

DESCRIPTION

ENTERTAINMENT DEVICE AND METHOD OF OPERATION THEREOF

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FIELD OF THE INVENTION

This invention concerns an entertainment device and an operation method of the entertainment device, in which multiple kinds of operations, for example operations of power off and reset, are done in common with the operation part of the entertainment device.

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BACKGROUND OF THE INVENTION

Heretofore in an entertainment device, if there are many individual operation parts, they each have charge of a single function, for example, turning the power on and off is done with a power switch, and the reset function is done with a reset switch, and the power switch and reset switch have been provided separately.

But in recent years, entertainment devices have been made increasingly smaller while being given more functions to perform. This has made it unavoidable to add operation units related to the new functions, despite the smaller surface area of the entertainment device main body. This has created a demand to reduce the operation units as much as possible even though main body of the entertainment device is made smaller and new functions have been added to the entertainment device.

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SUMMARY OF THE INVENTION

Thus the object of this invention is to provide an entertainment device that accepts multiple kinds of operation instructions with the same operation unit, and an operation method of such entertainment device.

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The above and other objects of the present invention are attained by an

entertainment device comprising:

an operation unit that allows operations from outside and

a decision unit that decides, concerning operations accepted by said operation

unit, the mode of operation of said operation, and

5 outputs predefined instruction signals with respect to said decided operation modes.

The entertainment device according to present invention comprises:

a main system,

an operation unit that allows operation instructions from outside,

10 a control unit that receives signals from said operation unit and controls an operation state of said main system, and

a switch that decides whether to turn the power supply to the system on or off based on instructions from said control unit, wherein

when power is being supplied to said main system,

15 said control unit decides,

based on the mode of a signal input by said operation unit, whether to output to said switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction.

In an embodiment, the entertainment device of this invention comprises:

20 a main system,

a push switch that allows operation instructions from outside,

a control unit that receives signals conveyed from said push switch and

controls an operation state of said main system, and

a power supply switch that decides whether to turn the power supply to the

25 system on or off based on instructions from said control unit, wherein

when power is being supplied to said main system,

said control unit decides,

based on the mode of a signal conveyed from said push switch, whether to output to said power supply switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction.

An operation method of an entertainment device according to this invention
5 comprises the steps of: operating an operation unit of the entertainment device from outside;

deciding receiving signals from said operation unit and controlling by a control unit of the entertainment device an a operation state of a main system of the entertainment device and whether to turn power supply to said main system on or off
10 by a switch of the entertainment system, based on instructions from said control unit, wherein

when power is being supplied to said main system by said switch being on,
based on a state of a signal input by said operation unit, it is decided whether to output to said switch a signal instructing that the power supply be turned off, or whether
15 to output to said main system a signal giving a reset instruction.

In an embodiment, the operation method of an entertainment system having a push switch, a main system, a control unit and a power supply switch, the method comprising the steps of operating the push switch;

receiving signals conveyed from said push switch and controlling by the
20 control unit an operation state of the main system;

and deciding whether to turn the power supply to said main system on or off is by the power supply switch based on instructions from said control unit, wherein

when power is being supplied to said main system by said power supply switch being on,

25 based on the state of signals conveyed by said push switch, it is decided whether to output to said power supply switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset

instruction.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of the entertainment device of the present
5 invention;

Figure 2 is a block diagram of the entertainment device of the invention;

Figure 3 is a flowchart showing an example of the power source control
procedure;

Figure 4 is a flowchart showing another example of the power source control
10 procedure;

Figure 5 is a flowchart showing still another example of the power source
control procedure; and

Figure 6 is a flowchart showing yet another example of the power source
control procedure.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following, using the drawings, the embodiments of this invention will be
described. The explanation is given by taking as an example an entertainment device
that is capable of games, video playback, audio playback, communication, etc.

20 Figure 1 shows a perspective view of the entertainment device 100 of an
embodiment. Entertainment device 100 is housed in a cabinet 110. Arranged on the
front surface of cabinet 110 are memory card insertion holes 111, controller insertion
holes 112, a retractable disk tray 113, and a push switch (hereafter also called simply
"switch") 114. Here, the user of the entertainment device 100 can operate push switch
25 114 on the front surface of cabinet 110 as an operation to the operation reception means;
specifically, he can perform a push-in operation on push switch 114.

In Figure 1, push switch 114 is used as a means for receiving operation

instructions from outside, but it is not limited to this. For example, the switch may be a touch switch or touch panel, etc.

Referring to Figure 2, the internal composition of entertainment device 100 shown in Figure 1 will be now described.

5 Figure 2 is a functional block diagram of entertainment device 100 of this embodiment. The example shown in Figure 2 is one for describing an example in which push switch 114 is shared with a power switch and a reset switch.

Entertainment device 100 shown in Figure 2 has at least a power circuit 120, a main system 130 that provides entertainment functions to the user, a push switch 114
10 that receives operation instructions from outside, a system controller 140 that controls the operation state of main system 130, and an internal switch 150 that decides whether to turn the power of main system 130 on or off.

System controller 140 has a power control unit 141 which performs power control of main system 130.

15 Push switch 114 is connected to system controller 140, and signals that indicate the operation state of push switch 114 are transmitted to system controller 140. That is, pushing grounded push switch 114 causes [the voltage of] the terminal (not shown) of system controller 140 that is connected to push switch 114 to go down to the ground level.

20 Power circuit 120 is connected to, and supplies power to, system controller 140 and, via internal switch 150, main system 130.

System controller 140 is also connected to internal switch 150 and controls turning the power to main system 130 on and off. System controller 140 is also connected to main system 130 and can send a reset signal to main system 130.

25 Referring to Figure 3, a first embodiment of the power control procedure will be described.

When push switch 114 is pressed while the power of main system 130 is off

(step 1a), system controller 140 detects the signal, a power-on signal is output to internal switch 150 by power control unit 141 (step 2a), and power is supplied to main system 130.

When push switch 114 is pressed again while power is being supplied to main system 130 (step 3a), power control unit 141 measures the time during which switch 114 is being pressed. Then it is judged whether the time during which this switch 114 continues to be pressed is long or short (step 4a). While the time during which switch 114 is continuously pressed since the beginning of the measurement remains less than a first standard time, if switch 114 is released, a reset signal is transmitted to main system 130 (step 5a). If the time during which switch 114 is pressed, exceeds the predetermined first standard time, a power-off signal for main system 130 is sent to internal switch 150 (step 6a).

In this way, a single switch is given two functions: power on/off, and reset.

In the above described embodiment, the decision between power-off and reset is made by the length of the time during which the push switch continues to be pressed, but this invention is not limited to this effect. For example, the decision may be made by the number of times the switch is pressed within a prescribed time period.

Specifically, for example, the power on signal is output (step 2b) as a measurement of the time beginning (step 1b) when the switch is first pressed as shown in Figure 4. After this, if the number of times it is pressed within the prescribed time period is once (step 3b), a reset may be done (steps 4b, 5b), and if that member is two, a power-off (steps 4b, 6b) may be done.

Also, if after reset there is no operation input to entertainment device 100 for a fixed period of time or longer, the power may be turned off. For example, the following may be done.

That is, in Figure 5, the operation is the same from step 1c to step 3c as from step 1a to step 3a in Figure 3, but if, after completion of the reset of main system 130

(step 4c), the user of entertainment device 100 makes some operation input to entertainment device 100 (step 5c), main system 130 reports the start of an entertainment function to power control unit 141 (step 6c). On the other hand, power control unit 141, after transmitting a reset signal, measures the elapsed time since when it was transmitted. And if no entertainment function start report is received from main system 130 even after a second standard time has elapsed, power control unit 141 transmits a power-off signal to internal switch 150 (step 7c). In this case, the power is turned off even if in step 4c the user intends to turn the power off but actually only did a reset, and the power is not turned off and is left as is.

Moreover, if switch 114 is repeatedly pressed, the power may be turned off if the number of times it is pressed within a fixed time period reaches a fixed number of times. This is because one can conceive of cases in which a user repeating the reset operation many times means that he is not familiar with how to use entertainment device 100, so although he wants to turn the power off, he cannot. That is, the operation steps 1d to 4d in Figure 6 are the same as steps 1c to 4c in Figure 5, but a power off signal is output to internal switch 150 (step 6d) if, after outputting a reset signal to main system 130 (step 4d), power control unit 141 outputs a reset signal a predetermined standard number of times or more within a third standard time (step 5d).

In the examples shown in Figure 2 to Figure 6 the sharing of the power switch and reset switch by push switch 114 has been described. In these embodiments, as an example of the sharing of multiple functions by a single switch, the two functions of turning the power off and resetting are shared by the push switch. In addition, rather than making a simple selection, etc. of the two functions, the two functions are controlled by providing a priority and conditions for the two functions under fixed conditions according to how the switch is operated. Therefore, in the examples of Figure 2 to Figure 6, various modification examples can be applied as necessary according to the priority and conditions of these functions.

Moreover, the object of this invention is to share multiple functions by a single switch and to control multiple functions by providing a priority and conditions for multiple functions under fixed conditions according to how a switch is operated, and application examples can exist concerning the type of switch, the number and types of functions, the priority and conditions for the functions, and many other modifications.

In this way the present invention makes it possible to provide an entertainment device that receives operation instructions of multiple kinds with the same operation unit.

CLAIMS

What is claimed is:

1. An entertainment device comprising:

5 an operation unit that receives operation instructions from outside of the entertainment device; and
a decision unit that decides, concerning operations accepted by said operation unit, a mode of operation of an accepted operation,
wherein said entertainment device outputs predetermined instruction signals
10 according to said decided operation mode.

2. An entertainment device comprising:

a main system,
an operation unit that receives operation instructions applied to said operation
15 unit by a user from outside of the entertainment device.
a control unit that receives signals from said operation unit and controls an operation state of said main system; and
a switch that decides whether to turn power supply to the main system on or off based on instructions from said control unit,
20 wherein said control unit decides, when power is being supplied to said main system, based on a mode of said signal input by said operation unit, whether to output to said switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction.

25 3. The entertainment device as described in claim 2, wherein

when said switch has been turned on based on a first operation of said operation unit, power is supplied to said main system; and

said signal input by said operation unit is determined by counting a first standard time by a second operation continuation time of said operation unit.

4. The entertainment device as described in claim 2, wherein

5 when said switch has been turned on based on a first operation of said operation unit, power is supplied to said main system; and

said signal input by said operation unit is determined by the number of times of a second operation of said operation unit.

10 5. The entertainment device as described in claim 2, wherein

when said switch has been turned on based on a first operation of said operation unit, power is supplied to said main system; and

said signal input by said operation unit is determined by existence or absence of a second operation of said operation unit and of further operation input from outside
15 in a second standard time following this second operation.

6. The entertainment device as described in claim 2, wherein

when said switch has been turned on based on a first operation of said operation unit, power is supplied to said main system; and

20 said signal input by said operation unit is determined by an initial second operation of said operation unit and a multiple number of times of the second operation in a third standard time following said second operation.

7. An entertainment device comprising,

25 a main system,

a push switch that receives operation instructions from outside;

a control unit that receives signals conveyed from said push switch and

controls an operation state of said main system, and

a power supply switch that decides whether to turn power supply to the main system on or off, based on instructions from said control unit, wherein

when power is being supplied to said main system,

5 said control unit decides,

based on a mode of signal conveyed from said push switch, whether to output to said power supply switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction.

10 8. The entertainment device as described in claim 7, wherein

when power is supplied to said main system is when said power supply switch has been turned on based on a first operation of said push switch, and

a decision of said control unit based on the mode of a signal conveyed from said push switch, whether to output to said power supply switch a signal instructing that
15 the power supply be turned off, or whether to output to said main system a signal giving a reset instruction, is obtained

if a continuation time of a second operation of said push switch is less than a first standard time, and a signal instructing that the power supply be turned off is output to said power supply switch, and if the continuation time of the second operation of said
20 push switch is greater than or equal to a first standard time, a signal giving a reset instruction is output to said main system.

9. The entertainment device as described in claim 7, wherein

when power is supplied to said main system is when said power supply switch
25 has been turned on based on a first operation of said push switch a decision of said control unit,

based on the mode of signal conveyed from said push switch, whether to output

to said power supply switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction is obtained

if the number of times of a second operation of said push switch is one time, a signal giving a reset instruction is output to said main system, and if the number of
5 times of the second operation of said push switch is two times, a signal instructing that the power supply be turned off is output to said power supply switch.

10. The entertainment device as described in claim 7, wherein

when power is supplied to said main system is when said power supply switch
10 has been turned on based on a first operation of said push switch a decision of said control unit,

based on the mode of signal conveyed from said push switch, whether to output to said power supply switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction is obtained

15 by a second operation of said push switch and a signal giving a reset instruction is output to said main system, and if there is no operation input from outside within a second standard time after a second operation of said push switch, a signal instructing that the power supply be turned off is output to said power supply switch.

20 11. The entertainment device as described in claim 10, wherein

if there is an operation input from outside within a second standard time after the second operation of said push switch, the entertainment function is begun.

12. The entertainment device as described in claim 7, wherein

25 when power is supplied to said main system is when said power supply switch has been turned on based on a first operation of said push switch a decision of said control unit,

based on the mode of signal conveyed from said push switch, whether to output to said power supply switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction is obtained

by a second operation of said push switch and a signal giving a reset instruction is output to said main system, and if there is an operation of said push switch the prescribed number of times or more within a third standard time after a second operation of said push switch, a signal instructing that the power supply be turned off is output to said power supply switch.

- 10 13. An operation method of an entertainment system including an operation unit, a control unit, a main system and a switch, the operation method comprising the steps of:
- operating the operation unit from outside of the entertainment system;
- receiving signals from said operation unit and controlling by the control unit an operation state of the main system, and deciding whether to turn power supply to said
- 15 main system on or off by the switch based on instructions from said control unit, wherein
- when power is being supplied to said main system by said switch being on,
- based on the state of said signal input by said operation unit, it is decided whether to output to said switch a signal instructing that the power supply be turned off,
- 20 or whether to output to said main system a signal giving a reset instruction for the entertainment system.

14. The operation method as described in claim 13, wherein
- when power is being supplied to said main system by said switch being on is
- 25 when said switch has been turned on based on a first operation of said operation unit, and
- a mode of said signal input by said operation unit is to count a first standard

time by the continuous time of a second operation of said operation unit.

15. The operation method as described in claim 13, wherein

when power is being supplied to said main system by said switch being on is

5 when said switch has been turned on based on a first operation of said operation unit,
and

a mode of said signal input by said operation unit is to count the number of
second operations of said operation unit.

10 16. The operation method as described in claim 13, wherein

when power is being supplied to said main system by said switch being on is

when said switch has been turned on based on a first operation of said operation unit,
and

15 a mode of said signal input by said operation unit is the existence or absence of
a second operation of said operation unit and of further operation input from outside in a
second standard time following the second operation.

17. The operation method as described in claim 13, wherein

when power is being supplied to said main system by said switch being on is

20 when said switch has been turned on based on a first operation of said operation unit,
and

a mode of said signal input by said operation unit is an initial second operation
of said operation unit and a multiple number of times of the operation in a third standard
time following this second operation.

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18. In an operation method of an entertainment device including a push switch, a
control unit, a main system, and a power supply switch, the operation method

comprising the steps of:

operating said push switch from outside of the entertainment system receiving signals conveyed from said push switch and controlling by the control unit an operation state of the main system and

5 deciding whether to turn the power supply to said main system on or off is decided by the power supply switch based on instructions from said control unit, wherein

when power is being supplied to said main system by said power supply switch being on,

10 based on the state of signals conveyed by said push switch, it is decided whether to output to said power supply switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction to the entertainment system.

15 19. The operation method as described in claim 18, wherein

when power is supplied to said main system by said power supply switch being turned on is when said power supply switch has been turned on based on a first operation of said push switch,

20 deciding, based on the mode of signal conveyed from said push switch, whether to output to said power supply switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction, is obtained

25 if the continuation time of a second operation of said push switch is less than a first standard time, and a signal instructing that the power supply be turned off is output to said power supply switch, and if the continuation time of a second operation of said push switch is greater than or equal to a first standard time, a signal giving a reset instruction is output to said main system.

20. The operation method as described in claim 18, wherein

when power is supplied to said main system by said power supply switch being turned on is when said power supply switch has been turned on based on a first

5 operation of said push switch,

deciding, based on the mode of signal conveyed from said push switch, whether to output to said power supply switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction, is obtained

10 if the number of times of a second operation of said push switch is one time, and a signal giving a reset instruction is output to said main system, and if the number of times of a second operation of said push switch is two times, a signal instructing that the power supply be turned off is output to said power supply switch.

15 21. The operation method as described in claim 18, wherein

when power is supplied to said main system by said power supply switch being turned on is when said power supply switch has been turned on based on a first operation of said push switch,

20 deciding, based on the mode of signal conveyed from said push switch, whether to output to said power supply switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction, is obtained

25 by a second operation of said push switch and a signal giving a reset instruction is output to said main system, and if there is no operation input from outside within a second standard time after a second operation of said push switch, a signal instructing that the power supply be turned off is output to said power supply switch.

22. The operation method as described in claim 21, wherein

if there is an operation input from outside within a second standard time after a second operation of said push switch, the entertainment function is begun.

5 23. The operation method as described in claim 18, wherein

when power is supplied to said main system by said power supply switch being turned on is when said power supply switch has been turned on based on a first operation of said push switch,

deciding, based on the mode of signal conveyed from said push switch,

10 whether to output to said power supply switch a signal instructing that the power supply be turned off, or whether to output to said main system a signal giving a reset instruction, is obtained

by a second operation of said push switch and a signal giving a reset instruction is output to said main system, and if there is an operation of said push switch the

15 prescribed number of times or more within a third standard time after a second operation of said push switch, a signal instructing that the power supply be turned off is output to said power supply switch.