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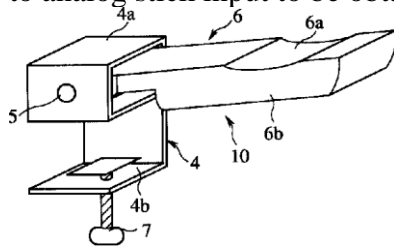
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(54) [Title of the Invention] MULTISTAGE TRIGGER DEVICE

(57) [Abstract]

[Problem] To provide a multistage trigger device that utilizes a conventional controller to enable pseudo-analog input similar to that of an analog stick without the need for practice in operating.

[Solution] A multistage trigger device 10 is provided with a controller mounting part 4 capable of gripping a steering wheel 2 from above and below, and a plate-shaped lever 6 that is hingeably mounted to an upper part 4a of the controller mounting part 4 via a hinge 5. A tightening screw 7 is attached to a lower part 4b of the controller mounting part 4. A concave curved part 6a is formed on an upper surface of the lever 6, and the rear side thereof is partially thickened to form a button-pressing part 6b so as to enable reliable pressing of trigger buttons 3. When the lever 6 is pressed, trigger buttons A, B, C therebeneath are continuously pressed, allowing a feel similar to analog stick input to be obtained.



[Claims]

[Claim 1]

A multistage trigger device for mounting on a controller provided with a plurality of trigger buttons, the device being characterized in comprising a controller mounting part capable of being mounted on a part of the controller near the plurality of trigger buttons, and a trigger button pressing means that is capable of moving relative to the controller mounting part, and is capable, through said movement, of pressing the plurality of trigger buttons of the controller in at least two manners.

[Claim 2]

The multistage trigger device according to claim 1, wherein a plurality of trigger button rows each constituted by a plurality of trigger buttons is provided on the controller, and the trigger button pressing means is provided for each of the plurality of trigger button rows.

[Claim 3]

The multistage trigger device according to claim 1 or 2, wherein the trigger button pressing means is a lever that is hingeably mounted on the controller mounting part, and is capable of moving in a direction so as to press the plurality of trigger buttons.

[Claim 4]

The multistage trigger device according to claim 1 or 2, wherein the trigger button pressing means is a slide knob that is attached the controller mounting part, and is capable of sliding in a direction along which the plurality of trigger buttons is arranged.

[Claim 5]

The multistage trigger device according to claim 4, further comprising a biasing means that urges the slide knob back to an initial position.

[Detailed Description of the Invention]

[0001]

[Field of the invention]

The present invention relates to a multistage trigger device that is mounted on, for example, a video game controller, and, in particular, to a multistage trigger device that is mounted on a controller provided with a plurality of trigger buttons and is capable of expanding the functions thereof.

[0002]

[Prior art]

With the recent spread of home video game devices, game software has tended to become increasingly complex and diverse, and video game devices that utilize so-called analog controllers, which are controllers capable not only of simply turning trigger buttons on and off, but also of analog signal input, have appeared.

[0003]

However, analog controllers are not only more expensive than typical “digital” controllers, which only allow for trigger button on/off input, but also require complex processing on the part of the game software in order to allow for use with other game software. Therefore, attempts have been made to realize multiple input patterns (pseudo-analog input) using the existing trigger buttons of conventional digital controllers. For example, in a fighting game, three trigger buttons each for weak, medium, and strong may be assigned to the punches and kicks thrown by a character, or two trigger buttons each for weak and medium may be assigned to slashing and kicking actions, wherein, in addition to the buttons being pressed one at a time, the weak and medium buttons can be pressed simultaneously to yield a stronger attack.

[0004]

[Problem to be solved by the invention]

Of the controller operation schemes described above, the former, in which separate trigger buttons are assigned to a plurality of inputs, assigns one action to one trigger button as a rule, and thus can be considered an operation method that is intuitive for players and comparatively well-suited for action games such as fighting games. However, such action games do not inherently require analog controllers; thus, when attempting to play games that require an analog controller, such as car racing games in which vehicle speed is variable, or shooting games in which a variable number of shots can be fired per unit of time, using such an operation scheme, a trigger button is needed for the variable element, with the result that such controllers cannot be used as is.

[0005]

The latter operation scheme, in which a separate function is assigned to the simultaneous pressing of multiple buttons, enables more actions than the number of buttons, but requires players to both individually operate two trigger buttons and to operate the buttons simultaneously, which requires practice. An object of the present invention is to provide a multistage trigger device that utilizes a conventional controller to enable pseudo-analog input similar to that of an analog stick without the need for practice in operating.

[0006]

[Means for solving the problem]

The object proposed above is achieved through a multistage trigger device for mounting on a controller provided with a plurality of trigger buttons, the device being characterized in comprising a controller mounting part capable of being mounted on a part of the controller near the plurality of trigger buttons, and a trigger button pressing means that is capable of moving relative to the controller mounting part, and is capable, through said movement, of pressing the plurality of trigger buttons of the controller in at least two manners.

[0007]

In the multistage trigger device described above, it is preferable that a plurality of trigger button rows each constituted by a plurality of trigger buttons be provided on the controller, and the trigger button pressing means be provided for each of the plurality of trigger button rows. In the multistage trigger device described above, it is preferable that the trigger button pressing means be a lever that is hingeably mounted on the controller mounting part, and is capable of moving in a direction so as to press the plurality of trigger buttons. This enables a plurality of trigger buttons to be pressed by means of the simple act of moving the lever up and down, allowing for input similar to that of an analog stick.

[0008]

In the multistage trigger device described above, it is preferable that the trigger button pressing means be a slide knob that is attached the controller mounting part, and is capable of sliding in a direction along which the plurality of trigger buttons is arranged. This enables a plurality of trigger buttons to be pressed by means of the simple act of sliding the slide knob, allowing for input similar to that of an analog stick.

[0009]

It is preferable that the multistage trigger device described above further comprise a biasing means that urges the slide knob back to an initial position.

[0010]

[Embodiments of the invention]

A multistage trigger device according to a first embodiment of the present invention will be described with reference to FIGS. 1–3. Before describing the multistage trigger device according to the present embodiment, the structure of a specific example of a home video game device controller on which the multistage trigger device is mounted will be described.

[0011]

FIG. 1 is an exterior view of a racing game controller that is connected to a video game device body (not shown) and is operated by a player. In FIG. 1, a controller 1 is provided with a butterfly-shaped steering wheel 2 capable of producing analog input according to its rotational position, provided with a total of six trigger buttons 3 capable of being pressed by a player's finger, usually the thumb, near grip parts 2a thereof. The trigger buttons 3 control specific signals that are turned on and off by being pressed and released by the player, and provide digital input.

[0012]

In the description of the present application, the letters shown in the drawings (A, B, C, X, Y, Z) are used to indicate specific buttons out of the six trigger buttons 3. In accordance with the present embodiment, the multistage trigger device shown in FIG. 2 is prepared for this steering wheel controller 1, and is mounted on the portions of the steering wheel indicated by dotted lines in FIG. 1. FIG. 2 is an exterior view of a multistage trigger device according to the present embodiment.

[0013]

A multistage trigger device 10 is provided with a controller mounting part 4 capable of gripping the steering wheel 2 from above and below, and a plate-shaped lever 6 that is hingeably mounted to an upper part 4a of the controller mounting part 4 via a hinge 5. A tightening screw 7 for firmly anchoring the controller mounting part 4 to the steering wheel 2 after the former has gripped the steering wheel 2 is attached to a lower part 4b of the controller mounting part 4.

[0014]

A concave curved part 6a is formed on an upper surface of the lever 6 so as to conform to the player's finger, and the rear side thereof is partially thickened to form a button-pressing part 6b so as to enable reliable pressing of the trigger buttons 3. FIG. 3 is a side exterior view of the multistage trigger device 10 mounted to the part of the steering wheel at which trigger buttons A, B, C are disposed. Signal input patterns based on the manner in which the lever is operated will now be described with reference to FIG. 3.

[0015]

When a player depresses the lever 6 toward the steering wheel (in the direction indicated by arrow D) with the controller mounting part 4 of the multistage trigger device 10 anchored to the steering wheel 2 by the tightening screw 7, the tilting of the button-pressing part 6b of the lever 6 causes the trigger buttons 3 labeled A, B, C to be gradually depressed starting from the trigger button 3 nearest the hinge 5, in the order $A \rightarrow A+B \rightarrow A+B+C$.

[0016]

As a result, the steering wheel controller 1 on which the multistage trigger device 10 is mounted allows for multistage key input via a single operation on the part of the player, instead of the key input patterns yielded by individual operation of the trigger buttons as before. Specifically, it is thus possible, in a racing game or the like, to perform delicate operation of a race car, such as half-throttle (equivalent to the accelerator pedal being only partially depressed) short of full-throttle. This enables the substantial expansion of the function of a controller 1 in which one trigger button apiece is assigned to the accelerator and the brakes. In addition, the mode of operation, i.e., operating a lever, is comparatively similar to the operation of an accelerator

pedal; thus, applying this form of key input to the accelerator of a vehicle enables the provision of a controller that is intuitive for players.

[0017]

Next, a multistage trigger device according to a second embodiment of the present invention will be described with reference to FIGS. 4 and 5. FIG. 4 is an exterior view of a multistage trigger device, and FIG. 5 is an illustration for describing the mounting and operation thereof. Elements identical or similar to those of the multistage trigger device shown in FIGS. 2 and 3 will be identically labeled, and description thereof will be omitted or shortened. In the first embodiment, three-stage continuous key input using three trigger buttons 3 is possible, whereas the second embodiment enables five-stage key input using three trigger buttons 3.

[0018]

A multistage trigger device 20 according to the present embodiment is provided with a controller mounting part 11 similar to that of the previous embodiment. The controller mounting part 11 has a somewhat elongated form so as to cover the three trigger buttons 3 to be operated. A longitudinal slit 12 is formed in a top plate 11a, and a hole 13 for admitting the trigger buttons 3 is formed in a middle plate 11b. A tightening screw 7 for firmly anchoring the controller mounting part 11 to the steering wheel 2 is attached to a bottom plate 11c that is positioned to the rear of the steering wheel 2 when the device is mounted on the controller 1.

[0019]

A slide knob 14 constituting a trigger button pressing means is slidably mounted within the slit 12. The slide knob 14 comprises an operated part 14a that projects above the top plate 11a and is contacted by the player's finger, and a trigger button contacting part 14b that is integral with the operated part 14a through the slit 12 and moves along the rear side of the top plate 11a to press the trigger buttons 3. As shown in FIG. 5, the right and left contact surfaces of the trigger button contacting part 14b are chamfered so as to allow the trigger buttons 3 projecting through the middle plate 11b to be depressed straight down without resistance.

[0020]

The slide knob 14 is provided with a spring 14c that applies force so as to urge the slide knob 14 back to its original position. Thanks to the action of the spring 14c, the slide knob 14 will always return to its original position when released by the player after the slide knob 14 has been moved by the player, or even when being operated by the player. As a result, the player need only operate the knob in one direction, thereby improving ease of operation.

[0021]

Next, signal input patterns yielded by operation of the slide knob will be described with reference to FIG. 5. When the player slides the slide knob 14 toward the trigger buttons (in the direction indicated by arrow E) with the controller mounting part 11 of the multistage trigger device 20 being anchored to the steering wheel 2 by the tightening screw 7, the trigger buttons 3 designated A, B, C are pressed in the order $A \rightarrow B \rightarrow C$ through the movement of the trigger button contacting part 14b. Because the contacting part 14b is larger than the spaces between buttons A, B and buttons B, C, the contacting part 14b simultaneously presses both buttons, yielding key inputs $A+B$ and $B+C$, respectively, at these positions.

[0022]

As a result, the steering wheel controller 1 on which the multistage trigger device 20 is mounted allows for a total of five stages of key input, namely, $A \rightarrow A+B \rightarrow B \rightarrow B+C \rightarrow C$, via a single operation on the part of the player, instead of the key input patterns yielded by individual

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