of the input device; and
   a second inertia sensor for sensing the vertical movement (acceleration) or rotation angle of the input device.

3. The input device for computer games of claim 1 further comprising a motion button for determining whether or not an appropriate response corresponding to the movement of the input device and the state of the at least one trigger button being manipulated is displayed on a screen.

4. The input device for computer games of claim 1, wherein the input device is a pistol-type input device, a handle-type input device, which has an acceleration pedal for car racing games, or a joystick-type input device.

5. The input device for computer games of claim 1, wherein all or some of the inertia sensor, the at least one trigger button, and the signal processor constitute a module.