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(54) LAUNDRY TREATING APPARATUS AND METHOD FOR CONTROLLING SAME

(57) Disclosed are a laundry treating apparatus and a method for controlling same, the laundry treating apparatus according to an embodiment of the present disclosure comprising: a cabinet; a drum which is provided within the cabinet, is rotatably provided, and accommodates laundry therein; a manipulation part which is provided in the cabinet and is manipulated by a user to generate a manipulation signal; and a screen outputter which is provided in the cabinet and outputs a screen for providing information to the user, wherein the screen outputter is provided to output a course progress screen displaying performance information on a course for treating laundry, and the manipulation part comprises a multi-function button which is activated in at least a part of a plurality of processes performed in the course and, when manipulated by the user in an activation state, a laundry additional process for additionally inputting laundry in the progress of the course is carried out.

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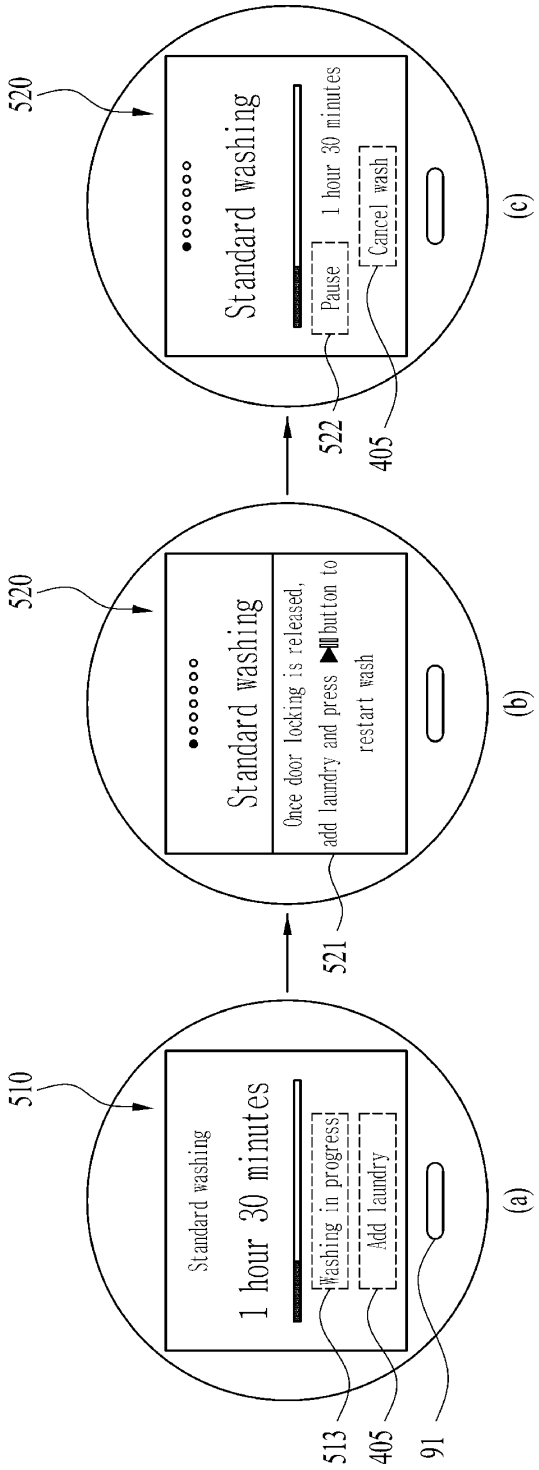
[Fig. 16]


510
Standard washing
1 hour 30 minutes
Washing in progress
Add laundry
513
405
91
(a)
520
521
Standard washing
Once door locking is released, add laundry and press ▶II button to restart wash
(b)
520
Standard washing
1 hour 30 minutes
Pause
Cancel wash
522
405
(c)

Description

[Technical Field]

[0001] The present disclosure relates to a laundry treating apparatus, and more particularly, to a laundry treating apparatus including a screen outputter that outputs a screen and a manipulator that is manipulated by a user, and a method for controlling the same.

[Background]

[0002] An electronic device including a laundry treating apparatus that may wash, dry, or wash and dry laundry (an object to be washed or an object to be dried) essentially includes an input/output device (interface) for inputting, by a user, a control command to the electronic device.

[0003] In existing interfaces, a display unit that displays a control command selectable by the user, a search unit that allows the control command displayed on the display to be searched, a multi-function button that enables the user to select the control command displayed on the display, and an inputter that requests execution of the control command selected by the user were designed to be located in separate spaces (publication no. 10-2014-0023986).

[0004] That is, in the existing interfaces, a display (LCD, an LED panel, and the like) on which the control command is displayed, a knob or a button that allows the control command executable by the corresponding electronic device to be displayed on the display to be searched, a button that inputs a control command of selecting the control command displayed on the display, a button that inputs a control command of requesting execution of the selected control command, and the like were located in the separate spaces, respectively. Such an arrangement was an element that determines a design of the interface (a design of a control panel) located on a front surface of the electronic device such as the laundry treating apparatus.

[0005] In the existing interface of the above-described structure, because the respective devices including the display had to be dispersedly arranged along a width direction of the electronic device or dispersedly arranged along a height direction of the electronic device, a lot of space was required for installation of the interface.

[0006] Accordingly, it is important to efficiently arrange a screen outputter, a manipulator, an option unit, and the like constituting the interface to improve convenience of use and improve spatial utilization via the efficient arrangement.

[0007] In one example, a related document KR 10-2016-0062917 A discloses a laundry treating apparatus including the screen outputter. The laundry treating apparatus includes a rotatable knob around the screen outputter.

[0008] In the laundry treating apparatus, the user may select various selectable items displayed on the screen outputter via the rotation of the knob, and multiple buttons such as a start button of a course to treat laundry or a power button may be additionally disposed on the screen outputter.

[0009] Because the multiple buttons are disposed on the screen outputter, a screen area defined in an inner space defined by the knob may be reduced, and intuitiveness of each button for the user may be degraded.

[0010] Furthermore, a display of the screen outputter having a limited area because of the knob and the multiple buttons may be disadvantageous in displaying various information because of the limited output area.

[0011] Accordingly, it is important in the art that various buttons constituting the manipulator are efficiently arranged to effectively increase the screen area of the screen outputter, and the various information is effectively provided to the user in the limited screen area.

[0012] In one example, in a process in which the course for treating the laundry is performed, the user may need to add and treat the laundry as necessary. However, in the process of treating the laundry, there may be a safety risk such as water received in the tub or rotation of a drum.

[0013] Accordingly, it is important in the art to improve safety and improve convenience of use by selecting a process in which the laundry may be added during the process of treating the laundry and providing a laundry addition function to the user.

[Summary]

[Technical Problem]

[0014] Embodiments of the present disclosure are to provide a laundry treating apparatus including a screen outputter that may effectively provide various information to a user during a laundry treatment process and a manipulator with which the user may conveniently input a manipulation signal, and a method for controlling the same.

[0015] In addition, embodiments of the present disclosure are to provide a laundry treating apparatus and a method for controlling the same in which installation areas of a screen outputter that outputs a screen and a manipulator that generates a manipulation signal are effectively set in a limited area.

[0016] In addition, embodiments of the present disclosure are to provide a laundry treating apparatus including a manipulator that may efficiently generate various manipulation signals required for a user to perform a laundry treatment process and effectively reduce an installation space thereof, and a method for controlling the same.

[0017] In addition, embodiments of the present disclosure are to provide a laundry treating apparatus and a method for controlling the same that effectively display various information in a limited screen area to effectively improve convenience of use and improve space utilization.

[0018] In addition, embodiments of the present disclosure are to provide a laundry treating apparatus and a method for controlling the same that enable a user to effectively manipulate a manipulator in various situations via efficient configuration and utilization of the manipulator to treat laundry.

[0019] In addition, embodiments of the present disclosure are to provide a laundry treating apparatus and a method for controlling the same that may improve convenience of use by allowing laundry to be effectively added in a process of treating laundry.

[0020] In addition, embodiments of the present disclosure are to provide a laundry treating apparatus and a method for controlling the same that may effectively improve safety of use by selecting a process in which laundry may be added and providing a laundry addition function to a user.

[Technical Solutions]

[0021] One embodiment of the present disclosure provides a laundry addition function in which a user is able to additionally input laundry during a laundry treatment process. In addition, a multi-functional button for performing the laundry addition function may be provided.

[0022] The multi-function button may provide a different function for each process for the laundry treatment, and the multi-function button may have the laundry addition function during the laundry treatment process in which a course for the laundry treatment is performed.

[0023] In one example, the course for treating the laundry may include a plurality of processes, each of the plurality of processes may have the laundry addition function limited in terms of efficiency and safety, and the multi-function button may be activated during execution of a process in which the laundry addition function is able to be provided, thereby enabling a user to conveniently use the laundry addition function.

[0024] One embodiment of the present disclosure includes a cabinet, a drum, a manipulator, and a screen outputter. The drum is disposed inside the cabinet, is rotatable, and accommodates laundry therein.

[0025] The manipulator is disposed on the cabinet and manipulated by a user to generate a manipulation signal. the screen outputter is disposed on the cabinet and outputs a screen for providing information to the user.

[0026] The screen outputter outputs a course progress screen that displays execution information of a course for treating the laundry, and the manipulator includes a multi-function button activated in at least some of a plurality of processes performed in the course, wherein when the multi-function button is manipulated by the user in the activated state, a laundry addition process for additionally inputting the laundry is performed while the course is in progress.

[0027] The course progress screen may include a function display area that indicates that the multi-function button is activated and the laundry addition process is able to be performed.

[0028] The course progress screen may further include an executed course display area that displays a currently performed course, an execution time display area that displays time information of the currently performed course, an executed process display area that displays information on a process currently performed in the course, and an execution completion level display area that displays a completion level of the currently performed course.

[0029] The course progress screen may remove the function display area while a process where the laundry addition process is not able to be applied among the plurality of processes is in progress.

[0030] The screen outputter may be switched to a pause screen that displays a paused state of the course when the multi-function button activated in the course progress screen is manipulated.

[0031] The screen outputter may output the pause screen after outputting a laundry addition guidance screen illustrating the laundry addition process when the course progress screen is switched to the pause screen.

[0032] The laundry addition guidance screen may be output in a pop-up form for a preset time on the pause screen. The screen outputter may return to the course progress screen from the pause screen when the laundry addition process is ended.

[0033] The laundry treating apparatus may further include a controller that controls rotation of the drum, performs the course, sets whether the laundry addition process is able to be applied for each of a plurality of courses, and activates the multi-function button while a process where the laundry addition process is able to be applied is performed.

[0034] The laundry treating apparatus may further include a tub disposed in the cabinet and having the drum rotatably installed therein, wherein the tub receives water therein, and the controller performs a draining process of discharging water in the tub to the outside of the cabinet when the laundry addition process is performed.

[0035] The controller may discharge water in the tub in the draining process such that an amount of water in the tub is equal to or smaller than a predetermined reference water amount.

[0036] The cabinet may have a laundry inlet defined therein in communication with the inside of the drum and a laundry door that opens and closes the laundry inlet, and the controller may perform a door release process of releasing a locked state of the laundry door when the draining process is ended in the laundry addition process.

[0037] The manipulator may further include an execution button for instructing the controller to perform the course, and the controller may resume the course when the execution button is manipulated after the door release process in the laundry addition process.

[0038] The plurality of different courses may be stored in the controller, the screen outputter may output a course selection screen where the plurality of courses are dis-

played and one of the plurality of courses is selected based on the manipulation signal, and the controller may perform the course displayed on the course selection screen when the execution button is manipulated on the course selection screen, and control the screen outputter to output the course progress screen.

[0039] The multi-function button may vary a function depending on the screen output on the screen outputter.

[0040] A plurality of different courses may be stored in the controller, the screen outputter may output a course selection screen where the plurality of courses are displayed and one of the plurality of courses is selected based on the manipulation signal, and when the multi-function button is manipulated while the course selection screen is output, an option recommendation screen that displays a recommended option combination for the course displayed on the course selection screen may be output.

[0041] While the course progress screen is output on the screen outputter, the multi-function button may be activated in a washing process of the course and may be deactivated in a dehydration process of the course.

[0042] In one example, a method for controlling a laundry treating apparatus according to one embodiment of the present disclosure includes laundry addition determination of performing, by a controller, a course for treating laundry, and determining whether a laundry addition process for additionally inputting the laundry is able to be performed in a process currently performed based on the course, button function locking of deactivating, by the controller, a multi-function button disposed on a cabinet and manipulated by a user when it is determined in the laundry addition determination that the laundry addition process is not able to be performed in the currently performed process, and laundry addition function activation of activating, by the controller, the multi-function button when it is determined in the laundry addition determination that the laundry addition process is able to be performed in the currently performed process.

[0043] The method may further include, after the laundry addition function activation, laundry addition function display of controlling, by the controller, a screen outputter for providing information to the user to display a function of the multi-function button and notify the user that the laundry is able to be added.

[Advantageous Effects]

[0044] The embodiments of the present disclosure are to provide the laundry treating apparatus including the screen outputter that may effectively provide the various information to the user during the laundry treatment process and the manipulator with which the user may conveniently input the manipulation signal.

[0045] In addition, the embodiments of the present disclosure are to provide the laundry treating apparatus and the method for controlling the same in which the installation areas of the screen outputter that outputs the screen and the manipulator that generates the manipulation signal are effectively set in the limited area.

[0046] In addition, the embodiments of the present disclosure are to provide the laundry treating apparatus including the manipulator that may efficiently generate the various manipulation signals required for the user to perform the laundry treatment process and effectively reduce the installation space thereof, and the method for controlling the same.

[0047] In addition, embodiments of the present disclosure are to provide the laundry treating apparatus and the method for controlling the same that effectively display the various information in the limited screen area to effectively improve the convenience of use and improve the space utilization.

[0048] In addition, the embodiments of the present disclosure are to provide the laundry treating apparatus and the method for controlling the same that enable the user to effectively manipulate the manipulator in the various situations via the efficient configuration and utilization of the manipulator to treat the laundry.

[0049] In addition, the embodiments of the present disclosure are to provide the laundry treating apparatus and the method for controlling the same that may improve the convenience of use by allowing the laundry to be effectively added in the process of treating the laundry.

[0050] In addition, the embodiments of the present disclosure are to provide the laundry treating apparatus and the method for controlling the same that may effectively improve the safety of use by selecting the process in which the laundry may be added and providing the laundry addition function to the user.

[Brief Description of the Drawings]

[0051]

FIG. 1 is a view illustrating a laundry treating apparatus according to an embodiment of the present disclosure.

FIG. 2 is a view illustrating an inner cross-section of a laundry treating apparatus according to an embodiment of the present disclosure.

FIG. 3 is a view illustrating a state in which a front panel is disassembled from a laundry treating apparatus according to an embodiment of the present disclosure.

FIG. 4 is a view illustrating a control panel including a screen outputter and a manipulator in a laundry treating apparatus according to an embodiment of the present disclosure.

FIG. 5 is a view illustrating an option unit in a laundry treating apparatus according to an embodiment of the present disclosure.

FIG. 6 is a view illustrating a state in which a manipulation module including a screen outputter is disassembled from a laundry treating apparatus according to an embodiment of the present disclosure.

FIG. 7 is a view illustrating a state in which a screen outputter is disassembled from a laundry treating apparatus according to an embodiment of the present disclosure.

FIG. 8 is a view illustrating each component of a screen outputter in a laundry treating apparatus according to an embodiment of the present disclosure.

FIG. 9 is a view schematically illustrating screens output from a screen outputter based on respective progress steps in a laundry treating apparatus according to an embodiment of the present disclosure.

FIG. 10 is a view illustrating a notification screen among booting screens output from a screen outputter in a booting process according to an embodiment of the present disclosure.

FIG. 11 is a view illustrating a course selection screen among course setting screens output from a screen outputter in a course setting process according to an embodiment of the present disclosure.

FIG. 12 is a view illustrating a course progress screen among laundry treatment screens output from a screen outputter in a laundry treatment process according to an embodiment of the present disclosure.

FIGS. 13A, 13B, 13C, and 13D are views illustrating a reservation screen among course setting screens output from a screen outputter in a course setting process according to an embodiment of the present disclosure.

FIGS. 14A and 14B are views illustrating a state in which a function of a multi-function button is changed for each item on a reservation screen of a screen outputter according to an embodiment of the present disclosure.

FIGS. 15A and 15B are views illustrating activation of a laundry addition function on a course progress screen output from a screen outputter in a laundry treatment process according to an embodiment of the present disclosure.

FIGS. 16A, 16B, and 16C are views illustrating a laundry addition guidance screen of a screen outputter according to an embodiment of the present disclosure.

FIGS. 17A and 17B are views illustrating a pause screen of a screen outputter according to an embodiment of the present disclosure.

FIGS. 18A, 18B, and 18C are views illustrating a course cancellation screen of a screen outputter according to an embodiment of the present disclosure.

FIGS. 19A, 19B, and 19C are views illustrating a course change screen of a screen outputter according to an embodiment of the present disclosure.

FIGS. 20A and 20B are views illustrating a state in which a screen including a QR code is output from a screen outputter according to an embodiment of the present disclosure.

FIG. 21 is a view illustrating a control method for performing a laundry addition process during course execution in a laundry treating apparatus according to an embodiment of the present disclosure.

FIG. 22 is a view illustrating a control method including a process of ending a course in progress in a laundry treating apparatus according to an embodiment of the present disclosure.

[Detailed Description]

[0052] Hereinafter, an embodiment of the present disclosure will be described in detail with reference to the accompanying drawings such that a person having ordinary knowledge in the technical field to which the present disclosure belongs may easily implement the embodiment.

[0053] However, the present disclosure is able to be implemented in various different forms and is not limited to the embodiment described herein. In addition, to clearly describe the present disclosure, components irrelevant to the description are omitted in the drawings. Further, similar reference numerals are assigned to similar components throughout the present document.

[0054] Duplicate descriptions of the same components are omitted herein.

[0055] In addition, it will be understood that when a component is referred to as being 'connected to' or 'coupled to' another component herein, it may be directly connected to or coupled to the other component, or one or more intervening components may be present. On the other hand, it will be understood that when a component is referred to as being 'directly connected to' or 'directly coupled to' another component herein, there are no other intervening components.

[0056] Furthermore, the terminology used herein is for the purpose of describing the specific embodiment of the present disclosure only and is not intended to be limiting of the present disclosure.

[0057] As used herein, the singular forms 'a' and 'an' are intended to include the plural forms as well, unless the context clearly indicates otherwise.

[0058] It should be understood that the terms 'comprises', 'comprising', 'includes', and 'including' when used herein, specify the presence of the features, numbers, steps, operations, components, parts, or combinations thereof described herein, but do not preclude the presence or addition of one or more other features, numbers, steps, operations, components, or combinations thereof.

[0059] In addition, herein, the term 'and/or' includes a combination of a plurality of listed items or any of the plurality of listed items. Herein, 'A or B' may include 'A', 'B', or 'both A and B'.

[0060] Hereinafter, an embodiment of the present disclosure will be described in detail with reference to the accompanying drawings such that a person having ordinary knowledge in the technical field to which the present disclosure belongs may easily implement the embodiment.

[0061] However, the present disclosure is able to be implemented in various different forms and is not limited

to the embodiment described herein. In addition, to clearly describe the present disclosure, components irrelevant to the description are omitted in the drawings. Further, similar reference numerals are assigned to similar components throughout the present document.

[0062] Duplicate descriptions of the same components are omitted herein.

[0063] In addition, it will be understood that when a component is referred to as being 'connected to' or 'coupled to' another component herein, it may be directly connected to or coupled to the other component, or one or more intervening components may be present. On the other hand, it will be understood that when a component is referred to as being 'directly connected to' or 'directly coupled to' another component herein, there are no other intervening components.

[0064] Furthermore, the terminology used herein is for the purpose of describing the specific embodiment of the present disclosure only and is not intended to be limiting of the present disclosure.

[0065] As used herein, the singular forms 'a' and 'an' are intended to include the plural forms as well, unless the context clearly indicates otherwise.

[0066] It should be understood that the terms 'comprises', 'comprising', 'includes', and 'including' when used herein, specify the presence of the features, numbers, steps, operations, components, parts, or combinations thereof described herein, but do not preclude the presence or addition of one or more other features, numbers, steps, operations, components, or combinations thereof.

[0067] In addition, herein, the term 'and/or' includes a combination of a plurality of listed items or any of the plurality of listed items. Herein, 'A or B' may include 'A', 'B', or 'both A and B'.

[0068] FIG. 1 illustrates an outer appearance of a laundry treating apparatus 1 according to one embodiment of the present disclosure. As shown in FIG. 1, in one embodiment of the present disclosure, the laundry treating apparatus 1 may include a cabinet 10.

[0069] The cabinet 10 may form the outer appearance of the laundry treating apparatus 1, and a space in which a drum 30, a tub 20, and the like are disposed may be defined in the cabinet 10. Although the hexahedral cabinet 10 is illustrated in FIG. 1, there may be various specific shapes of the cabinet 10.

[0070] The cabinet 10 may include a plurality of panels. The plurality of panels may include a front panel 15, side panels, an upper panel, a lower panel, a rear panel, and the like. The plurality of panels may be coupled to each other to form the cabinet 10 together.

[0071] A detergent inlet 16 and a laundry inlet 17 may be defined in the front panel 15. The detergent inlet 16 may correspond to a passage through which a storage unit of a detergent supply moves, and the laundry inlet 17 may correspond to a passage through which a user inputs laundry into the drum 30 inside the cabinet 10.

[0072] That is, in one embodiment of the present disclosure, the cabinet 10 includes the front panel 15 having the detergent inlet 16 defined therein.

[0073] The front panel 15 may have a laundry door 40 for opening and closing the laundry inlet 17, and the laundry door 40 may be hinge-coupled to an outer side of the front panel 15 to be pivotable. The laundry inlet 17 of the front panel 15 may be opened or closed by the laundry door 40.

[0074] In one example, the tub 20 may be disposed inside the cabinet 10 and may receive water therein, and the drum 30 may be rotatably disposed in the tub 20 and may accommodate the laundry therein.

[0075] In one embodiment of the present disclosure, the drum 30 may include a plurality of communication holes through which the tub 20 and the inside of the drum are in communication with each other defined in an outer circumferential surface thereof, and thus water stored in the tub 20 may be provided into the drum 30 to be provided to the laundry.

[0076] In one example, as shown in FIG. 1, one embodiment of the present disclosure may include both the drum 30 and the tub 20, or may include only the drum 30 excluding the tub 20 as necessary. That is, one embodiment of the present disclosure may correspond to a washing machine that may perform a washing course for treating the laundry by including the drum 30 and the tub 20 in which water is received, or may correspond to a dryer that may perform a drying course for drying the laundry inside the drum 30 as the tub 20 is omitted and only the drum 30 is included.

[0077] However, one embodiment of the present disclosure may correspond to the laundry treating apparatus 1 including both the drum 30 and the tub 20 and including an air supply for drying the laundry to perform both the washing course and the drying course. Hereinafter, a form in which the drum 30 and the tub 20 are disposed together in the cabinet 10 will be described in one embodiment of the present disclosure.

[0078] In one example, one embodiment of the present disclosure may include the detergent supply for a progress of the washing course. The detergent supply is disposed inside the cabinet 10 or is disposed outside the cabinet 10 to supply detergent into the tub 20 or the drum 30.

[0079] In the present disclosure, the detergent includes not only a washing agent for removing foreign substances from the laundry, a softener for improving flexibility of a fiber, a bleaching agent for improving a color of the fiber, and the like. In addition, the detergent may be defined to include various forms and types of detergent such as powdered detergent, liquid detergent, and the like.

[0080] The detergent supply may include the storage unit in which the detergent is stored, and the storage unit may be retracted into or extended from the cabinet 10 through the detergent inlet 16 of the front panel 15.

[0081] In one example, one embodiment of the present disclosure may include a control panel 100 including a screen outputter 8 that outputs a screen and a manipu-

lator manipulated by the user to generate a manipulation signal.

[0082] FIG. 1 illustrates a state in which the control panel 100 is disposed on the front panel 15 according to an embodiment of the present disclosure. However, the control panel 100 may be disposed not only on the front panel 15, but also on the top panel, the side panel, or the like, or may be disposed on each of a plurality of panels.

[0083] Referring to FIG. 1, in one embodiment of the present disclosure, the control panel 100 may be disposed at an upper end portion of the front panel 15. The upper end portion of the front panel 15 may be understood as a portion including an upper end of the front panel 15 and the control panel 100.

[0084] The control panel 100 may be manufactured separately from the front panel 15 and coupled to the front panel 15, or a portion of the front panel 15 may correspond to the control panel 100. When the control panel 100 is manufactured separately from the front panel 15, the control panel 100 may be disposed on the front panel 15 to form a front surface of the cabinet 10 together with the front panel 15.

[0085] The control panel 100 may include the manipulator, and the manipulator may include a button manipulated by the user. The manipulator may be manipulated by the user to generate the manipulation signal, and the manipulation signal may be transmitted to a controller 60, which will be described later.

[0086] In the present disclosure, the manipulator may collectively refer to an object that is manipulated by the user and generates the manipulation signal, and may include a dial 56, a multi-function button 91, an option button, an additional option button, and the like, which will be described later. The manipulator will be described in detail later.

[0087] In one example, the control panel 100 may include the screen outputter 8, and the screen outputter 8 may include a display 84 or the like to output the screen for providing information to the user. The screen outputter 8 will be described in detail later with reference to the manipulator.

[0088] In one example, one embodiment of the present disclosure may include the controller 60, and the controller 60 may be connected to the controller 60 in electrical and signal manners. In addition, the controller 60 may be connected to an object, such as a driver for rotating the drum 30 or a water supply for supplying water, requiring electrical/electronic control in the electrical and signal manners.

[0089] The controller 60 may receive the signal input to the manipulator by the user and control each component of the laundry treating apparatus 1 based on the transmitted signal. In addition, an operating state or the like of the laundry treating apparatus 1 may be transmitted to the user via the manipulator based on the signal transmitted from each component.

[0090] In one example, FIG. 2 is a view illustrating an inner cross-section of the laundry treating apparatus 1 according to an embodiment of the present disclosure. The inside of the laundry treating apparatus 1 according to one embodiment of the present disclosure will be schematically described as follows with reference to FIG. 2.

[0091] The laundry inlet 17 of the front panel 15 may be shielded by the laundry door 40, and the user may open the laundry inlet 17 by manipulating the laundry door 40 when the user is to wash the laundry.

[0092] The laundry may be put into the opened laundry inlet 17, and laundry introduced through the laundry inlet 17 may pass through a tub opening 22 of the tub 20 and a drum opening 32 of the drum 30 and may be introduced into the drum 30.

[0093] The tub 20 may be fixed inside the cabinet 10, and a front surface of the tub 20 facing the laundry inlet 17 may be opened to define the tub opening 22. The tub 20 may be connected to the front panel 15 via a gasket for preventing deviation of the laundry and preventing water leakage. In addition, the tub 20 may be supported in the cabinet 10 via a damper to minimize vibration transmitted to the cabinet 10.

[0094] The drum 30 may be disposed inside the tub 20, and a front surface of the drum 30 facing the tub opening 22 and the laundry inlet 17 may be opened to define the drum opening 32. That is, the laundry inlet 17, the tub opening 22, and the drum opening 32 may be aligned in parallel with each other to be in communication with each other.

[0095] As described above, the drum 30 may have the plurality of communication holes defined in the outer circumferential surface thereof, so that water received in the tub 20 may be provided into the drum 30. In addition, the drum 30 may be rotatable with a rotational shaft.

[0096] The drum 30 may be connected to the driver via the rotational shaft. The driver may provide a rotational force based on the signal of the controller 60, and the rotational force of the driver may be transmitted to the drum 30 via the rotational shaft to rotate the drum 30.

[0097] In one embodiment of the present disclosure, as shown in FIG. 2, a front loader type in which the rotational shaft of the drum 30 is extended in a front and rear direction and the laundry inlet 17 is defined in the front panel 15 is described, but the present disclosure may not be limited thereto, and may be a top loader type in which the laundry inlet 17 is defined in the upper panel. Hereinafter, the front loader type will be described unless separately mentioned otherwise.

[0098] In one example, the laundry treating apparatus 1 according to one embodiment of the present disclosure may be connected to an external water supply source to receive water. The water supply connected to the external water supply source may be disposed in the cabinet 10.

[0099] The water supply may include a water supply valve, and the controller 60 may supply water into the tub 20 in a washing process or the like via control of the water supply valve. The water supply may supply water into the tub 20 via the detergent supply or directly supply

water into the tub 20 separately from the detergent supply.

[0100] The detergent supply may be connected to the water supply via a water supply hose. That is, the detergent supply may receive water from the water supply and supply the detergent and water into the tub 20 or the drum 30 together.

[0101] In one example, the laundry treating apparatus 1 according to one embodiment of the present disclosure may include a drainage, and the drainage may be connected to the tub 20 to discharge water received in the tub 20 to the outside.

[0102] In one example, FIG. 2 schematically illustrates the controller 60 disposed inside the cabinet 10 according to an embodiment of the present disclosure. As described above, the controller 60 may be connected to a plurality of components such as the driver of the drum 30 and the control panel 100.

[0103] The controller 60 may perform a course for treating the laundry based on the manipulation signal of the manipulator and the like. For example, the controller 60 may control the water supply, the driver, and the like to perform the corresponding course in response to that a course execution signal for treating the laundry is received via the manipulator.

[0104] The controller 60 may be disposed in a partial space of the cabinet 10 or may be disposed inside the control panel 100. For example, the controller 60 may be formed in a shape of a module and may be disposed on a base located on a lower panel of the cabinet 10.

[0105] In addition, the controller 60 may be disposed inside the control panel 100, for example, included in a portion of the screen outputter 8 or the manipulator. In addition, the controller 60 may be composed of a plurality of segments and the segments may be respectively disposed in the control panel 100, the base, and the like to be operated together.

[0106] In one example, referring to FIGS. 1 and 2, in one embodiment of the present disclosure, the controller 60 may be connected in the signal manner to a communication terminal 70 portable by the user. The communication terminal 70 may be separated from the cabinet 10 and independently movable, may include a communication function, and may be carried by the user.

[0107] For example, the communication terminal 70 may correspond to a mobile phone or the like that may be carried by the user. FIGS. 1 and 2 schematically illustrate the communication terminal 70 corresponding to the mobile phone.

[0108] However, in one embodiment of the present disclosure, the communication terminal 70 may not be necessarily limited thereto, and may be of various types that may be in direct or indirect communication with the controller 60.

[0109] The controller 60 may be in communication with the communication terminal 70 in various ways. That is, the controller 60 may be connected in the signal manner to the communication terminal 70 via various schemes.

[0110] For example, the communication terminal 70 may be directly connected to the controller 60 via various schemes capable of transmitting and receiving wireless signals, such as Wi-Fi, Bluetooth, and NFC, or may be indirectly connected to the controller 60 using intermediate means disposed inside or outside the laundry treating apparatus 1 to transmit and receive a communication signal.

[0111] For example, the controller 60 may be connected to a Wi-Fi module or the like disposed inside or outside the laundry treating apparatus 1 together with the communication terminal 70 to transmit and receive a signal to/from the communication terminal 70 via the Wi-Fi module.

[0112] Alternatively, the controller 60 may be connected in the signal manner to the communication terminal 70 via a communication server by transmitting and receiving a signal to and from the communication server corresponding to a terminal base station or the like for communication of the communication terminal 70 by being connected to the Wi-Fi module or the like.

[0113] The communication scheme of the controller 60 described above is merely an example for describing one embodiment of the present disclosure, and is not limited to the above description. In one embodiment of the present disclosure, various schemes in which the controller 60 and the communication terminal 70 may directly or indirectly transmit and receive the signal to and from each other may be available.

[0114] An application capable of exchanging information with the laundry treating apparatus 1 may be installed in the communication terminal 70 of the user, and various information provided from the controller 60 may be transmitted to the application via an external server or may be directly transmitted via schemes such as Bluetooth.

[0115] The user may identify various information of the laundry treating apparatus 1 or command various settings and execution using the communication terminal 70 as well as the control panel 100 of the laundry treating apparatus 1.

[0116] In one example, FIG. 3 illustrates a state in which the front panel 15 is removed from the cabinet 10 in an embodiment of the present disclosure. A configuration of the front panel 15 will be described as follows with reference to FIG. 3.

[0117] As described above, the front panel 15 has the laundry inlet 17 and the detergent inlet 16 defined therein. The laundry inlet 17 may be opened and closed by the laundry door 40, and the storage unit of the detergent supply may be inserted into the detergent inlet 16.

[0118] A handle that may be gripped by the user may be disposed at a front end of the storage unit, and a front surface of the handle may form the front surface of the laundry treating apparatus 1 together with the front panel 15 in response to that the storage unit is retracted into the cabinet 10.

[0119] In one example, a panel support 101 that improves rigidity of the front panel 15 and fixes the screen

outputter 8 or the manipulator of the control panel 100 may be disposed at the rear of the front panel 15. The panel support 101 may be coupled to the front panel 15 or coupled to the upper panel and the side panel.

[0120] The panel support 101 may be formed in a plate shape extending in a width direction of the cabinet 10. The panel support 101 may correspond to a plate disposed in parallel with the front surface of the cabinet 10. The panel support 101 may be disposed at an upper side of the front panel 15, and at least a portion of the screen outputter 8 and the manipulator may be coupled to the panel support 101.

[0121] The panel support 101 may be coupled to a panel flange of the front panel 15. The panel flange may have a flange shape extending rearward from an edge of the front panel 15, and the panel support 101 may be coupled to an upper side of the panel flange.

[0122] In one example, in one embodiment of the present disclosure, the screen outputter 8 and a portion of the manipulator may constitute a manipulation module 50 together. That is, in one embodiment of the present disclosure, the manipulation module 50 may include the screen outputter 8 and at least portions of the manipulator.

[0123] The manipulation module 50 may be coupled to the panel support 101 at the rear of the front panel 15. The manipulation module 50 may include the dial 56, a power button 53a, an execution button 53b, and the like corresponding to the portion of the manipulator together with the screen outputter 8.

[0124] An opening may be defined in the front panel 15 such that the screen outputter 8 or the like of the manipulation module 50 is exposed forward. That is, in the manipulation module 50 coupled and fixed to the panel support 101 at the rear of the front panel 15, the plurality of buttons and the screen outputter 8 may be exposed forward through the opening of the front panel 15.

[0125] In one example, FIG. 4 illustrates the control panel 100 according to one embodiment of the present disclosure. The control panel 100 according to one embodiment of the present disclosure will be described as follows with reference to FIG. 4.

[0126] The control panel 100 may be disposed on the cabinet 10 to form a portion of the outer appearance of the laundry treating apparatus 1. The control panel 100 may be disposed at various locations such as the upper panel, the front panel 15, and the like. FIG. 1 illustrates the control panel 100 disposed at the upper end portion of the front panel 15.

[0127] In one embodiment of the present disclosure, the control panel 100 may be disposed on the front panel 15. The control panel 100 may be manufactured separately from the front panel 15 and coupled to the front panel 15, or a portion of the front panel 15 may correspond to the control panel 100.

[0128] The control panel 100 may have a bar-shaped plate shape extending along the width direction of the cabinet 10. When the portion of the front panel 15 corresponds to the control panel 100, the front panel 15 may have an opening in an area corresponding to the control panel 100, and the screen outputter 8, the manipulator, and the like located at the rear of the front panel 15 may be exposed forwardly of the front panel 15 via the opening to be identified or manipulated by the user.

[0129] Referring to FIG. 4, in one embodiment of the present disclosure, the control panel 100 may include the screen outputter 8, an option unit 200, the power button 53a, and the execution button 53b. As will be described below, the screen outputter 8 may include the dial 56 and the multi-function button 91, and the option unit 200 may include the option button and the additional option button.

[0130] The power button 53a, the execution button 53b, the dial 56, the multi-function button 91, the option button, and the additional option button may constitute the manipulator together. That is, the manipulator may include the power button 53a, the execution button 53b, the dial 56, the multi-function button 91, the option button, and the additional option button.

[0131] The screen outputter 8 and the option unit 200 may be arranged along the width direction of the cabinet 10. Accordingly, the screen outputter 8 and the option unit 200 may be efficiently arranged in the control panel 100 in the form of extending along the width direction of the cabinet 10.

[0132] In one example, in one embodiment of the present disclosure, the control panel 100 may include the power button 53a and the execution button 53b. The power button 53a and the execution button 53b may correspond to the portion of the manipulator. That is, the manipulator may include the power button 53a and the execution button 53b.

[0133] The user may manipulate the power button 53a to allow the laundry treating apparatus 1 to be turned on. The power button 53a may be of a touch type or a mechanical button type, and may generate a power signal corresponding to the manipulation signal when manipulated by the user.

[0134] The controller 60 may stand by in a sleep state in which the controller 60 may receive a signal from the power button 53a in a turned off state, and may be switched to a sleep-on state in response to that the power signal is transmitted from the power button 53a to control the laundry treating apparatus 1 such that power is supplied to each component of the laundry treating apparatus 1.

[0135] In one example, the user may manipulate the execution button 53b to command the laundry treating apparatus 1 to perform a laundry treatment process P3 of treating the laundry. The execution button 53b may be of a touch type or a mechanical button type, and generate an execution signal, which is a kind of the manipulation signal, when manipulated by the user. In response to that the execution signal is transmitted in the sleep-on state, the controller 60 may control the driver, the water supply, and the like to perform the laundry treatment process P3

for treating the laundry.

[0136] In one example, the power button 53a and the execution button 53b, which are essentially manipulated by the user and have high importance in use of the laundry treating apparatus 1 according to one embodiment of the present disclosure, may be disposed independently of the screen outputter 8 and the option unit 200 so as to be easily recognized by the user.

[0137] The power button 53a and the execution button 53b may be disposed in a remaining area excluding the screen outputter 8 and the option unit 200 in the control panel 100. The power button 53a and the execution button 53b may be disposed on both sides of the screen outputter 8.

[0138] FIG. 4 illustrates a state in which the power button 53a is disposed on one side of the screen outputter 8 with respect to the width direction of the cabinet 10, and the execution button 53b is disposed on the other side of the screen outputter 8 according to an embodiment of the present disclosure. The execution button 53b may be disposed between the screen outputter 8 and the option unit 200.

[0139] In one example, the option unit 200 is illustrated in FIG. 5. In one embodiment of the present disclosure, various courses for treating the laundry are pre-stored in the controller 60, and the user may identify an option state of each course or adjust the option via the option unit 200.

[0140] The option unit 200 may include a plurality of option adjustors respectively corresponding to a plurality of options. According to one embodiment of the present disclosure, there are the plurality of options in which a plurality of option values selectable by the user exist, and the plurality of option adjustors are to adjust option setting values for different options, respectively.

[0141] In one embodiment of the present disclosure, any one option may include the plurality of option values selectable by the user, and any one of the plurality of option values may be set as an option setting value for the corresponding option and be reflected in the course of treating the laundry.

[0142] FIG. 5 illustrates the option unit 200 including a first option unit 210, a second option unit 220, and a third option unit 230 according to one embodiment of the present disclosure. The first option unit 210, the second option unit 220, and the third option unit 230 correspond to the option adjustors. That is, the option unit 200 may include the option adjustors, and the option adjustors may include the first option unit 210, the second option unit 220, and the third option unit 230.

[0143] The number of option adjustors may correspond to the number of adjustable options with respect to the course, and may be determined as various numbers. For example, one embodiment of the present disclosure may include a first option regarding the number of rinsing, a second option regarding the number of dehydration, and a third option regarding a water temperature, and the option adjustors may also include the first option unit 210 for the first option, the second option unit 220 for the second option, and the third option unit 230 for the third option.

[0144] However, the number of options and the option contents as described above are merely for convenience of description and are not limited thereto. The number of options and the number of option adjustors may vary, and specific option contents corresponding to the first, second, and third options may also vary as necessary.

[0145] The option adjustor included in the option unit 200 may include an option indicator and the option button. That is, the option unit 200 may include the option indicator and the option button, and the option button may correspond to a portion of the above-described manipulator.

[0146] For example, in one embodiment of the present disclosure, the option unit 200 may include the plurality of option adjustors, the plurality of option adjustors may include a first option adjustor, a second option adjustor, and a third option adjustor, the first option adjustor may include a first option indicator 211 and a first option button 212, the second option adjustor may include a second option indicator 221 and a second option button 222, and the third option adjustor may include a third option indicator 231 and a third option button 232.

[0147] The option indicator may display a current option setting value of an option corresponding to the corresponding option adjustor, and the option button may change the option setting value of the option corresponding to the corresponding option adjustor.

[0148] That is, the user may manipulate any one option button of the plurality of option adjustors in the option unit 200 to generate an option adjustment signal for the corresponding option, and the controller 60 may change a target set as the option setting value among the plurality of option values for the corresponding option based on the option adjustment signal. That is, the controller 60 may change the option setting value of the corresponding option based on the option adjustment signal.

[0149] The option indicator may include a plurality of light emitters 205. The number of plurality of light emitters 205 may correspond to the number of option values of the option corresponding to the corresponding option indicator. In addition, the option indicator may provide option setting value information of the corresponding option to the user via light emitting characteristics of the plurality of light emitters 205.

[0150] For example, in one embodiment of the present disclosure, the option adjustor may include the first option unit 210, the first option unit 210 may include the first option indicator 211 for displaying the option setting value of the first option, and the first option indicator 211 may include the plurality of light emitters 205 respectively corresponding to the option values for the first option.

[0151] The user may change the option setting value of the first option by manipulating the first option button 212, and the first option indicator 211 may display the current option setting value to the user as a light emitter

205 corresponding to the currently set option setting value emits light.

[0152] That is, when the first option button 212 is manipulated, the controller 60 may change the option setting value of the first option, and may control the first option indicator 211 such that a light emitter 205 corresponding to a current option setting value of the first option emits light.

[0153] In one example, the option unit 200 may further include the additional option button in addition to the option adjustor. The additional option button may be to set an additional option. For example, the user may manipulate the additional option button to apply, execute, cancel, or terminate the corresponding additional option.

[0154] In one embodiment of the present disclosure, unlike the option that is adjusted by the option adjustor, the additional option does not have a plurality of option values. Whether to apply the additional option or whether to proceed with the additional option may be determined.

[0155] For example, in one embodiment of the present disclosure, the additional option button may include a setting button 240, a reservation button 250, a steam button, and the like.

[0156] In the additional option button, whether to apply steam may only be set as in the steam button, or whether to proceed with a setting step may only be set as in the setting button 240. However, the present disclosure is not necessarily limited thereto, and the additional option may also include the plurality of option values, like the option adjusted by the option adjustor, or whether to apply may only be determined in the option adjusted by the option adjustor as in the additional option.

[0157] In one example, when the setting button 240 of the additional option button is manipulated by the user, a setting screen may be output on the screen outputter 8 and the setting step may be performed. That is, when a setting signal of the setting button 240 is transmitted, the controller 60 may control the screen outputter 8 to output the setting screen on the screen outputter 8.

[0158] In addition, when the reservation button 250 of the additional option button is manipulated by the user, a reservation screen 470 may be output on the screen outputter 8 and a reservation step may be performed. That is, when a reservation signal of the reservation button 250 is transmitted, the controller 60 may control the screen outputter 8 to output the reservation screen 470 on the screen outputter 8. The setting step and the reservation step will be described in detail later.

[0159] In one example, in one embodiment of the present disclosure, a plurality of additional option buttons may be arranged in a grid shape to realize an efficient arrangement in a restricted area of the option unit 200. In addition, in the option adjustor, the plurality of light emitters 205 may be aligned in a line, which is advantageous in intuitively recognizing a change in the option value.

[0160] FIG. 5 shows a state in which the plurality of option adjustors are aligned along the width direction of the cabinet 10 and the additional option buttons are arranged in the grid shape on one side of the option adjustors.

[0161] Each of the option buttons and the additional option buttons constituting a portion of the manipulator may indicate a name of the corresponding option. Furthermore, the option indicator, the option button, and the additional option button are able be able to emit light to improve aesthetics of the outer appearance, and at the same time, only an option adjustor or an additional option button corresponding to an option capable of being manipulated for each course for treating the laundry emits light to provide convenience to the user.

[0162] In one example, FIG. 6 is an exploded view of the manipulation module 50 according to an embodiment of the present disclosure. One embodiment of the present disclosure may include the manipulation module 50 in which the screen outputter 8 and at least the portion of the manipulator are modularized together.

[0163] Although FIG. 6 illustrates a structure including the screen outputter 8, the power button 53a, and the execution button 53b in the manipulation module 50, a portion of the manipulator may be additionally included in the manipulation module 50 or other components may be added to the manipulation module 50 as necessary.

[0164] Referring to FIG. 6, in one embodiment of the present disclosure, the manipulation module 50 may be disposed inside the front panel 15. That is, the manipulation module 50 may be positioned between a front surface of the front panel 15 and the panel support 101. The inside of the front panel 15 may refer to an area surrounded by the front surface of the front panel 15 and the panel flange described above.

[0165] The inside of the front panel 15 may be located at the rear of the front surface of the front panel 15 and may be opened rearward. The inside of the front panel 15 may be located forwardly of the upper panel, the side panels, and the lower panel.

[0166] The manipulation module 50 may be coupled to the front surface of the panel support 101 and disposed inside the front panel 15. The manipulation module 50 may include a manipulation housing 51 coupled to the panel support 101. The manipulation housing 51 may include a substrate 52 electrically connected to the power button 53a, the execution button 53b, the dial 56, and the screen outputter 8.

[0167] The substrate 52 may be disposed inside the manipulation housing 51, and may be connected to the power button 53a, the execution button 53b, and the screen outputter 8. The manipulation housing 51 may be filled with a sealer to secure water-tightness after the substrate 52 is accommodated therein.

[0168] In one example, the power button 53a and the execution button 53b may include a power button housing and an execution button housing 54b coupled to the substrate 52, respectively. A power button housing 54a and the execution button housing may be coupled to or connected to the substrate 52 in various manners, and

may include buttons exposed forwardly of the front panel 15.

[0169] The power button 53a and the execution button 53b may sense a physical force or an electric force transmitted by the user to generate an input signal of the user. For example, the power button 53a and the execution button 53b may be of a mechanical type that physically moves or of a touch type that does not physically move, but senses contact of the user

[0170] The power button 53a and the execution button 53b may generate an electrical signal when pressed by the user, or generate the electrical signal to be transmitted to the controller 60 when a user's hand is in contact therewith and the electric force is input.

[0171] In one example, the manipulation module 50 may include the screen outputter 8, and the screen outputter 8 may include the dial 56. In addition, the screen outputter 8 may include an output housing 57 coupled to the substrate 52, and may include a rotation sensor 58 for sensing rotation of the dial 56.

[0172] The screen outputter 8 may provide the user with a screen corresponding to an output signal transmitted by the controller 60. At least a partial area of the screen outputter 8 may correspond to a touch area that may receive a touch signal of the user. The dial 56 may surround a circumference of the screen outputter 8, and the user may rotate the dial 56 of the screen outputter 8 to transmit the input signal to the controller 60.

[0173] The rotation sensor 58 may be disposed inside the output housing 57, and may be connected to the dial 56 to sense the rotation of the dial 56. The rotation sensor 58 may include a magnetic force generator and may correspond to an encoder including a fixed body and a rotating body.

[0174] The rotating body of the rotation sensor 58 may be connected to the dial 56 to rotate together with the dial 56. When the user rotates the dial 56, as the rotating body rotates, the rotation sensor 58 may generate an electrical signal by the rotation of the rotating body and transmit the electrical signal to the controller 60.

[0175] According to one embodiment of the present disclosure, the manipulation module 50 may be disposed inside the front panel 15, and thus, the front panel 15 may have a length in the front and rear direction sufficient to accommodate the manipulation module 50 therein. For example, a length of the panel flange of the front panel 15 extending rearward may be greater than a length of the manipulation module 50 in the front and rear direction.

[0176] In one example, FIG. 7 illustrates an example of the screen outputter 8. The screen outputter 8 may include a housing 81 fixed to the rotation sensor 58, a display 84 that is fixed to the housing and displays information (information related to control, operation, and the like of the laundry treating apparatus), and a circuit board 82 disposed in the housing and having a circuit for controlling the display 84.

[0177] The housing 81 may include a fastening body 81b fixed to the rotation sensor 58 and an accommodating body 81a accommodated in the rotation sensor 58.

[0178] The accommodating body 81a may be formed in any shape to be inserted into the rotation sensor 58. FIG. 7 illustrates an example in which the accommodating body 81a is formed in a cylindrical shape.

[0179] A mounting space 811 is defined inside the accommodating body 81a, and an accommodating body through-hole 812 is defined in a space provided by the accommodating body 81a. The fastening body 81b may be formed in any shape to be inserted into the rotation sensor 58. The fastening body 81b has a fastening body through-hole 815 defined therein that is connected to the mounting space 811.

[0180] A fixed body fastening portion 816 may be disposed on a circumferential surface of the fastening body 81b. Furthermore, a plurality of positioning protrusions 817 may be further disposed on the circumferential surface of the fastening body 81b.

[0181] The positioning protrusion 817 has a shape that may be inserted into a positioning groove defined in the rotation sensor 58, and the positioning protrusion 817 is located at a location corresponding to a location of the positioning groove.

[0182] The positioning protrusion 817 and the positioning groove are means for minimizing a risk that the fixed body fastening portion 816 is not coupled to the fixed body when the fastening body 81b is inserted.

[0183] As shown in FIG. 7, the circuit board 82 of the display 84 may be inserted into the mounting space 811, and a wire 822 connected to the circuit board 82 of the display 84 may be drawn out of the housing 81 via the fastening body through-hole 815. Multiple lamps 821 may be disposed on the circuit board 82 of the display 84.

[0184] To maintain a gap between the circuit board 82 of the display 84 and the display 84 and to prevent damage to the lamp 821, a mounting portion 83 positioned between the display 84 and the second circuit board 82 may be disposed in the mounting space 811.

[0185] The mounting portion 83 may be composed of a mounting body 831 fixed to the accommodating body 81a and positioned inside the mounting space 811. The mounting body 831 may be formed in any shape to be inserted into the mounting space 811. FIG. 7 illustrates an example in which the mounting body 831 has a substantially cylindrical shape.

[0186] A seating groove 832 to which the display 84 is fixed is defined in one surface of the mounting body 831. A connector through-hole 836 may be defined in the seating groove 832. A connector (a flexible PCB and the like) 841 disposed on the display 84 may be inserted into the connector through-hole 836 to be connected to the circuit board 82 of the display 84.

[0187] A lamp through-hole 835 into which the lamp 821 is inserted may be defined in the mounting body 831. It is preferable that the number of lamp through-holes 835 is equal to the number of lamps 821. A location of the lamp through-hole 835 should be set to be a space of the mounting body located above the seating groove

832 or a space of the mounting body located below the seating groove 832. This is for light emitted from the lamp 821 to be transmitted to the outside of the housing 81 via the lamp through-hole 835.

[0188] The mounting portion 83 is fixed to the housing 81 via a mounting body fastening portion 813 disposed in the accommodating body 81a and a accommodating body fastening portion 833 defined in the mounting body 831.

[0189] The mounting body fastening portion 813 may be formed as each of multiple protrusions located inside the mounting space 811, and the accommodating body fastening portion 833 may be defined as each of grooves that are defined in a circumferential surface of the mounting body 831 (one surface of the mounting body in contact with the accommodating body) and to which the mounting body fastening portion 813 is fixed. In one example, a spacer 814 having a protrusion shape may be disposed on a circumferential surface of the accommodating body 81a.

[0190] The number of the mounting body fastening portions 813 and the number of accommodating body fastening portions 833 should be set to be equal to each other, and locations of the mounting body fastening portion 813 and the accommodating body fastening portion 833 should be set to correspond to each other.

[0191] To increase a fastening force of the mounting body 831, the accommodating body fastening portions 833 may be composed of upper fastening portions located at a higher point than the seating surface 832 and lower fastening portions located at a lower point than the seating surface 832. Unlike the drawing, the accommodating body fastening portions 833 may be defined on left and right sides of the seating surface.

[0192] A cover 85 may be further disposed on the accommodating body 81a to prevent water and foreign substances from being introduced onto the display 84 and the circuit board 82 of the display 84.

[0193] It is preferable that the cover 85 is fixed to at least one of the accommodating body 81a and the mounting body 831 to close the accommodating body through-hole 812. The cover 85 may be made of a material having a transparency at a level at which the information displayed on the display 84 and light emitted from the lamp 821 may be checked from the outside.

[0194] When the cover 85 is fixed to the mounting body 831, the cover 85 may have a cover fixing protrusion 851 protruding toward the mounting body 831, and the mounting body 831 may have a fixing protrusion fastening portion 834 to which the cover fixing protrusion 851 is coupled.

[0195] The circuit board 82 of the display 84 may also be fixed to the mounting body 831. That is, the mounting portion 83 may include a protrusion 838 protruding from the mounting body 831 toward the second circuit board 82, and the second circuit board 82 may have a protrusion through-hole 823 defined therein into which the protrusion 838 is inserted.

[0196] In addition, the cover 85 may further include a cover sheet 853 that lowers the transparency of the cover. Transparency of the cover sheet is preferably set to an extent that the inside of the mounting space 811 is difficult to be checked from the outside.

[0197] The cover sheet 853 may be fixed to a surface of the cover 85, and characters or symbols may be formed in an area onto which the lamp through-hole 835 is projected of the cover sheet.

[0198] As shown in FIG. 7, the screen outputter 8 may further include the multi-function button 91 that receives the control command displayed on the display 84.

[0199] The multi-function button 91 may determine whether the control command displayed on the display 84 is selected by sensing whether the user's body is in contact with the cover 85.

[0200] That is, the multi-function button 91 may include a sensor 93 disposed on the second circuit board 82 to sense static electricity of the user's body, and a conductor that connects the sensor 93 with the cover 85. The conductor may include a first conductor fixed to the cover 85 and a second conductor 92 having one end connected to the first conductor and the other end connected to the sensor 93. In this case, a conductor through-hole 837 into which the second conductor 92 is inserted should be defined in the mounting body 831.

[0201] The sensor 93 and the second conductor 92 together form a signal sensor 9. The first conductor is means for facilitating input of the control command by expanding an area that may be in contact with the user.

[0202] The screen outputter 8 having the above-described structure enables display of the control command, search of the displayed control command, and selection of the displayed control command, and enables minimization of a space required for installation. However, the screen outputter 8 having the above-described structure requires means for discharging water or the foreign substances introduced thereinto to the outside.

[0203] In one example, the screen outputter 8 may include a sealing (a fastening body sealing) that prevents the foreign substances from flowing into the fastening body through-hole 815, and a cover sealing 852 that blocks a space between the cover 85 and the accommodating body through-hole 812.

[0204] The cover sealing 852 may be made of an adhesive material that is sprayed onto the accommodating body 81a along an edge of the cover 85 to fill a space between the cover 85 and the accommodating body 812 and fix the cover 85 to the accommodating body 812.

[0205] In one example, FIG. 8 shows an outer appearance of the screen outputter 8 exposed to the outside via the control panel 100. In one embodiment of the present disclosure, the screen outputter 8 may include the display 84 that outputs the screen for providing the information to the user, a screen circumferential portion 849 into which the display 84 is inserted and fixed, and the multi-function button 91 disposed in the screen circumferential portion 849 and manipulated by the user.

[0206] The screen circumference portion 849 may correspond to a remaining area excluding an area of the display 84 in the above-described cover.

[0207] The screen outputter 8 may protrude forward from the control panel 100, and the aforementioned dial 56 may be disposed on an outer circumferential surface of the screen outputter 8. The screen outputter 8 may have a circular cross-section to facilitate the rotation of the dial 56 corresponding to the rotating body.

[0208] The display 84 of the screen outputter 8 may be exposed to the outside to output the screen, and may have a rectangular cross-section. That is, the screen outputter 8 may have the rectangular display 84 disposed inside the screen circumferential portion 849 having a circular shape.

[0209] In one example, the multi-function button 91 may be exposed to the outside on the screen circumferential portion 849. As described above, the multi-function button 91 may react to the static electricity or the like present in the user's body.

[0210] The multi-function button 91 may be disposed between an outer edge of the screen circumferential portion 849 and the display 84. In one embodiment of the present disclosure, the control panel 100 may be located on the front panel 15 of the cabinet 10, the screen outputter 8 may protrude forward from the control panel 100, and the multi-function button 91 may be located below the display 84 at the screen outputter 8.

[0211] The multi-function button 91 may be manipulated by the user to generate the manipulation signal, and a function of the multi-function button 91 may be changed based on the screen output on the screen outputter 8.

[0212] That is, the controller 60 may perform different functions based on the manipulation signal transmitted from the multi-function button 91 based on the screen output on the screen outputter 8. The controller 60 may ignore the manipulation signal of the multi-function button 91 or deactivate the multi-function button 91 depending on the screen.

[0213] In one example, FIG. 9 schematically illustrates a screen change of the screen outputter 8 based on an operation process of the laundry treating apparatus 1 according to one embodiment of the present disclosure.

[0214] The operation processes of the laundry treating apparatus 1 according to one embodiment of the present disclosure may include a booting process P1, a course setting process P2, and a laundry treatment process P3. The booting process P1 corresponds to a process in which each component of the laundry treating apparatus 1 is turned on and a program or the like stored in the controller 60 is booted.

[0215] The course setting process P2 corresponds to a process in which one of a plurality of courses for treating the laundry is selected by the user and various settings for the course are performed.

[0216] The laundry treatment process P3 corresponds to a process in which the laundry is treated based on the course determined in the course setting process P2. In the laundry treatment process P3, the controller 60 controls the driver or other components and performs the course.

[0217] In one example, the screen outputter 8 may output a booting screen 300 in the booting process P1. The booting screen 300 may provide various information to the user in the booting process P1. For example, the booting screen 300 may provide the various information such as a current temperature, a weather, a booting progress state, a warning content, and an notification content to the user.

[0218] That is, the controller 60 may control the screen outputter 8 to output the booting screen 300 and to provide the user with the various information related to the use of the laundry treating apparatus 1 via the booting screen 300.

[0219] In one example, the screen outputter 8 may output a course setting screen 400 via the display 84 in the course setting process P2. The course setting screen 400 may provide information regarding various courses and settings to the user, and the user may set the course, the option, and the like via the course setting screen 400.

[0220] For example, the controller 60 may control the screen outputter 8 such that the plurality of courses for treating the laundry are stored in advance, and a course selection screen 410 or the like for displaying the plurality of courses on the screen is output.

[0221] In addition, when the user manipulates the manipulator via the screen displayed on the display 84, the controller 60 may perform the laundry treatment process P3 depending on the course, the setting, or the like displayed on the display 84 based on the manipulation signal of the manipulator.

[0222] In one example, the screen outputter 8 may output a laundry treatment screen 500 via the display 84 in the laundry treatment process P3. The laundry treatment screen 500 may provide various information regarding the course currently in progress to the user.

[0223] For example, the controller 60 may control the screen outputter 8 to output the laundry treatment screen 500, and various information, such as a name of the course currently in progress, a duration of the course, a treatment process currently in progress in the corresponding course, a remaining time, and the like may be provided to the user on the laundry treatment screen 500.

[0224] In one example, FIG. 10 is a view schematically illustrating a notification screen 320 of the booting screen 300 output from the screen outputter 8 in one embodiment of the present disclosure.

[0225] In one embodiment of the present disclosure, the screen outputter 8 may provide various information to the user in a preparation process of each component of the laundry treating apparatus 1 via the booting screen 300. In one example, the booting screen 300 may include a plurality of screens that provide different information. In one embodiment of the present disclosure, the notification screen 320 illustrated in FIG. 10 may correspond to a portion of the booting screen 300.

[0226] Various information may be displayed on the notification screen 320 to be visually provided to the user. The notification screen 320 may display the various information, such as the current weather, the temperature, a water temperature, a remaining amount of the detergent, and the like, prior to the use of the laundry treating apparatus 1.

[0227] In one example, FIG. 11 is a view schematically illustrating the course selection screen 410 among the course setting screens 400 output on the screen outputter 8 in one embodiment of the present disclosure.

[0228] In one embodiment of the present disclosure, the course setting screen 400 output from the screen outputter 8 may include various screens such as the course selection screen 410. That is, the course selection screen 410 is a kind of the course setting screen 400 output from the screen outputter 8.

[0229] FIG. 11 illustrates the course selection screen 410 as an example of the course setting screen 400 according to one embodiment of the present disclosure. The course selection screen 410 may display the plurality of courses for treating the laundry, and one of the plurality of courses may be selected by the user.

[0230] The course selection screen 410 may include a sequence display area 411, a course name area, an option guidance area 413, and a function display area 405. The sequence display area 411 is an area that displays a sequence of a currently displayed course among the plurality of courses to be displayed to the user via the course selection screen 410.

[0231] In one embodiment of the present disclosure, the controller 60 may store the plurality of courses for treating the laundry in advance, and display the plurality of courses to the user via the screen outputter 8 to allow the user to directly select one of the plurality of courses.

[0232] However, the screen outputter 8 may display the information in the limited area via the display 84, and accordingly, simultaneously displaying the plurality of courses may be inefficient. Accordingly, according to one embodiment of the present disclosure, the plurality of courses may be sequentially displayed on the course selection screen 410, thereby effectively displaying the plurality of courses in the limited screen area.

[0233] According to the above circumstance, in one embodiment of the present disclosure, the course selection screen 410 may include the sequence display area 411 for notifying the user of the sequence of the currently displayed course, and the user may conveniently check, via the sequence display area 411, sequence information of the currently displayed course with respect to the plurality of courses.

[0234] FIG. 11 shows a state of indicating the sequence of the currently displayed course to the user as a plurality of circular objects respectively corresponding to the courses are displayed in the sequence display area 411 and a circular object corresponding to the currently displayed course has different illuminance than the remaining circular objects in the course selection screen 410. However, a specific shape of the sequence display area 411 may be determined in various ways that may indicate the sequence of the current course with respect to the plurality of courses.

[0235] In one example, a name of the course currently displayed on the course selection screen 410 may be displayed in the course name area. The user may identify the currently displayed course via the course name area.

[0236] An option setting value for the currently displayed course may be displayed in the option guidance area 413. As described above, a plurality of options may be set by the user for each of the plurality of courses, each option may have a plurality of option values that may be selected by the user, and one of the plurality of option values may be specified as an option setting value for the option and reflected in execution of the corresponding course.

[0237] According to one embodiment of the present disclosure, the option guidance area 413 of the course selection screen 410 may display the option setting values of the plurality of options for the corresponding course via the option guidance area 413 of the course selection screen 410 such that the user may conveniently identify a current option setting state for the corresponding course on the course selection screen 410 displaying the course.

[0238] In one example, a current function of the multi-function button 91 depending on the screen currently displayed on the screen outputter 8 may be displayed in the function display area 405. Accordingly, the user may conveniently and intuitively identify a result of the manipulation of the multi-function button 91 for each screen.

[0239] In one embodiment of the present disclosure, contents for indicating entry of an option recommendation screen may be displayed in the function display area 405 of the course selection screen 410, and detailed contents of the option recommendation screen will be described later.

[0240] According to one embodiment of the present disclosure, the plurality of areas are efficiently defined such that the various information may be effectively and conveniently transmitted to the user even in a limited output area size of the course selection screen 410.

[0241] In one example, in one embodiment of the present disclosure, the plurality of courses for treating the laundry may be stored in the controller 60, whether to specify each of the plurality of courses as a display group to be displayed in the course selection screen 410 may be set, and whether to specify each course as the display group may be changed by the user.

[0242] Referring to FIG. 11, a point area corresponding to each of the plurality of courses specified as the display group may be displayed in the sequence display area 411. The total number of point areas may be equal to the total number of courses of the display group, and a point area corresponding to the currently displayed course may be expressed via a difference in brightness.

[0243] The sequence display area 411 may be located

at an upper end of the display 84, and a selected course display area 412 may be located under the sequence display area 411. The selected course display area 412 may be located approximately at a center of the display 84.

[0244] The name of the currently displayed course may be displayed in the selected course display area 412, and may have the greatest character size in relationships with other areas, which secures visibility of the user.

[0245] The option guidance area 413 may be disposed under the selected course display area 412. The option guidance area 413 may be located at the center of the display 84 together with the selected course display area 412, and may be located under the selected course display area 412.

[0246] The option setting value of each of the plurality of options may be displayed in the option guidance area 413. The name of each of the plurality of options and the option setting value of each option may be displayed in the option guidance area 413.

[0247] Characters displayed in the option guidance area 413 may be displayed in a smaller size than the characters of the selected course display area 412, and may be displayed at a brightness lower than that of the characters of the selected course display area 412.

[0248] The function display area 405 may be disposed under the option guidance area 413. The function display area 405 may be located at a lower end of the display 84. Characters displayed in the function display area 405 may be displayed at a smaller size than the characters of the selected course display area 412.

[0249] In one example, FIG. 12 illustrates a course progress screen 510 among the laundry treatment screens 500 output from the screen outputter 8 in an embodiment of the present disclosure. That is, the course progress screen 510 corresponds to one of the laundry treatment screens 500, and FIG. 12 illustrates the course progress screen 510 as an example of the laundry treatment screen 500.

[0250] The user may identify the various information of the course for treating the laundry via the course selection screen 410 and the like of the screen outputter 8, and when one course is specified via the dial 56, the execution button 53b, and the like described above, the controller 60 may perform the course specified by the user based on the manipulation signal of the dial 56, the execution button 53b, and the like.

[0251] The plurality of courses for treating the laundry may include a standard washing course for washing the laundry, a standard drying course for drying the laundry, and the like, and when one of those is selected by the user, the controller 60 may control the water supply, the driver, the air supply, the drainage, and the like to perform the corresponding course.

[0252] As described above, in the laundry treatment process P3 of performing the corresponding course, the controller 60 may control the screen outputter 8 to output the course progress screen 510, and the controller 60 may provide various information to the user via the course progress screen 510.

[0253] Referring to FIG. 12, in one embodiment of the present disclosure, the course progress screen 510 may include a course display area, a time display area, a process display area, a completion level display area, and the function display area 405. However, a configuration of the course progress screen 510 may not be necessarily limited as described above, and may vary as necessary.

[0254] The course display area is an area that displays the name of the course being performed in the laundry treatment process P3. The user may identify the course currently in progress via the course display area.

[0255] The time display area is an area that displays an execution elapsed time or a remaining time of the course currently being performed. The user may conveniently identify an execution level or an end time of the course currently being performed via time information displayed in the time display area.

[0256] The process display area is an area that displays a current treatment process of the course that is currently being performed. In one embodiment of the present disclosure, the course for treating the laundry may include a plurality of treatment processes. For example, the standard washing course may include a water supply process, a detergent input process, a washing process, a rinsing process, a draining process, a dehydration process, and the like.

[0257] That is, in one embodiment of the present disclosure, when one course is performed, a plurality of treatment processes for the corresponding course may be performed. The controller 60 may display a treatment process currently in progress to the user via the process display area of the course progress screen 510, thereby allowing the user to secure intuitiveness for the laundry treatment process P3 and effectively identify the current treatment process.

[0258] In one example, the completion level display area is an area that displays a progress to date with respect to the entire course that is currently in progress. The completion level display area may convert a completion level into a percentage and display the completion level percentage or may display the completion level in a form of a bar as shown in FIG. 12.

[0259] According to one embodiment of the present disclosure, the user may simply and effectively identify the progress of the course currently in progress via the completion level display area. In addition, unlike the time display area that simply displays only the remaining time, the completion level display area that displays the current process among the entire processes of the course may provide convenience to the user.

[0260] In one example, the course progress screen 510 among the laundry treatment screens 500 may include the function display area 405 for displaying the function of the multi-function button 91 as in the course selection screen 410 described above. That is, the multi-function button 91 may be activated in the course

progress screen 510.

[0261] When the multi-function button 91 is activated, the multi-function button 91 itself or a portion of the screen outputter 8, for example, an edge of the multi-function button 91 may emit light to effectively express whether the multi-function button 91 is able to be used to the user.

[0262] In one example, FIG. 13 illustrates a reservation process of a course in the laundry treating apparatus 1 according to an embodiment of the present disclosure. FIG. 13A illustrates the course selection screen 410, FIG. 13B illustrates a reservation guidance screen 471 among the reservation screens 470, FIG. 13C illustrates a reservation time list 472 of the reservation screen 470, and FIG. 13D illustrates a reservation completion screen 473 among the reservation screens 470.

[0263] FIG. 14 is a view illustrating a state in which the function of the multi-function button 91 is changed depending on an item of the reservation time list 472 in an embodiment of the present disclosure. FIG. 14A illustrates a state in which one time item of the reservation time list 472 is an object to be selected, and FIG. 14B illustrates a state in which a reservation end item 4721 of the reservation time list 472 is the object to be selected.

[0264] Referring to FIGS. 13 and 14, in one embodiment of the present disclosure, the multi-function button 91 may be activated only in a state in which some of the plurality of objects are to be selected on the screen outputter 8.

[0265] First, as described above, the laundry treating apparatus 1 according to one embodiment of the present disclosure includes the cabinet 10, the drum 30, the manipulator, and the screen outputter 8. The drum 30 is disposed inside the cabinet 10, is disposed to be rotatable, and accommodates the laundry therein.

[0266] The manipulator is disposed on the cabinet 10 and is manipulated by the user to generate the manipulation signal. The screen outputter 8 is disposed on the cabinet 10 and outputs the screen for providing the information to the user.

[0267] The screen outputter 8 outputs the screen on which one of the plurality of objects is selected based on the manipulation signal, and the manipulator includes the multi-function button 91 activated only in the state in which some of the plurality of objects are to be selected on the screen outputter 8.

[0268] Specifically, the screen output from the screen outputter 8 may output the plurality of objects. The user may select one of the objects by manipulating the manipulator. FIG. 14 illustrates the screen outputter 8 in the state in which the plurality of time items are output as an example.

[0269] By rotating the dial 56 that surrounds the circumference of the screen outputter 8 and is rotatable, the user may locate an object-to-be-selected indicator on one of the plurality of objects to be selected.

[0270] The plurality of objects to be selected may correspond to, for example, the plurality of time items or the like included in the reservation time list 472 illustrated in FIG. 14.

[0271] In one embodiment of the present disclosure, in the screen outputter 8, when the plurality of objects to be selected are output on the screen, the object-to-be-selected indicator may be located on one of the plurality of objects to be selected on the screen.

[0272] The object-to-be-selected indicator is for displaying, to the user, an object on which selection of the corresponding object is to be made, based on the manipulation signal of the user among the plurality of objects to be selected, and the object on which the object-to-be-selected indicator is located among the plurality of objects to be selected may be displayed to be visually distinguished from the rest.

[0273] For example, referring to FIG. 14, the state in which object-to-be-selected indicator is located on one of the plurality of items included in the reservation time list 472 is shown. The object-to-be-selected indicator may have a difference in brightness or the like with respect to other items. However, a specific shape of the object-to-be-selected indicator may not be necessarily limited thereto, and the object-to-be-selected indicator may be implemented in various ways in which the user may recognize the object-to-be-selected indicator.

[0274] In one example, the object on which the object-to-be-selected indicator is located among the plurality of objects may be defined as the object to be selected. That is, in one embodiment of the present disclosure, when a confirmation signal of the user is input, the object to be selected on which the object-to-be-selected indicator is located among the plurality of objects may perform a subsequent procedure to be performed by the object to be selected.

[0275] For example, referring to FIG. 14B, when the user manipulates the multi-function button 91 and the like to input the confirmation signal to the controller 60 in the state in which the object-to-be-selected indicator is located on the reservation end item 4721 in the reservation time list 472 and the reservation end item 4721 is the object to be selected, the controller 60 may end the reservation process by the selection of the reservation end item 4721. The reservation screen 470 will be described in detail later.

[0276] In one example, in the state in which the plurality of objects are output on the screen outputter 8, the user may rotate the dial 56 to move the object-to-be-selected indicator from one of the plurality of objects to another, and accordingly, the user may select one of the plurality of objects and then proceed with the subsequent procedure.

[0277] In one example, in one embodiment of the present disclosure, as described above, the function of the multi-function button 91 may be changed depending on the screen output on the screen outputter 8, and may also be changed depending on the plurality of objects output on the screen.

[0278] The change of the function of the multi-function button 91 may include not only a case in which a reaction

of the controller 60 changes based on the manipulation of the multi-function button 91, but also a case in which the multi-function button 91 is activated or deactivated.

[0279] The multi-function button 91 may be activated for one item. Therefore, when the user manipulates the multi-function button 91, the controller 60 may perform the subsequent procedure based on the manipulation signal of the multi-function button 91.

[0280] However, the multi-function button 91 may be deactivated for another item. Accordingly, even though the multi-function button 91 is manipulated, the controller 60 may ignore the manipulation signal of the multi-function button 91, and further, the controller 60 may control the manipulator not to generate the manipulation signal even when the multi-function button 91 is manipulated by the user.

[0281] According to one embodiment of the present disclosure, the reaction of the controller 60 based on the manipulation signal of the multi-function button 91 is differently set depending on the screen output on the screen outputter 8, so that the user may conveniently transmit a command to the controller 60 on various screens using one multi-function button 91.

[0282] Furthermore, in one embodiment of the present disclosure, because the function of the multi-function button 91 is different depending on the item even on one screen output on the screen outputter 8, for example, because the multi-function button 91 is activated or deactivated depending on the item, an efficient utilization strategy of the multi-function button 91 may be established while excluding the unnecessary manipulation of the multi-function button 91.

[0283] Referring to FIGS. 13 and 14, in one embodiment of the present disclosure, the screen outputter 8 may output the reservation screen 470 in which a reservation time is set for the course for treating the laundry, the reservation time list 472 including the plurality of time items may be displayed on the reservation screen 470, and the multi-function button 91 may be activated only for some items of the reservation time list 472.

[0284] The reservation screen 470 may correspond to a kind of the course setting screen 400 that may be output from the screen outputter 8 in the course setting process P2. That is, the course setting screen 400 may further include the reservation screen 470 together with the course selection screen 410.

[0285] The reservation screen 470 may include a plurality of screens and configurations. The reservation screen 470 may include the reservation guidance screen 471 illustrated in FIG. 13B, may display the reservation time list 472 illustrated in FIG. 13C, and may include the reservation completion screen 473 illustrated in FIG. 13D.

[0286] The reservation time list 472 of the reservation screen 470 may include the plurality of time items. The plurality of time items may respectively correspond to the reservation times at which the course for treating the laundry is to be performed, and may correspond to different reservation times.

[0287] In the state in which the reservation time list 472 is displayed, the user may manipulate the dial 56 and the like to move the object-to-be-selected indicator displayed on the reservation time list 472 to an item desired by the user.

[0288] In one example, the user may manipulate the execution button 53b with respect to the item displayed as the object to be selected in the reservation time list 472, thereby instructing the controller 60 to perform the reservation process based on a reservation time displayed in the corresponding item.

[0289] In one example, the multi-function button 91 may be activated only for specific items among the plurality of items included in the reservation time list 472, and may be deactivated for the remaining items, so that the controller 60 may ignore the manipulation of the multi-function button 91.

[0290] In addition, as described above, when the multi-function button 91 is deactivated, the multi-function button 91 may turn off light. In one embodiment of the present disclosure, the screen outputter 8 or the multi-function button 91 may be constructed such that at least a portion, for example, the edge, of the multi-function button 91 may emit light.

[0291] When the multi-function button 91 is activated, the controller 60 may control the screen outputter 8 or the multi-function button 91 such that at least the portion of the multi-function button 91 emits light, and when the multi-function button 91 is deactivated, the controller 60 may control the screen outputter 8 or the multi-function button 91 such that at least the portion of the multi-function button 91 turns off the light.

[0292] According to one embodiment of the present disclosure, because the function of the multi-function button 91 may be changed not only for each screen, but also for each of the plurality of items displayed on one screen, complexity of use of the multi-function button 91 may be reduced.

[0293] In one example, the reservation time list 472 may include the reservation end item 4721 for ending the reservation screen 470, and the multi-function button 91 may be activated only in a state in which the reservation end item 4721 is to be selected.

[0294] According to one embodiment of the present disclosure, when the execution button 53b is manipulated for the plurality of time items displayed in the reservation time list 472, the controller 60 may perform a reservation process based on the corresponding time item.

[0295] As described above, one embodiment of the present disclosure may include the execution button 53b of the manipulator, and when the execution button 53b is manipulated in the course selection screen 410, the corresponding course may be performed.

[0296] One embodiment of the present disclosure provides consistency of the manner of manipulating the manipulator in the course selection on the course selection screen 410 and the reservation time selection on the res-

ervation screen 470, thereby providing convenience for the user in manipulating the plurality of buttons.

[0297] In one example, the reservation time list 472 of the reservation screen 470 may include the reservation end item 4721 together with the plurality of time items. FIG. 14B is a view illustrating the state in which the object-to-be-selected indicator is located on the reservation end item 4721 in the reservation time list 472 according to an embodiment of the present disclosure.

[0298] Even after entering the reservation screen 470, the user may want to cancel the reservation process and select and perform the course via the course selection screen 410, and thus, the reservation end item 4721 may be disposed in the reservation time list 472 of the reservation screen 470 to allow the user to end the reservation screen 470.

[0299] In one example, because the reservation end item 4721 is not an item for performing the reservation process unlike the time item, the reservation end item 4721 may be selectable by manipulating the multi-function button 91 unlike the time item so as to make differentiation to the user because of characteristics of the corresponding item.

[0300] That is, the controller 60 may activate the multi-function button 91 or respond to the manipulation signal of the multi-function button 91 only when the object-to-be-selected indicator is located on the reservation end item 4721 in the reservation time list 472 of the reservation screen 470.

[0301] As a result, according to one embodiment of the present disclosure, in the reservation time list 472, the time item is set to be selectable via the execution button 53b or the like and the reservation end item 4721 is set to be selectable via the multi-function button 91 to allow the user to conveniently and consistently recognize the usage of each button based on a difference between characteristics of the respective items.

[0302] In one example, the screen outputter 8 may display the item to be selected among the plurality of items included in the reservation time list 472 to be distinguished from the rest, and the item to be selected may be selected based on the manipulation signal.

[0303] As described above, in the reservation time list 472, the object-to-be-selected indicator may be located on one of the plurality of items, and the item to be selected may refer to the object to be selected on which the object-to-be-selected indicator is located.

[0304] In addition, as described above, the item on which the object-to-be-selected indicator is located may be displayed to be distinguished from the rest via a difference in brightness, color, or the like. The selection of the item to be selected may be completed by the manipulation signal of the manipulator, for example, the execution signal of the execution button 53b or the like.

[0305] In one example, the reservation screen 470 may include the function display area 405 that displays the function of the multi-function button 91, the function display area 405 may be output only in the state in which the reservation end item 4721 is to be selected in the reservation time list 472, and the function display area 405 may be removed in a state in which another item is to be selected.

[0306] The reservation screen 470 may include the above-described function display area 405. The function display area 405 corresponds to an area that displays the function of the multi-function button 91. Thus, in the reservation screen 470, the function display area 405 may be output on the screen only in the state in which the multi-function button 91 is activated.

[0307] That is, the screen outputter 8 may output the screen from which the function display area 405 is removed when the object-to-be-selected indicator is located on the time item in the reservation screen 470, and display the function display area 405 when the object-to-be-selected indicator is located on the reservation end item 4721.

[0308] When the function display area 405 is displayed only in a specific case, the function display area 405 may be displayed on the existing screen in a pop-up form.

[0309] In one embodiment of the present disclosure, the pop-up scheme means that a new screen is popping up and displayed on the existing screen. According to the pop-up scheme, it may be understood that the new screen is stacked in a form of a kind of layer on the existing screen.

[0310] That is, the function display area 405 may be displayed in the pop-up form on a portion of the reservation screen 470, and the reservation screen 470 may be displayed to overlap the function display area 405 in a state in which sharpness thereof is lowered in an area thereof overlapping the function display area 405.

[0311] FIG. 14A illustrates the reservation screen 470 from which the function display area 405 is removed as the object-to-be-selected indicator is located on the time item in one embodiment of the present disclosure, and FIG. 14B illustrates the reservation screen 470 in which the function display area 405 is displayed as the object-to-be-selected indicator is located on the reservation end item 4721.

[0312] Referring to FIG. 14B, the function display area 405 in the reservation screen 470 may be displayed in the pop-up format on the existing reservation screen 470, and may be located at the lower end of the display 84 so as to be located adjacent to the multi-function button 91 that may be located at a lower portion of the screen circumferential portion 849 of the screen outputter 8. The function display area 405 may be displayed to overlap the existing reservation time item in a form of a layer, and a transparency thereof may be set to provide a visual effect to the user.

[0313] The reservation end item 4721 may be displayed in various forms. Although shown in FIG. 14 in a form of a return arrow, a detailed display content of the reservation end item 4721 may be variously determined.

[0314] In one example, the screen outputter 8 may output the course selection screen 410 that selectively dis-

plays one of the plurality of courses for treating the laundry, and may be switched to the reservation screen 470 based on the manipulation signal of the manipulator in the state in which the course selection screen 410 is output.

[0315] FIG. 13A illustrates the course selection screen 410. One of the plurality of courses may be alternatively displayed on the course selection screen 410, and the user may manipulate the dial 56 or the like to change the course displayed on the course selection screen 410.

[0316] FIG. 13B illustrates the reservation guidance screen 471 that is output when the course selection screen 410 is switched to the reservation screen 470. A detailed description of the reservation guidance screen 471 will be made later.

[0317] FIG. 13C illustrates the reservation screen 470 switched from the course selection screen 410. As described above, the reservation screen 470 may display the reservation time list 472 including the plurality of time items.

[0318] The user may manipulate the manipulator on the course selection screen 410 shown in FIG. 13A to output the reservation screen 470 on the screen outputter 8. The reservation screen 470 may correspond to the reservation screen 470 for the course currently displayed on the course selection screen 410.

[0319] That is, the user may manipulate the dial 56 or the like of the manipulator to allow the course desired to be performed to be displayed on the course selection screen 410, and may manipulate the manipulator in the state in which the course desired to be performed is displayed on the course selection screen 410 to enter the reservation screen 470 for the corresponding course.

[0320] Specifically, in one embodiment of the present disclosure, the manipulator may further include the reservation button 250, and the screen outputter 8 may be switched to the reservation screen 470 when the reservation button 250 is manipulated while the course selection screen 410 is output.

[0321] The reservation button 250 may correspond to one of the above-described additional option buttons. For example, in one embodiment of the present disclosure, a plurality of additional option buttons may be disposed, and one of the plurality of additional option buttons may correspond to the reservation button 250.

[0322] That is, the user manipulate the reservation button 250 while the desired course is displayed on the course selection screen 410 of the screen outputter 8, thereby entering the reservation screen 470 for the corresponding course.

[0323] According to one embodiment of the present disclosure, because the reservation button 250 is disposed separately from the multi-function button 91 and the option button, the user may conveniently recognize and use the button for entering the reservation screen 470.

[0324] In one example, as described above, in one embodiment of the present disclosure, the screen outputter 8 may return to the course selection screen 410 when the multi-function button 91 is manipulated in the reservation screen 470 and the reservation end item 4721 is selected.

[0325] The course selection screen 410, which is returned from the reservation screen 470 as the reservation is cancelled, may display the course that was displayed on the course selection screen 410 immediately before the course selection screen 410 is switched into the reservation screen 470.

[0326] In one example, in one embodiment of the present disclosure, the multi-function button 91 may have different functions on the course selection screen 410 and on the reservation screen 470. That is, in one embodiment of the present disclosure, the multi-function button 91 may not only have a different function for each item of the reservation time list 472, but also have the different functions on the course selection screen 410 and on the reservation screen 470.

[0327] Specifically, in one embodiment of the present disclosure, the multi-function button 91 may have an option recommendation function on the course selection screen 410. According to one embodiment of the present disclosure, an option combination in which option setting values recommended to the user are set may be stored in the controller 60 for each course, and when the multi-function button 91 is manipulated on the course selection screen 410, an option recommendation screen for recommending an option combination of the currently displayed course to the user may be output.

[0328] The course selection screen 410 may output the function display area 405 including an indication notifying the user that the multi-function button 91 has the option recommendation function.

[0329] In one embodiment of the present disclosure, the multi-function button 91 may have the option recommendation function on the course selection screen 410, and may be deactivated or have a reservation end function on the reservation screen 470.

[0330] According to one embodiment of the present disclosure, because the multi-function button 91 has the option recommendation function on the course selection screen 410, the reservation button 250 may be disposed instead of the multi-function button 91 to output the reservation screen 470 on the course selection screen 410, and the user may manipulate the multi-function button 91 on the course selection screen 410 to output the option recommendation screen or manipulate the reservation button 250 to output the reservation screen 470.

[0331] The function display area 405 will be described mainly. In one embodiment of the present disclosure, each of the course selection screen 410 and the reservation screen 470 includes the function display area 405 that displays the function of the multi-function button 91, and function display area 405 of the course selection screen 410 and the function display area 405 of the reservation screen 470 may display the different functions.

[0332] That is, the function display area 405 of the

course selection screen 410 may have the indication notifying the option recommendation function of the multi-function button 91. The function display area 405 of the reservation screen 470 may be removed from the screen in the state in which the time item is the object to be selected, but may be displayed on the screen and have an indication indicating the reservation end function of the multi-function button 91 in the state in which the reservation end item 4721 is the object to be selected.

[0333] In one example, in one embodiment of the present disclosure, when the multi-function button 91 is manipulated on the course selection screen 410, the screen outputter 8 may be switched to the option recommendation screen that displays the option combination recommended for the course displayed on the course selection screen 410.

[0334] A plurality of option combinations may be stored in the controller 60, and option setting values of at least some of the plurality of options may be set differently in the plurality of option combinations.

[0335] That is, in one embodiment of the present disclosure, one option combination may include respective option setting values for the plurality of options, and the plurality of different option combinations may be stored in the controller 60. In the plurality of option combinations, different option setting values may be set for at least one option.

[0336] According to one embodiment of the present disclosure, the option combination is recommended to the user in the course selection process to improve use convenience, and the plurality of option combinations may be provided to provide various option combinations to the user.

[0337] A scheme in which the plurality of option combinations are suggested to the user via the option recommendation screen may be equal to or similar to the scheme in which the plurality of courses are provided to the user on the course selection screen 410.

[0338] For example, one of the plurality of option combinations may be alternatively displayed on the option recommendation screen, and the user may rotate the dial 56 such that the plurality of option combinations are sequentially displayed on the screen.

[0339] Specifically, in one embodiment of the present disclosure, the multi-function button 91 may have the option recommendation function in the state in which the course selection screen 410 is output on the screen outputter 8.

[0340] That is, when the manipulation signal of the multi-function button 91 is generated while the course selection screen 410 is output, the controller 60 may control the screen outputter 8 to output the option recommendation screen for recommending the option combination to the user.

[0341] The course selection screen 410 may include the function display area 405 for displaying the function of the multi-function button 91, and a phrase indicating the option recommendation function in which the option combination is recommended when the multi-function button 91 is manipulated may be displayed in the function display area 405.

[0342] For reference, in FIG. 11, a byname of the option recommendation function called a "master card" is displayed in the function display area 405. In addition, the phrase indicating the option recommendation function may be variously determined as necessary.

[0343] When the multi-function button 91 is manipulated on the course selection screen 410, the screen output on the area of the display 84 of the screen outputter 8 may be switched from the course selection screen 410 to the option recommendation screen.

[0344] The option recommendation screen may include the course display area, an option combination area, and the function display area 405.

[0345] A phrase indicating the course displayed on the course selection screen 410 may be displayed in the course display area. For example, the name of the course may be displayed in the course display area. The user may conveniently identify a target course of the option combination currently being recommended via the course display area.

[0346] The plurality of option combinations may be alternatively displayed in the option combination area. A scheme of displaying the plurality of option combinations in the option combination area is similar to the scheme of displaying the plurality of courses on the course selection screen 410.

[0347] That is, one of the plurality of option combinations may be displayed in the option combination area, and the user may manipulate the dial 56 and the like to change the option combination displayed in the option combination area to another option combination and identify the changed option combination.

[0348] In addition, an option combination group applicable for each course among the plurality of option combinations may be preset, and only option combinations corresponding to an option combination group applicable to the course displayed in the course display area may be displayed in the option combination area on the option recommendation screen.

[0349] In one example, various information on a currently displayed option combination may be displayed in the option combination area. For example, a name of an option combination and an option setting value of each option included in the corresponding option combination may be displayed in the option combination area.

[0350] In one example, the option recommendation screen may include the function display area 405 for displaying the function of the multi-function button 91 as in the course selection screen 410. On the option recommendation screen, the multi-function button 91 may have an end function for ending the option recommendation screen, and a phrase for indicating the end function of the multi-function button 91 may be displayed in the function display area 405.

[0351] In one example, when the course selection

screen 410 is switched to the reservation screen 470, the screen outputter 8 may output the reservation screen 470 after outputting the reservation guidance screen 471 that displays use information of the reservation screen 470 to the user. The reservation guidance screen 471 may be output in the pop-up form for a predetermined time on the reservation screen 470.

[0352] Specifically, according to one embodiment of the present disclosure, to indicate that the user is able to proceed with the reservation process via the reservation screen 470 switched from the course selection screen 410, the reservation guidance screen 471 may be disposed on the reservation screen 470 at the same time that the course selection screen 410 is switched to the reservation screen 470.

[0353] As shown in FIG. 13B, the reservation guidance screen 471 may display contents for illustrating the reservation process or a method of progress of the reservation process. The reservation guidance screen 471 may be displayed in the pop-up form on the reservation screen 470 on which the above-described reservation time list 472 is displayed. The reservation guidance screen 471 may be output in an entire area of the display 84 or may be output only in a partial area.

[0354] In one example, in one embodiment of the present disclosure, the manipulator may further include the execution button 53b that generates an execution signal of the course, and the screen outputter 8 may output the reservation completion screen 473 that indicates completion of the reservation of the corresponding course when the execution signal is generated in the reservation screen 470.

[0355] That is, the user may manipulate the execution button 53b while one of the plurality of time items is selected in the reservation screen 470, thereby completing the reservation process as the corresponding reservation time is applied to the corresponding course.

[0356] According to one embodiment of the present disclosure, the controller 60 may complete the reservation process of the corresponding course to which the corresponding reservation time is applied when the execution button 53b is manipulated in the reservation screen 470 so as to maintain consistency with the manner in which the currently displayed course is performed as the execution button 53b is pressed on the course selection screen 410.

[0357] In one example, in one embodiment of the present disclosure, the reservation completion screen 473 may include a reserved course display area 4731 that displays the reserved course, a reservation time display area 4732 that displays the time reserved via the reservation screen 470, and a reservation state display area 4733 that indicates a current progress state.

[0358] Referring to FIG. 13D, when the execution button 53b is manipulated for one time item on the reservation screen 470, the reservation completion screen 473 may be output from the screen outputter 8, and a course that is a target of the reservation process may be displayed in the reserved course display area 4731 of the reservation completion screen 473.

[0359] For example, the reserved course display area 4731 may display the name of the course that was displayed in the course selection screen 410 before entering the reservation screen 470. The user may easily identify the course currently set by himself/herself via the reserved course display area 4731.

[0360] The reservation time selected via the reservation screen 470 may be displayed in the reservation time display area 4732. For example, the reservation time display area 4732 may display a remaining time until the reserved course is performed from a current time point at which the reservation has been completed.

[0361] A phrase indicating that the reservation of the course for treating the laundry has been completed may be displayed in the reservation state display area 4733. The user may conveniently identify that the current state of the laundry treating apparatus 1 is the state in which the reservation of the course for treating the laundry has been completed via the reservation state display area 4733.

[0362] In one example, the function display area 405 may be displayed on the reservation completion screen 473. That is, the multi-function button 91 may be activated on the reservation completion screen 473, and the controller 60 may perform a preset process when the multi-function button 91 is manipulated on the reservation completion screen 473.

[0363] In one embodiment of the present disclosure, the multi-function button 91 may have a laundry addition function while the reservation completion screen 473 is output on the screen outputter 8. That is, when the multi-function button 91 is manipulated by the user in the state in which the reservation completion screen 473 is output on the screen outputter 8, the controller 60 may perform a laundry addition process. The laundry addition process will be described in detail later.

[0364] In one example, as described above, the screen outputter 8 may include the display 84 on which the screen is output and the screen circumferential portion 849 that surrounds the display 84, and the multi-function button 91 may be disposed in the screen circumferential portion 849. For example, the multi-function button 91 may be disposed on the screen circumferential portion 849 below the display 84.

[0365] The screen outputter 8 may protrude from the cabinet 10, and the manipulator may further include the dial 56. The dial 56 may surround the outer circumferential surface of the screen outputter 8 and may be rotatable, and may be manipulated by the user to change the object to be selected among the plurality of objects displayed on the screen.

[0366] In one example, FIG. 15 illustrates a state in which a phrase indicating the laundry addition function of the multi-function button 91 is displayed in the function display area 405 of the course selection screen 410 according to an embodiment of the present disclosure.

[0367] FIG. 15A illustrates a state in which the course currently in progress is in a washing process and the multi-function button 91 is activated to have the laundry addition function, and FIG. 15B illustrates a state in which the course is in a dehydration process and the multi-function button 91 is deactivated.

[0368] According to one embodiment of the present disclosure, the screen outputter 8 may output the course progress screen 510 that displays execution information of the course for treating the laundry, and the manipulator may be activated in at least some of the plurality of processes performed in the course and include the multi-function button 91 for performing the laundry addition process for additionally inputting the laundry while the course is in progress when being manipulated by the user in the activated state.

[0369] The laundry addition process may refer to a process for adding the laundry during the process currently in progress. For example, in the state in which the course selected by the user is in progress, when it is to add the laundry to be treated based on an intention of the user, the user may command the controller 60 to perform the laundry addition process via the manipulation of the manipulator, and the controller 60 may perform control in which the laundry may be added into the drum 30 during the laundry addition process.

[0370] In one embodiment of the present disclosure, the plurality of courses for treating the laundry may be stored in the controller 60, and one of the plurality of courses may be selected by the user on the course selection screen 410.

[0371] After the course is selected by the user, the laundry treatment process P3 in which the laundry is treated via the course may be performed. In the laundry treatment process P3, the plurality of processes included in the corresponding course may be sequentially performed.

[0372] For example, in one embodiment of the present disclosure, the plurality of courses stored in advance in the controller 60 may include the standard washing course for removing contaminants from the laundry, and the standard washing course may include a water supply process, a soaking process, a washing process, a dehydration process, and the like, and may further include a reservation standby process when the reservation process is performed by the user.

[0373] In the plurality of processes included in one course, a process in which the laundry may be added may be set in advance in a divided manner in the controller 60. For example, in the dehydration process in which the drum 30 rotates at a high speed and the washing treatment of the laundry has been performed sufficiently, the laundry addition process may be set as unavailable, and in the washing process in which the laundry is still being washed, the laundry addition process may be set as available.

[0374] When it is determined that the process currently in progress of the course being performed in the laundry treatment process P3 is the laundry addition process, the controller 60 may activate the laundry addition function of the multi-function button 91 and output the function display area 405 on the course progress screen 510 via the screen outputter 8 to notify the user that the laundry addition function may be used.

[0375] According to one embodiment of the present disclosure, whether the laundry addition process is able to be performed may be set in advance in the controller 60 for each of the plurality of processes included in the course for treating the laundry, and accordingly, the laundry addition function may be provided in an appropriate process to the user in consideration of use safety and efficiency of course execution.

[0376] Furthermore, when the laundry addition process is able to be performed, the controller 60 may activate the multi-function button 91 and output the function display area 405 that displays the laundry addition function of the multi-function button 91 on the course progress screen 510 via the screen outputter 8, thereby effectively notifying the user that the laundry addition function is able to be used.

[0377] That is, in one embodiment of the present disclosure, the course progress screen 510 may include the function display area 405 indicating that the multi-function button 91 is activated and the laundry addition process is available.

[0378] FIG. 15A illustrates the course progress screen 510 that displays the laundry addition function of the multi-function button 91 via the function display area 405. However, a specific indication or a phrase for indicating the laundry addition function may be variously determined as necessary.

[0379] In one example, referring to FIG. 15A, the course progress screen 510 may further include an executed course display area 511 that displays the currently executed course, an execution time display area 512 that displays time information of the currently executed course, an executed process display area 513 that displays the process currently executed in the course, and an execution completion level display area 514 that displays a completion level of the currently executed course.

[0380] As described above, the course currently in progress may be displayed on the executed course display area 511, and the user may easily recognize the course currently in progress via the course name or the like displayed on the executed course display area 511.

[0381] The execution time display area 512 may display an execution elapsed time, an execution remaining time, or the like of the course currently in progress, and the user may effectively identify the execution progress or the remaining time of the course currently in progress via the time information displayed in the execution time display area 512.

[0382] In the executed process display area 513, the process currently in progress among the plurality of processes included in the course currently in progress may be displayed, and the user may identify the current laun-

dry treatment process P3 via a process name or the like displayed in the executed process display area 513.

[0383] A completion level to date in the entire processes of the course currently in progress may be displayed in the execution completion level display area 514, and the user may intuitively identify how far the current laundry treatment process P3 has progressed via the execution completion level display area 514.

[0384] In one example, in one embodiment of the present disclosure, the function display area 405 may be removed from the course progress screen 510 during progress of the process in which the laundry addition process is not able to be applied among the plurality of processes.

[0385] That is, the course progress screen 510 may output the function display area 405 when the laundry addition process is able to be performed in the process currently in progress, and remove the function display area 405 when the laundry addition process is not able to be performed.

[0386] FIG. 15A illustrates a state in which the function display area 405 is displayed in the washing process of the standard washing course according to an embodiment of the present disclosure, and FIG. 15B illustrates a state in which the function display area 405 is removed in the dehydration process of the standard washing course.

[0387] The output and removal-related features of the function display area 405 may be similar to the output and removal-related features of the function display area 405 on the above-described reservation screen 470.

[0388] That is, the screen outputter 8 may display the function display area 405 in the state in which the process in which the laundry addition process is able to be performed is in progress on the course progress screen 510, and may output the screen from which the function display area 405 is removed in the state in which the process in which the laundry addition process is not able to be performed is in progress. The function display area 405 may be displayed in the pop-up form on the existing screen.

[0389] That is, in one embodiment of the present disclosure, the multi-function button 91 may be activated when the process for treating the laundry currently in progress in the laundry treatment process P3 is able to perform the laundry addition process and may be deactivated otherwise.

[0390] That is, the controller 60 may activate the multi-function button 91 when the process currently in progress is able to perform the laundry treatment process P3, and may deactivate the multi-function button 91 otherwise.

[0391] In one example, FIG. 16 is a view illustrating a screen change of the screen outputter 8 based on the laundry addition process. FIG. 16A illustrates the course progress screen 510 before the laundry addition function is executed, FIG. 16B illustrates a laundry addition guidance screen 521 output when the laundry addition function is executed, and FIG. 16C illustrates a pause screen 520 output on the screen outputter 8 in the laundry addition process.

[0392] In one embodiment of the present disclosure, when the activated multi-function button 91 is manipulated on the course progress screen 510, the screen outputter 8 may be switched to the pause screen 520 displaying a paused state of the course.

[0393] That is, in one embodiment of the present disclosure, the controller 60 may enter the paused state when the laundry addition process is performed in the laundry treatment process P3, and the screen outputter 8 may output the pause screen 520 when the laundry addition function is input by the user on the course progress screen 510.

[0394] According to one embodiment of the present disclosure, when the process currently in progress is able to perform the laundry addition process, and when the multi-function button 91 is manipulated by the user and the laundry addition function is input, the paused state may be maintained until it is input, via manipulation of the manipulator by the user, that the addition of the laundry is completed.

[0395] That is, in one embodiment of the present disclosure, when the laundry addition process is performed while the course in in progress, the controller 60 may enter the paused state and allow the user to add the laundry into the drum 30, and when the user adds the laundry and generates the manipulation signal, may perform the process that was performed immediately before the laundry addition process.

[0396] When the course progress screen 510 is switched to the pause screen 520, the screen outputter 8 may output the pause screen 520 after outputting the laundry addition guidance screen 521 illustrating the laundry addition process.

[0397] Referring to FIG. 16B, the screen outputter 8 may output the laundry addition guidance screen 521 for illustrating the progress of the laundry addition process to the user. The laundry addition guidance screen 521 may correspond to a portion of the pause screen 520, and may be displayed in the pop-up form on the pause screen 520.

[0398] The laundry addition guidance screen 521 may maintain an output state for a time preset in the controller 60 and then be automatically removed from the area of the display 84. The laundry addition guidance screen 521 may be displayed in the pop-up form in an entirety or the portion of the pause screen 520.

[0399] That is, the laundry addition guidance screen 521 may be output in the pop-up form for the preset time on the pause screen 520.

[0400] In one example, when the laundry addition process is ended, the screen outputter 8 may return to the course progress screen 510 from the pause screen 520. That is, the screen outputter 8 may maintain the pause screen 520 shown in FIG. 16C in the laundry addition process and then return to the course progress screen 510 shown in FIG. 16A in response to the manipulation

signal by the user, and the controller 60 may resume the process that was progressed immediately before the paused state.

[0401] According to one embodiment of the present disclosure, the course may be performed while controlling the rotation of the drum 30, whether the laundry addition process is able to be applied may be set for each of the plurality of processes, and the multi-function button 91 may be activated in the state in which the process in which the laundry addition process is able to be applied is performed.

[0402] In one example, one embodiment of the present disclosure may include the tub 20 described above. The tub 20 may be disposed in the cabinet 10, the drum 30 may be rotatably installed in the tub 20, and water may be received in the tub 20.

[0403] When the laundry addition process is performed, the controller 60 may perform the draining process of discharging water in the tub 20 to the outside of the cabinet 10. That is, when the laundry treatment process P3 is performed, the controller 60 may perform the draining process of discharging water present in the tub 20 to the outside.

[0404] In the draining process, the water inside the tub 20 may be completely removed, or the water may be drained to an extent that the water does not leak to the outside of the cabinet 10 via the laundry inlet 17 even when the laundry door 40 is opened to add the laundry.

[0405] When the draining process is completed, the controller 60 may notify the user that current state is a state in which the laundry may be added via the screen outputter 8 or the like. For example, the controller 60 may control the screen outputter 8 such that the display 84 displays the state in which the draining process is ended and the laundry is able to be added.

[0406] Alternatively, a sound outputter that is included in the screen outputter 8 or is disposed separately from the screen outputter 8 to output sound may be disposed, and the controller 60 may control the sound outputter to transmit a sound signal for notifying the user that the laundry is able to be added.

[0407] In one example, in one embodiment of the present disclosure, the controller 60 may discharge water in the tub 20 in the draining process such that an amount of water in the tub 20 is equal to or smaller than a preset reference water amount.

[0408] As described above, one embodiment of the present disclosure may correspond to the front loader type in which the laundry inlet 17 and the laundry door 40 are defined in and disposed on the front panel 15, and thus, when the user opens the laundry door 40 without the draining process, water inside the tub 20 may leak to the outside.

[0409] Accordingly, the controller 60 may discharge water in the tub 20 in the draining process such that the amount of water in the tub 20 is equal to or smaller than the preset reference water amount, and the reference water amount may correspond to a setting value at which water may not leak via the tub opening 22 from the inside of the tub 20.

[0410] In one example, the cabinet 10 may have the laundry inlet 17 defined therein in communication with the inside of the drum 30, the cabinet 10 may have the laundry door 40 that is to open and close the laundry inlet 17, and the controller 60 may release a locked state of the laundry door 40 when the draining process is ended in the laundry addition process.

[0411] Specifically, in one embodiment of the present disclosure, the laundry door 40 may include an opening/closing control device, and the controller 60 may control the opening/closing control device to control whether the laundry door 40 is opened or closed by the user.

[0412] That is, when the opening/closing control device is controlled to be locked by the controller 60, the user is not able to open the laundry door 40 even when the user manipulates the laundry door 40. When the opening/closing control device is controlled to be released by the controller 60, the user is able to arbitrarily open and close the laundry door 40 by manipulating the laundry door 40.

[0413] When the user arbitrarily opens the laundry door 40 while the course is in progress, water and the laundry inside the rotating drum 30 may be discharged to the outside of the cabinet 10, and when the user and the drum 30 are in contact with each other, injury of the user, damage to the drum 30, and the like may occur, and thus a safety problem may occur.

[0414] Accordingly, in one embodiment of the present disclosure, the controller 60 may control the opening/closing control device to be locked in the laundry treatment process P3 in which the course is performed, thereby preventing the laundry door 40 from being opened to secure the safety.

[0415] However, because the opening of the laundry door 40 is essential to add the laundry in the laundry addition process, the controller 60 may control the opening and closing control device to be released after the draining process is ended, thereby allowing the user to open the laundry door 40.

[0416] In one example, the manipulator may further include the execution button 53b for instructing the controller 60 to perform the course, and the controller 60 may resume the course when the execution button 53b is manipulated after the door release process in the laundry addition process.

[0417] As described above, according to one embodiment of the present disclosure, the user may utilize the execution button 53b to input an execution command of the course or complete the reservation process not only on the course selection screen 410 but also on the reservation screen 470, so that consistency of each button of the manipulator may be maintained.

[0418] Furthermore, when the execution signal of the execution button 53b is input in the paused state, the controller 60 may end the laundry addition process and resume the course for treating the laundry, thereby pro-

viding the user with the consistency with respect to the function of the execution button 53b.

[0419] In one example, as described above, the controller 60 may store the plurality of courses, the screen outputter 8 may display the plurality of courses and output the course selection screen 410 on which one of the plurality of courses is selected based on the manipulation signal, and the controller 60 may control the course displayed on the course selection screen 410 to be performed when the execution button 53b is manipulated on the course selection screen 410, and control the course progress screen 510 to be output.

[0420] The function of the multi-function button 91 may be changed depending on the screen output from the screen outputter 8, and the screen outputter 8 may output the option recommendation screen that displays the recommended option combination for the course displayed on the course selection screen 410 when the multi-function button 91 is manipulated while the course selection screen 410 is output.

[0421] In addition, as described above, in one embodiment of the present disclosure, while the course progress screen 510 is output on the screen outputter 8, the multi-function button 91 may be activated in the washing process of the course and may be deactivated in the dehydration process of the course.

[0422] In one example, FIG. 21 shows a flowchart of a control method for performing a laundry addition process according to an embodiment of the present disclosure. Referring to FIG. 21, the method for controlling the laundry treating apparatus 1 for performing the laundry addition process according to an embodiment of the present disclosure will be described as follows.

[0423] One embodiment of the present disclosure may include laundry addition determination (S1 10), button function locking, and laundry addition function activation. In addition, laundry addition function display (S130) may be further included after the laundry addition function activation (S120).

[0424] In detail, in the laundry addition determination (S 110), the controller 60 may perform the course for treating the laundry, and may determine whether the laundry addition process for additionally inputting the laundry is able to be performed in the course currently in progress depending on the course.

[0425] In the button function locking (S115), when it is determined in the laundry addition determination (S110) that it is not able to perform the laundry addition process in the process currently in progress, the controller 60 may deactivate the multi-function button 91 that is disposed on the cabinet 10 and manipulated by the user.

[0426] In the laundry addition function activation (S120), when it is determined in the laundry addition determination (S110) that the laundry addition process is able to be performed in the process currently in progress, the controller 60 may activate the multi-function button 91.

[0427] In the laundry addition function display (S130), the controller 60 may control the screen outputter 8 for providing the information to the user to display the function of the multi-function button 91 to notify the user that the laundry is able to be added. The flowchart in FIG. 21 illustrates that the laundry addition function display (S130) is performed after the laundry addition function activation (S120) is performed, but, when necessary, the laundry addition function activation (S120) may be performed simultaneously with the laundry addition function display (S130) or may be performed after the laundry addition function display (S130).

[0428] In laundry addition signal determination (S140), the controller 60 may determine whether the input signal for performing the laundry addition function is generated as the multi-function button 91 is manipulated by the user.

[0429] In laundry addition guidance (S150), the controller 60 may control the screen outputter 8 to output the laundry addition guidance screen 521 on the pause screen 520, and the laundry addition guidance screen 521 may be removed without the manipulation signal after being displayed only for a preset time.

[0430] In draining (S160) for adding the laundry, when water presents inside the tub 20, the controller 60 may control the drainage to discharge water in the tub 20 such that the amount of water inside the tub 20 is equal to or smaller than the preset reference water amount.

[0431] However, when there is no water inside the tub 20, for example, when the process currently in progress is the reservation standby process that has passed through the reservation screen 470, the draining (S 160) for adding the laundry may be omitted.

[0432] In laundry door unlocking (S170), the controller 60 may control the opening/closing control device of the laundry door 40 to be released to allow the laundry door 40 to be opened by the user in the state in which the water in the tub 20 is drained such that the amount of water is equal to or smaller than the reference water amount through the draining (S160) for adding the laundry. The controller 60 may provide, via the screen outputter 8 or the sound outputter, visual information or auditory information for notifying the user that the laundry is able to be added.

[0433] In execution signal determination (S180), the controller 60 may standby in the paused state, and may determine whether the execution signal is input as the execution button 53b is manipulated by the user.

[0434] In the course resume (S190), when it is determined in the execution signal determination (5180) that the execution signal is input, the controller 60 may return to the state before the laundry addition process is performed and resume the corresponding process of the course that was performed in the laundry treatment process P3.

[0435] In one example, FIG. 18 shows a state in which a course cancellation screen 530 is displayed on the screen outputter 8 based on a course cancellation process in an embodiment of the present disclosure. FIG. 18A illustrates the course progress screen 510, FIG. 18B

illustrates the course cancellation screen 530, and FIG. 18C illustrates a course cancellation guidance screen.

[0436] The course cancellation process of the present disclosure will be described with reference to FIG. 18.

[0437] First, as described above, one embodiment of the present disclosure includes the drum 30, the screen outputter 8, the multi-function button 91, and the controller 60. The drum 30 may be disposed inside the cabinet 10, may be disposed to be rotatable, and may accommodate the laundry therein.

[0438] The screen outputter 8 may be disposed on the cabinet 10 and may output the screen for providing the information to the user. The multi-function button 91 may be disposed on the cabinet 10, and the function of the multi-function button 91 may be changed depending on the screen output on the screen outputter 8.

[0439] The controller 60 may control the rotation of the drum 30 and perform the course for treating the laundry. The screen outputter 8 may output the pause screen 520 indicating that the course is paused while being in progress, and the controller 60 may perform the course cancellation process of cancelling the currently paused course when the multi-function button 91 is manipulated while the screen outputter 8 outputs the pause screen 520.

[0440] According to one embodiment of the present disclosure, when the course selected via the course selection screen 410 is performed, the course progress screen 510 for indicating the execution process of the course may be output on the screen outputter 8.

[0441] In addition, the controller 60 may enter the paused state for temporarily stopping the course currently in progress based on the manipulation signal of the user in the laundry treatment process P3, and the screen outputter 8 may output the pause screen 520 on the display 84 in the paused state.

[0442] In one example, when the multi-function button 91 is manipulated in the paused state, the controller 60 may perform the course cancellation process for cancelling the course that is stopped by the current paused state.

[0443] In one embodiment of the present disclosure, there may be various schemes for entering the paused state. For example, as described above, when the multi-function button 91 is manipulated on the course progress screen 510 and the laundry addition process is performed, the paused state may be entered. The paused state may be entered in the laundry addition process such that the user may safely add the laundry.

[0444] In one example, when the user manipulates the button 53b on the course progress screen 510, the controller 60 may enter the paused state. The paused state based on the execution signal of the execution button 53b may correspond to a situation in which the user is to pause the course for various reasons.

[0445] In one example, the user may want to cancel the corresponding course for various reasons while the course is in progress. For example, the user may desire to progress the laundry treatment course again later and may desire to change to a course other than the course currently in progress.

[0446] According to one embodiment of the present disclosure, the user may effectively stop the laundry treatment process P3 as needed using the execution button 53b or the like, and the user may conveniently cancel the corresponding laundry treatment process P3 by manipulating the multi-function button 91 in the paused state.

[0447] In one example, as described above in the laundry addition process, the controller 60 may resume the laundry treatment process P3 that was performed immediately before when the execution button 53b is manipulated in the paused state.

[0448] That is, the user may manipulate the execution button 53b on the pause screen 520 to resume the laundry treatment process P3 again, or may manipulate the multi-function button 91 to cancel the course.

[0449] According to one embodiment of the present disclosure, the plurality of buttons, such as the execution button 53b and the multi-function button 91, may be utilized by the user in the paused state, thereby improving a degree of freedom of selection of selecting or cancelling the course in the paused state.

[0450] In one example, in one embodiment of the present disclosure, the execution button 53b may be disposed on the cabinet 10 and may be manipulated by the user to generate execution and stop signals of the course.

[0451] The screen outputter 8 may output the course progress screen 510 that displays the progress state of the course, and may be switched to the pause screen 520 when the execution button 53b is manipulated on the course progress screen 510.

[0452] That is, in one embodiment of the present disclosure, when the execution button 53b is manipulated in the course setting process P2, the controller 60 may perform the laundry treatment process P3 based on the corresponding course. When the execution button 53b is manipulated in the laundry treatment process P3, the controller 60 may enter the paused state for the corresponding laundry treatment process P3. Further, when the execution button 53b is manipulated in the paused state, the controller 60 may resume the laundry treatment process P3 that was performed before the paused state.

[0453] In one example, FIG. 17 illustrates the state in which the function of the multi-function button 91 displayed in the function display area 405 is changed depending on the screen output on the screen outputter 8. FIG. 17A illustrates the function display area 405 in which the laundry addition function of the multi-function button 91 is displayed on the course progress screen 510, and FIG. 17B illustrates the function display area 405 in which the course cancellation function of the multi-function button 91 is displayed on the pause screen 520.

[0454] Referring to FIGS. 17A and 17B, in one embodiment of the present disclosure, the controller 60 may deactivate the function of the multi-function button 91 on

the course progress screen 510 or may change the function of the multi-function button 91 into the laundry addition function for adding the laundry while the course is in progress, and may change the function of the multi-function button 91 to the course cancellation function for cancelling the course on the pause screen 520.

[0455] That is, on the course selection screen 410, the multi-function button 91 may have the option recommendation function. On the course progress screen 510, the multi-function button 91 may have the laundry addition function when the laundry addition process is able to be performed in the course currently in progress, and may be deactivated when the laundry addition process is not able to be performed. Further, on the pause screen 520, the multi-function button 91 may have the course cancellation function.

[0456] In one embodiment of the present disclosure, the function change of the multi-function button 91 may eventually correspond to a change in the execution of the controller 60 based on the manipulation signal of the multi-function button 91. That is, on the course selection screen 410, the controller 60 may perform the option recommendation process when the manipulation signal of the multi-function button 91 is input. Further, on the course progress screen 510, the controller 60 may perform the laundry addition process based on the manipulation signal of the multi-function button 91 or ignore the manipulation signal. further on the pause screen 520, the controller 60 may perform the course cancellation process when the manipulation signal of the multi-function button 91 is input.

[0457] According to one embodiment of the present disclosure, as the function of the multi-function button 91 is variously changed depending on the screen output from the screen outputter 8, the user may input various commands to the controller 60 via the single button, and the controller 60 may also perform various operations based on the manipulation signal generated from the single button.

[0458] In one example, in one embodiment of the present disclosure, the pause screen 520 may include the function display area 405 that displays the course cancellation function of the multi-function button 91. The function display area 405 may include an indication for indicating the course cancellation function of the multi-function button 91.

[0459] As described above, when the multi-function button 91 is activated, the screen outputter 8 may output the function display area 405 that displays the function of the multi-function button 91 on the screen, and when the multi-function button 91 is deactivated, the screen outputter 8 may remove the function display area 405.

[0460] On the course selection screen 410, the function display area 405 that indicates the option recommendation function of the multi-function button 91 may be displayed. On the course progress screen 510, the function display area 405 that indicates the laundry addition function of the multi-function button 91 may be displayed or removed for each process currently in progress of the course performed in the laundry treatment process P3. Further, on the pause screen 520, the function display area 405 that indicates the course cancellation function of the multi-function button 91 may be displayed.

[0461] According to one embodiment of the present disclosure, as the activation and the deactivation of the multi-function button 91 are exhibited for each screen and the function of the multi-function button 91 is notified to the user via the function display area 405 when the multi-function button 91 is activated, convenience of the user in using the multi-function button 91 may be improved.

[0462] Referring to FIG. 17B, the pause screen 520 according to one embodiment of the present disclosure may include a pause display area 522. The pause screen 520 switched from the course progress screen 510 may have a screen configuration similar to that of the course progress screen 510.

[0463] For example, the pause screen 520 may display the name of the course that was being performed in the laundry treatment process P3, and may display the completion level of the execution, the execution time, and the like. In addition, the pause screen 520 may include the pause display area 522 that indicates the 'paused state' to notify the user that the current state is the paused state. A specific phrase of the pause display area 522 may be variously set.

[0464] In one example, in one embodiment of the present disclosure, when the multi-function button 91 is manipulated on the pause screen 520, the screen outputter 8 may output the course cancellation screen 530 for confirming a course cancellation intention of the usere.

[0465] FIG. 18B illustrates a state in which the multi-function button 91 is manipulated on the pause screen 520 to output the course cancellation screen 530 on the screen outputter 8.

[0466] A phrase for asking the user whether to perform the course cancellation process may be displayed on the course cancellation screen 530, and a plurality of items that the user may select via the dial 56 may be displayed.

[0467] According to one embodiment of the present disclosure, even when the multi-function button 91 is manipulated by the user on the pause screen 520, the course cancellation screen 530 may be output on the screen outputter 8 so as to confirm the intention of the user to cancel the course again.

[0468] In one example, in one embodiment of the present disclosure, the course cancellation screen 530 may display a consent item for the course cancellation, and the controller 60 may perform the course cancellation process when the multi-function button 91 is manipulated in a state in which the consent item is to be selected.

[0469] Furthermore, the course cancellation screen 530 may display the plurality of items including the consent item, and a target item scheduled to be selected based on the manipulation of the multi-function button

91 among the plurality of items may be displayed separately from the rest.

[0470] That is, the course cancellation screen 530 may display the consent item for agreeing with the course cancellation function and a return item for cancelling the course cancellation function and returning to the paused state together.

[0471] The user may manipulate the manipulator such that the object-to-be-selected indicator is located on one of the consent item and the return item on the course cancellation screen 530. For example, the user may rotate the dial 56 to change the location of the object-to-be-selected indicator to one of the consent item and the return item.

[0472] In one example, the user may instruct the controller 60 to perform the course cancellation function by manipulating the manipulator in a state in which the object to be selected is set to be the consent item. In addition, the user may instruct the controller 60 to cancel the course cancellation function and return to the paused state by manipulating the manipulator in a state in which the object to be selected is set to be the return item.

[0473] In one example, in one embodiment of the present disclosure, the course cancellation screen 530 may include the function display area 405 that displays a selection completion function of the multi-function button 91. That is, the user may complete the selection of the item on which the object-to-be-selected indicator is located by manipulating the multi-function button 91 on the course cancellation screen 530.

[0474] That is, the controller 60 may change the function of the multi-function button 91 to the selection completion function on the course cancellation screen 530, and may perform a process of the item on which the object-to-be-selected indicator is located on the course cancellation screen 530 when the manipulation signal of the multi-function button 91 is input.

[0475] For example, the controller 60 may perform the course cancellation process when the multi-function button 91 is manipulated in the state in which the consent item is the object to be selected, and may cancel the course cancellation process and return to the paused state when the multi-function button 91 is manipulated in the state in which the return item is the object to be selected.

[0476] In one example, in one embodiment of the present disclosure, when the course cancellation process is performed, the screen outputter 8 may output a cancellation guidance screen 531 that guides the canceled state of the course.

[0477] Content for notifying the user that the course has been canceled may be displayed on the cancellation guidance screen 531. The cancellation guidance screen 531 may be displayed in the pop-up form. The cancellation guidance screen 531 may be output in the pop-up form from the course cancellation screen 530, the course selection screen 410, and the other screen, and may be output in a partial area of the display 84 as shown in FIG. 18C.

[0478] In one example, FIG. 19 is a view illustrating a state in which a course change screen 540 is output based on the manipulation signal of the manipulator in the state in which the pause screen 520 is output on the screen outputter 8 according to an embodiment of the present disclosure.

[0479] FIG. 19A illustrates the pause screen 520 that indicates the paused state of the laundry treatment process P3, FIG. 19B illustrates the course change screen 540 switched from the pause screen 520, and FIG. 19C illustrates a change guidance screen 541 output after the course change screen 540.

[0480] In one embodiment of the present disclosure, when the dial 56 is rotated in the state in which the pause screen 520 is output on the screen outputter 8, the controller 60 may perform a course change process for changing the currently paused course to another course.

[0481] The course change process may allow the user to select another course as the course selection screen 410 is output on the screen outputter 8 after the course is cancelled.

[0482] In one example, when the manipulation signal of the dial 56 is input in the state in which the pause screen 520 is output on the screen outputter 8, the controller 60 may perform the course change process. That is, the screen outputter 8 may output the course change screen 540 when the dial 56 is rotated on the pause screen 520.

[0483] That is, according to one embodiment of the present disclosure, when the execution button 53b is manipulated on the pause screen 520, the existing course may be resumed. Further, when the multi-function button 91 is manipulated, the course cancellation process may be performed. Further, when the dial 56 is manipulated, the course change process may be performed.

[0484] According to one embodiment of the present disclosure, various processes that may be performed in the paused state may be proposed to the user by maximally utilizing the button or the like that may be manipulated by the user on the pause screen 520.

[0485] When the dial 56 is rotated on the pause screen 520, the screen outputter 8 may output the course change screen 540 for confirming a course change intention of the user.

[0486] A consent item for the course change may be displayed on the course change screen 540, and the controller 60 may perform the course change process when the multi-function button 91 is manipulated in a state in which the consent item is to be selected.

[0487] A screen configuration of the course change screen 540 may be similar to the screen configuration of the course cancellation screen 530 described above. Referring to FIG. 19B, the course change screen 540 may display a phrase for cancelling the current course, and at the same time, asking the user whether to change the course.

[0488] Further, the consent item and a return item for

the course change process may be displayed on the course change screen 540. When the user selects the consent item, the controller 60 may perform the course change process, and when the user selects the return item, the controller 60 may cancel the course change process and return to the paused state.

[0489] Although FIG. 19B illustrates a state in which a content of "start new course" is displayed for the consent item and a content of "cancel" is displayed for the return item, names or phrases indicating the consent item and the return item may vary as necessary.

[0490] When the user presses the multi-function button 91 in a state in which the object-to-be-selected indicator is located on the consent item using the dial 56, the controller 60 may perform the course change process, and when the user presses the multi-function button 91 in a state in which the object-to-be-selected indicator is located on the return item, the controller 60 may cancel the course change process and return to the paused state.

[0491] The course change screen 540 may output the function display area 405 in the same manner as the course cancellation screen 530, and the selection completion function of the multi-function button 91 may be displayed in the function display area 405.

[0492] In one example, in one embodiment of the present disclosure, when the course change process is performed, the screen outputter 8 may output the change guidance screen 541 that guides a change state of the course.

[0493] When the consent item is selected by the user on the course change screen 540, the controller 60 may perform the course change process and control the screen outputter 8 to output the change guidance screen 541 on the display 84.

[0494] Because the course change screen 540 is for changing the course, the controller 60 may control the screen outputter 8 to be switched from the course change screen 540 to the course selection screen 410, and the change guidance screen 541 may be displayed in the pop-up form on the course selection screen 410. FIG. 19C illustrates a state in which the change guidance screen 541 is displayed in the pop-up form overlapping a portion of the course selection screen 410 according to an embodiment of the present disclosure.

[0495] A phrase indicating that the course change process has been performed may be displayed on the change guidance screen 541. The phrase for notifying the course change may be variously determined as necessary.

[0496] That is, in one embodiment of the present disclosure, the controller 60 may store the plurality of courses. The screen outputter 8 may output the course selection screen 410 on which the plurality of courses are displayed and one of the courses is selected by the user. The screen outputter 8 may be switched to the course selection screen 410 when the course change process is performed on the course change screen 540. The change guidance screen 541 may be output in the pop-up form for a preset time on the course selection screen 410.

[0497] In one example, FIG. 22 shows a flowchart of the method for controlling the laundry treating apparatus 1 for performing the course cancellation process and the course change process according to an embodiment of the present disclosure. The method for controlling the laundry treating apparatus 1 for performing the course cancellation process and the course change process will be described as follows with reference to FIG. 22.

[0498] The control method according to one embodiment of the present disclosure may include pause (S210), course end function activation (S220), course end function display (S230), course end signal determination (S240), dial signal determination (S250), pause release determination (S260), course end guidance (S242), course end (S244), course switch guidance, course selection return (S254), and pause release (S262).

[0499] In the pause (S210), when the execution signal of the execution button 53b is generated in the state in which the course progress screen 510 is output on the screen outputter 8, the controller 60 may stop the laundry treatment process P3.

[0500] In the course end function activation (S220), the controller 60 may activate the course end function of the multi-function button 91. That is, the controller 60 may recognize the manipulation signal of the multi-function button 91 as the course end function or the course cancellation function. The controller 60 may control the screen outputter 8 such that the multi-function button 91 emits light.

[0501] In the course end function display (S230), the controller 60 may control the screen outputter 8 to output the course cancellation screen 530 on the screen of the screen outputter 8 on which the pause screen 520 is output.

[0502] In the course end signal determination (S240), the controller 60 may determine whether the selection of the consent item displayed on the course cancellation screen 530 is input by the user.

[0503] In the course end guidance, the controller 60 may control the screen outputter 8 such that the screen notifying that the course cancellation process is performed is output on the screen outputter 8 in the state in which the consent item is selected by the user in the course end signal determination (S240).

[0504] In the course end (S244), the controller 60 may execute and complete the course cancellation process. When water exists in the tub 20, the controller 60 may remove water in the tub 20 via the draining process, and may control the opening/closing control device of the laundry door 40 to be released.

[0505] In one example, in the dial signal determination (S250), when it is determined in the course end signal determination (S240) that the manipulation signal of the multi-function button 91 is not input, the controller 60 may

determine whether the manipulation signal of the dial 56 is input.

[0506] In the course switch guidance (S252), when the manipulation signal of the dial 56 is input in the dial signal determination (S250), the controller 60 may control the screen outputter 8 to output the course change screen 540 for notifying the user that the course change process is performed.

[0507] In the course selection return (S254), the controller 60 may perform the course change process in the state in which the consent item is selected by the user in the course switch guidance (S252). In the course selection return (S254), when water exists in the tub 20, the controller 60 may remove water in the tub 20 via the draining process, and may control the opening and closing control device of the laundry door 40 to be released.

[0508] In one example, the controller 60 may control the screen outputter 8 to output the course selection screen 410. In addition, the controller 60 may control the screen outputter 8 such that the change guidance screen 541 for notifying the user that the course change process is performed is displayed. The change guidance screen 541 may be displayed in the pop-up form on the course selection screen 410.

[0509] In one example, in the pause release determination (S260), when the manipulation signal of the dial 56 is not input in the dial signal determination (S250), the controller 60 may determine whether the manipulation signal of the button 53b is input by the user.

[0510] In the pause release (S262), when it is determined in the pause release determination (S260) that the manipulation signal of the execution button 53b is input, the controller 60 may release the paused state and return to the laundry treatment process P3 to resume the course. The course progress screen 510 may be output on the screen outputter 8 again.

[0511] In one example, FIG. 20 is a view illustrating a state in which a screen including a QR code is output from the screen outputter 8 in an embodiment of the present disclosure. FIG. 20A is a view illustrating an error guidance screen 610 including an error QR code, and FIG. 20B is a view illustrating an app linkage screen 620 including a linking QR code.

[0512] The laundry treating apparatus 1 according to one embodiment of the present disclosure may include the cabinet 10, the drum 30, the screen outputter 8, and the controller 60. The controller 60 may control the screen outputter 8 to output the error guidance screen 610 for notifying the user of an abnormal state when the abnormal state is identified. The error QR code analyzed via the communication terminal 70 of the user that may exchange information with the controller 60 may be displayed on the error guidance screen 610.

[0513] In one embodiment of the present disclosure, there may be various check points for the laundry treatment process P3 to be performed. For example, there may be various check points such as whether the driver that rotates the drum 30 performs normal control, whether the detergent supply is normal, whether the water supply normally operates, whether the drainage normally operates, whether the air supply normally operates, and whether the opening/closing control device of the laundry door 40 normally operates.

[0514] The controller 60 may control the screen outputter 8 such that error guidance screen 610 is output from the screen outputter 8 and enter an error state when the abnormal state for the check points or the like existing in performing the laundry treatment process P3 as described above exists.

[0515] The controller 60 may determine the abnormal state as described above in the booting process P1, the course setting process P2, and the laundry treatment process P3, and may stop the procedure for treating the laundry and standby until the error is resolved when the error state is entered.

[0516] In one example, the error guidance screen 610 may include an error QR code area 611, an error code display area 612, and an error content display area, and may further include the function display area 405.

[0517] An error QR code in association with a currently identified abnormal state may be displayed in the error QR code area 611. The controller 60 may store a plurality of error QR codes respectively corresponding to various abnormal states in advance, and control the screen outputter 8 such that the error QR code corresponding to the current abnormal state is displayed in the error QR code area 611.

[0518] The error QR code may be interpreted via the communication terminal 70 of the user. That is, the communication terminal 70 may analyze image information of the error QR code to obtain information extracted from the error QR code.

[0519] For example, an application in association with the laundry treating apparatus 1 according to one embodiment of the present disclosure may be installed in the communication terminal 70, and the user may interpret the error QR code via the application of the communication terminal 70.

[0520] The error QR code may provide direct information on a description or a solution of the corresponding abnormal state or include link information that may be connected to related information. For example, the application of the communication terminal 70 may access the information indicating the description or the solution of the abnormal state via the link information extracted from the error QR code. The information may be directly stored in the application or stored on a separately prepared server.

[0521] That is, according to one embodiment of the present disclosure, as the error QR code that may include the link information is provided instead of the information related to the abnormal state being directly stored in the controller 60, the controller 60 may overcome a calculation capacity or storage capacity limit and effectively provide the information related to the abnormal state to the user.

[0522] In one example, an error code corresponding to the abnormal state may be displayed in the error code display area 612. Further, a name for the user to easily recognize the corresponding abnormal state may be displayed together.

[0523] An error content guidance area 613 may display an error content of the corresponding abnormal state. The user may check the content of the error content guidance area 613 to easily identify the current problem.

[0524] In one example, the error guidance screen 610 may display the function display area 405. That is, the multi-function button 91 may be activated when the error guidance screen 610 is output on the screen outputter 8. In the error guidance screen 610, the multi-function button 91 may have a confirmation function.

[0525] The user may manipulate the multi-function button 91 on the error guidance screen 610 to deviate from the error guidance screen 610. For example, the user may resolve the error content based on the error guidance screen 610 and manipulate the multi-function button 91 to deviate from the error guidance screen 610.

[0526] When the multi-function button 91 is manipulated on the error guidance screen 610, the controller 60 may deviate from the error state. However, the controller 60 may again identify whether the error has been resolved, and when the error has not been resolved, may control the screen outputter 8 to output the error guidance screen 610 again or to continuously output the error guidance screen 610 despite the manipulation of the multi-function button 91.

[0527] In one example, when the error content displayed on the error guidance screen 610 corresponds to a recommendation for normal use of the laundry treating apparatus 1 and is not an essential point, for example, when it is identified that a softening agent does not exist in the detergent supply in a state in which input of the softening agent is set, the controller 60 may display the error content based on the corresponding abnormal state to the user via the screen outputter 8 using the error guidance screen 610. However, even when the user manipulates the multi-function button 91 without an action required to ignore the corresponding error, the controller 60 may deviate from the error state regardless of whether the corresponding error has been resolved.

[0528] That is, in one embodiment of the present disclosure, even when some of the plurality of errors corresponding to the abnormal states have not been necessarily resolved, they may be ignored based on an intention of the user and the laundry treatment process P3 may be performed.

[0529] In one example, in one embodiment of the present disclosure, the error QR code may provide information to the communication terminal 70 via the application that may be used via the communication terminal 70. As described above, the error QR code may include the link information that may be connected to the information corresponding to the corresponding error code.

[0530] The error guidance screen 610 may include the error QR code area 611 in which the error QR code is displayed, the error code display area 612 in which the error code corresponding to the abnormal state is displayed, and the error content guidance area 613 in which the content of the abnormal state is displayed.

[0531] In one example, the screen outputter 8 may output the notification screen 320 that provides the information to the user during a preparation process of the course that is performed after the laundry treating apparatus is turned on, and the notification screen 320 may be composed of a plurality of screens including the error guidance screen 610.

[0532] As described above, in one embodiment of the present disclosure, when the power button 53a is pressed and the booting process P1 is performed, the booting screen 300 may be output on the screen outputter 8. The booting screen 300 may display a logo or the like for indicating a manufacturer or may display various phrases for showing intimacy to the user.

[0533] In addition, the booting screen 300 may provide various information to the user before the laundry treating apparatus 1 is used. The booting screen 300 may include the notification screen 320, and the notification screen 320 may display information necessary for the user.

[0534] In one example, the above-described error guidance screen 610 may be displayed as one of the notification screens 320. That is, the screen outputter 8 may output the notification screen 320 in the booting process P1, and the error guidance screen 610 may be output as one of the notification screens 320.

[0535] That is, the controller 60 may check preparation items for using the laundry treating apparatus 1 for the laundry treatment process P3 or the like in the booting process P1, and may control the screen outputter 8 to output the error guidance screen 610 in the process of outputting the notification screen 320 when the abnormal state is identified during the checking.

[0536] In one example, in one embodiment of the present disclosure, the screen outputter 8 may output the course progress screen 510 that displays progress information of the course to the user, and the error guidance screen 610 may be output in the pop-up form while the course progress screen 510 is output.

[0537] That is, in the laundry treatment process P3 in which the course selected by the user via the course selection screen is performed, the controller 60 may control the screen outputter 8 to output the error guidance screen 610 on the course progress screen 510 when the abnormal state is found during the execution of the laundry treatment process P3, for example, when a fabric jamming phenomenon in the drum 30, the abnormal operation of the driver, the abnormal operations of the water supply and the drainage, and the like are identified.

[0538] When the error guidance screen 610 is displayed during the output of the course progress screen 510, the error guidance screen 610 may be output in the pop-up form on the course progress screen 510. In addition, the error guidance screen 610 may be output in

an entire area of the display 84 or only in a partial area of the display 84. When the error guidance screen 610 is output in the partial area of the display 84, the error guidance screen 610 may be displayed in a form of an additional layer overlapping the course progress screen 510.

[0539] In one example, as described above, when the multi-function button 91 is manipulated while the error guidance screen 610 is output, the screen outputter 8 may end the output of the error guidance screen 610.

[0540] However, when it is identified by the controller 60 that the corresponding error content has not been resolved, and when the resolving of the corresponding error content is essential for the subsequent process, the error guidance screen 610 may be output again.

[0541] In addition, as described above, the error guidance screen 610 may include the function display area 405 that displays an error guidance end function of the multi-function button 91.

[0542] In one example, the error QR code may provide the link information connected to video information for resolving the abnormal state to the communication terminal 70. That is, the communication terminal 70 may access the video information for resolving the abnormal state by interpreting the error QR code.

[0543] The video information may be stored in a server provided by the manufacturer or directly stored in the communication terminal 70. According to one embodiment of the present disclosure, the calculation capacity or the storage capacity of the controller 60 may be overcome and the video information that may be easily and conveniently understood by the user may be provided via the link information providing method using the error QR code.

[0544] In one example, the error QR code may provide information on connection with a service center for checking the abnormal state to the communication terminal 70.

[0545] For example, when it is difficult for the user to directly process the content of the corresponding abnormal state, for example, when the content of the corresponding abnormal state corresponds to the failure of the driver or the like, the error QR code may provide the information on the connection with of the service center that may perform repair of the laundry treating apparatus 1 according to one embodiment of the present disclosure. That is, the communication terminal 70 may be directly connected to the service center while analyzing the error QR code, or the information on the connection with the service center may be provided.

[0546] In one example, referring to FIG. 20B, in one embodiment of the present disclosure, the screen outputter 8 may output the app linkage screen 620 on which the linking QR code including information for the application installed in the communication terminal 70 and the controller 60 to be linked with each other is displayed.

[0547] The app linkage screen 620 is a screen on which the linking QR code is displayed. The controller 60 may control the screen outputter 8 to output the app linkage screen 620 based on the manipulation signal of the manipulator.

[0548] In one embodiment of the present disclosure, as described above, the controller 60 and the communication terminal 70 may be linked with each other, and the controller 60 may output the linking QR code for providing information on linkage with the controller 60 to the communication terminal 70 via the screen outputter 8.

[0549] The communication terminal 70 may interpret the linking QR code via the above-described application, and a process of linking with the controller 60 may be performed based on the linkage information obtained by interpreting the linking QR code.

[0550] According to one embodiment of the present disclosure, as the linking QR code for the linkage between the laundry treating apparatus 1 and the communication terminal 70 is provided, the user may conveniently scan the linking QR code to perform the linking process.

[0551] In one example, in one embodiment of the present disclosure, the app linkage screen 620 may include a linking QR code area 621 in which the linking QR code is displayed, and a linking QR guidance area 622 that guides a usage method of the linking QR code.

[0552] The linking QR code described above may be displayed in the linking QR code area 621. In one example, different linking processes may be performed depending on a type or the like of the communication terminal 70, and thus a plurality of linking QR codes corresponding to the respective types of the communication terminal 70 may be displayed together or alternatively displayed in the linked QR code area 621.

[0553] The linking QR guidance area may display a phrase for guiding the user to perform the linking process between the laundry treating apparatus 1 and the communication terminal 70 by scanning the linking QR code. A specific phrase displayed in the linked QR guidance area may be variously set as necessary.

[0554] FIG. 20B illustrates a state in which the linking QR code area 621 in which the plurality of interlocking QR codes are displayed together is defined at an upper side of the display 84 and the linking QR guidance area is defined at a lower side of the display 84 according to one embodiment of the present disclosure. When the plurality of linking QR codes are displayed in the linking QR code area 621, the types of communication terminals 70 of the respective linking QR codes may be displayed together.

[0555] In one example, the app linkage screen 620 may include a first linking screen and a second linking screen, the linking QR code may be displayed on the first linking screen, and the screen outputter 8 may be switched from the first linking screen to the second linking screen when the multi-function button 91 is manipulated in a state in which the first linking screen is output.

[0556] FIG. 20B illustrates a state in which the first linking screen is output on the screen outputter 8 and the function display area 405 is included in the first linking

screen. That is, the first linking screen may include the function display area 405 that displays a linking progress function of the multi-function button 91.

[0557] The user may perform a procedure after scanning the linking QR code by manipulating the multi-function button 91 on the first linking screen. The second linking screen may display a screen indicating the linkage between the controller 60 and the communication terminal 70, a manipulation method required by the communication terminal 70, a manipulation method required by the manipulator of the laundry treating apparatus 1, or the like.

[0558] In one example, in one embodiment of the present disclosure, the screen outputter 8 may output a setting screen where a plurality of setting items are displayed and one of the setting items is to be selected by the user, and may output the app linkage screen 620 when an application linkage item is selected among the plurality of setting items on the setting screen.

[0559] For example, in the state in which the course selection screen 410 is output on the screen outputter 8, the user may manipulate the setting button 240 among the plurality of additional option buttons located in the option unit 200 to output the setting screen on the screen outputter 8.

[0560] The setting screen may display a setting list including various setting items including the app linkage item, and the user may rotate the dial 56 on the setting list to set the app linkage item as the object to be selected and then manipulate the multifunctional button 91 to output the app linkage screen 620 on the screen outputter 8.

[0561] That is, in one embodiment of the present disclosure, when the dial 56 is rotated on the setting screen, the screen outputter 8 may change the object to be selected from the plurality of setting items and display the changed object to be selected, and when the multi-function button 91 is manipulated, may output a screen corresponding to the setting item displayed as the object to be selected.

[0562] Although the present disclosure has been illustrated and described in connection with the specific embodiment, it would be obvious to a person skilled in the art that the present disclosure may be variously modified and changed without departing from the technical spirit of the present disclosure provided by the claims below.

Claims

1. A laundry treating apparatus comprising:

a cabinet;
a drum rotatably disposed in the cabinet and configured to accommodate laundry therein;
a manipulator disposed on the cabinet and manipulated by a user to generate a manipulation signal; and
a screen outputter disposed on the cabinet and configured to output a screen for providing information to the user,
wherein, during execution of a course for treating the laundry, the screen outputter is configured to output a course progress screen configured to display execution information of the course,
wherein the manipulator includes a multi-function button activated in at least some of a plurality of processes performed in the course, wherein when the multi-function button is manipulated by the user in the activated state, a laundry addition process for additionally inputting the laundry is performed while the course is in progress.

2. The laundry treating apparatus of claim 1, wherein the course progress screen includes a function display area configured to indicate that the multi-function button is activated and the laundry addition process is able to be performed.

3. The laundry treating apparatus of claim 2, wherein the course progress screen further includes an executed course display area configured to display a currently performed course, an execution time display area configured to display time information of the currently performed course, an executed process display area configured to display information on a process currently performed in the course, and an execution completion level display area configured to display a completion level of the currently performed course.

4. The laundry treating apparatus of claim 2, wherein the course progress screen is configured to remove the function display area while a process where the laundry addition process is not able to be applied among the plurality of processes is in progress.

5. The laundry treating apparatus of claim 1, wherein the screen outputter is switched to a pause screen configured to display a paused state of the course when the multi-function button activated in the course progress screen is manipulated.

6. The laundry treating apparatus of claim 5, wherein the screen outputter is configured to output the pause screen after outputting a laundry addition guidance screen illustrating the laundry addition process on the course progress screen.

7. The laundry treating apparatus of claim 6, wherein the laundry addition guidance screen is output in a pop-up form for a preset time on the pause screen.

8. The laundry treating apparatus of claim 6, wherein the screen outputter is configured to return to the course progress screen from the pause screen when

the laundry addition process is ended.

9. The laundry treating apparatus of claim 1, further comprising a controller configured to control rotation of the drum, to perform the course, to set whether the laundry addition process is able to be applied for each of a plurality of courses, and to activate the multi-function button while a process where the laundry addition process is able to be applied is performed.

10. The laundry treating apparatus of claim 9, further comprising a tub disposed in the cabinet and having the drum rotatably installed therein, wherein the tub is configured to receive water therein,
wherein the controller is configured to perform a draining process of discharging water in the tub to the outside of the cabinet when the laundry addition process is performed.

11. The laundry treating apparatus of claim 10, wherein the controller is configured to discharge water in the tub in the draining process such that an amount of water in the tub is equal to or smaller than a predetermined reference water amount.

12. The laundry treating apparatus of claim 10, wherein the cabinet has a laundry inlet defined therein in communication with the inside of the drum and a laundry door configured to open and close the laundry inlet, wherein the controller is configured to perform a door release process of releasing a locked state of the laundry door when the draining process is ended in the laundry addition process.

13. The laundry treating apparatus of claim 12, wherein the manipulator further includes an execution button for instructing the controller to perform the course,
wherein the controller is configured to resume the course when the execution button is manipulated after the door release process in the laundry addition process.

14. The laundry treating apparatus of claim 13, wherein the plurality of different courses are stored in the controller,

wherein the screen outputter is configured to output a course selection screen where the plurality of courses are displayed and one of the plurality of courses is selected based on the manipulation signal,
wherein the controller is configured to perform the course displayed on the course selection screen when the execution button is manipulated on the course selection screen, and control the screen outputter to output the course progress screen.

15. The laundry treating apparatus of claim 1, wherein the multi-function button is configured to vary a function depending on the screen output on the screen outputter.

16. The laundry treating apparatus of claim 15, wherein a plurality of different courses are stored in the controller,
wherein the screen outputter is configured to output a course selection screen where the plurality of courses are displayed and one of the plurality of courses is selected based on the manipulation signal, wherein when the multi-function button is manipulated while the course selection screen is output, an option recommendation screen configured to display a recommended option combination for the course displayed on the course selection screen is output.

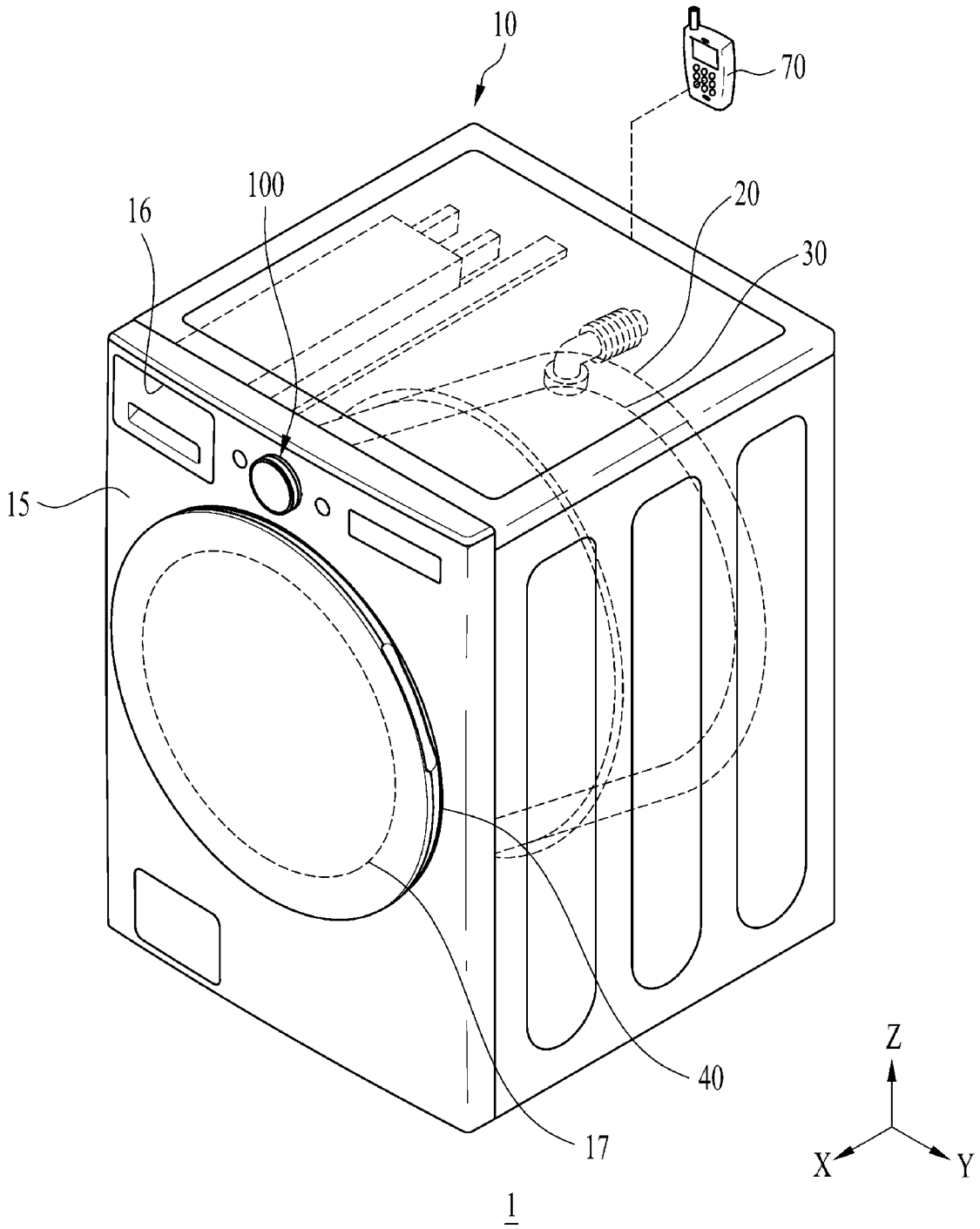
17. The laundry treating apparatus of claim 1, wherein while the course progress screen is output on the screen outputter, the multi-function button is activated in a washing process of the course and is deactivated in a dehydration process of the course.

18. A method for controlling a laundry treating apparatus, the method comprising:

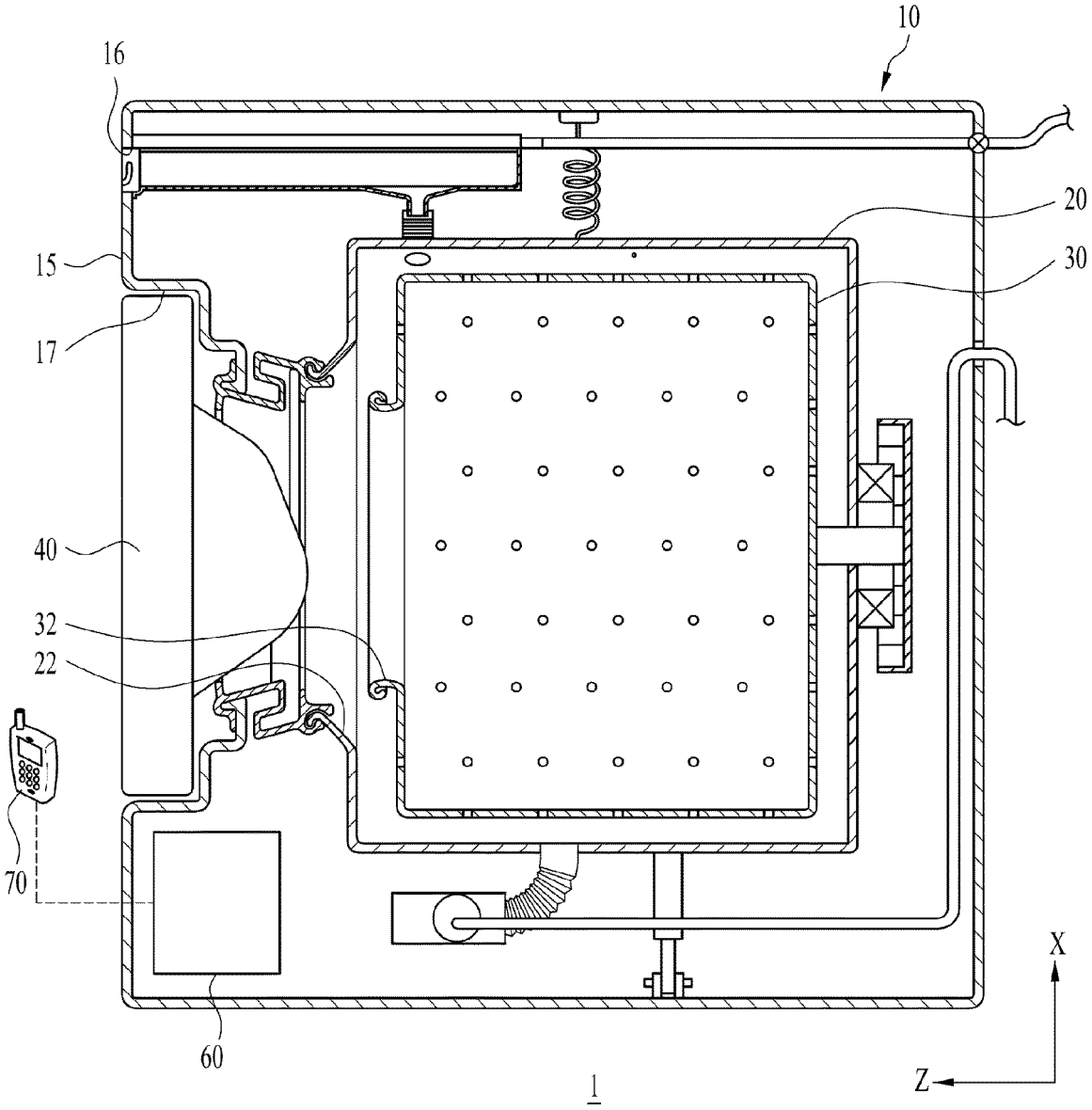
laundry addition determination of performing, by a controller, a course for treating laundry, and determining whether a laundry addition process for additionally inputting the laundry is able to be performed in a process currently performed based on the course;
button function locking of deactivating, by the controller, a multi-function button disposed on a cabinet and manipulated by a user when it is determined in the laundry addition determination that the laundry addition process is not able to be performed in the currently performed process; and
laundry addition function activation of activating, by the controller, the multi-function button when it is determined in the laundry addition determination that the laundry addition process is able to be performed in the currently performed process.

19. The method of claim 18, further comprising, after the laundry addition function activation, laundry addition function display of controlling, by the controller, a screen outputter for providing information to the user to display a function of the multi-function button and notify the user that the laundry is able to be added.

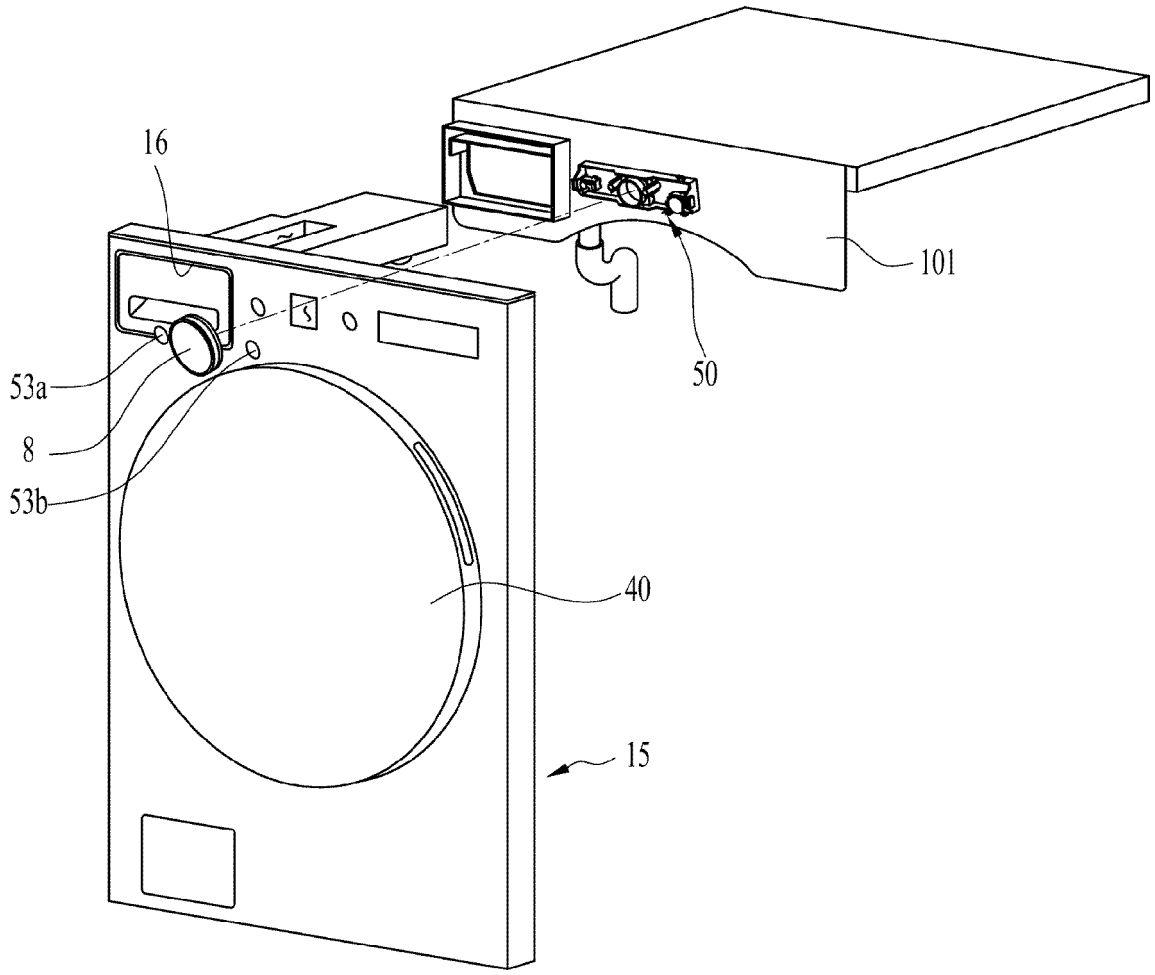
[Fig. 1]



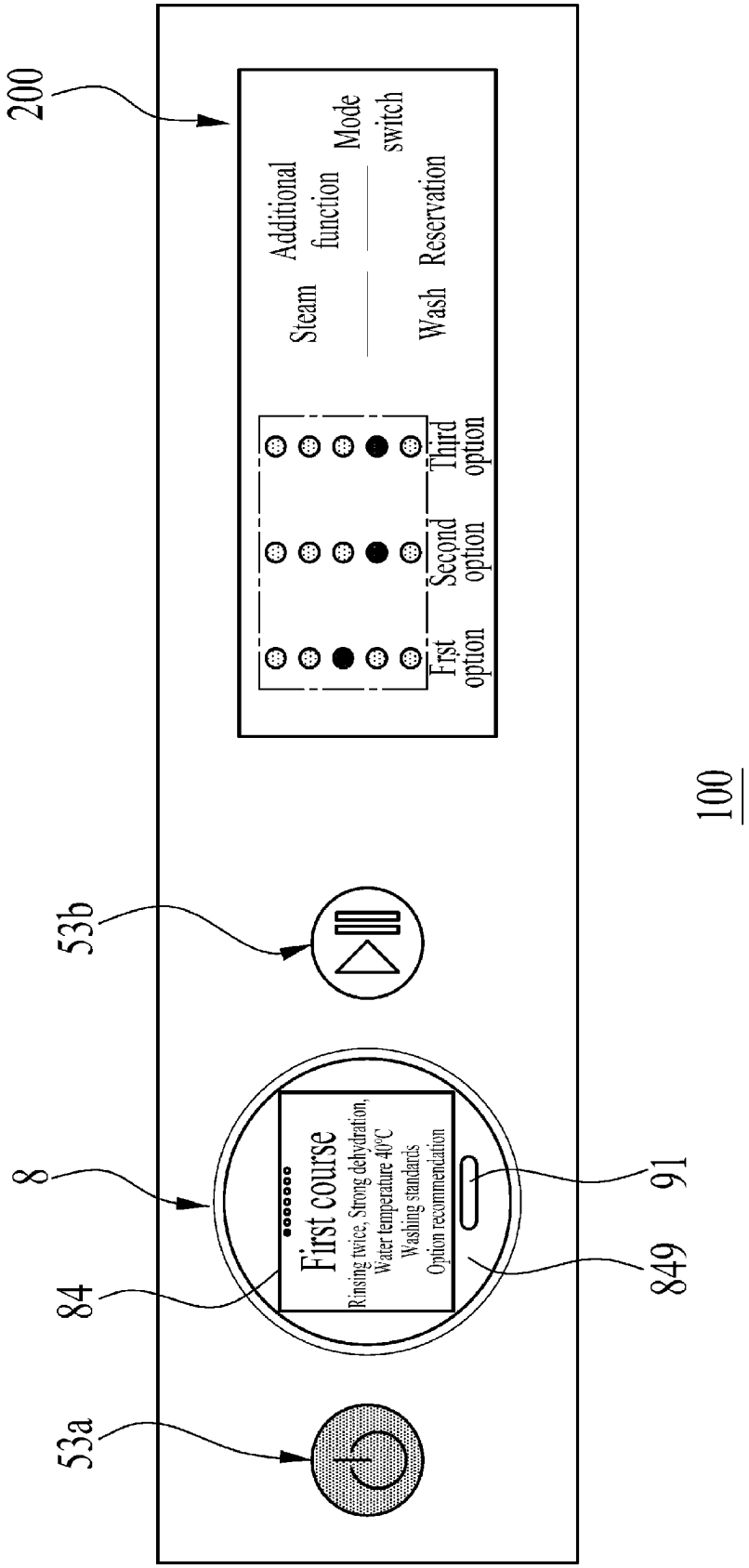
[Fig. 2]



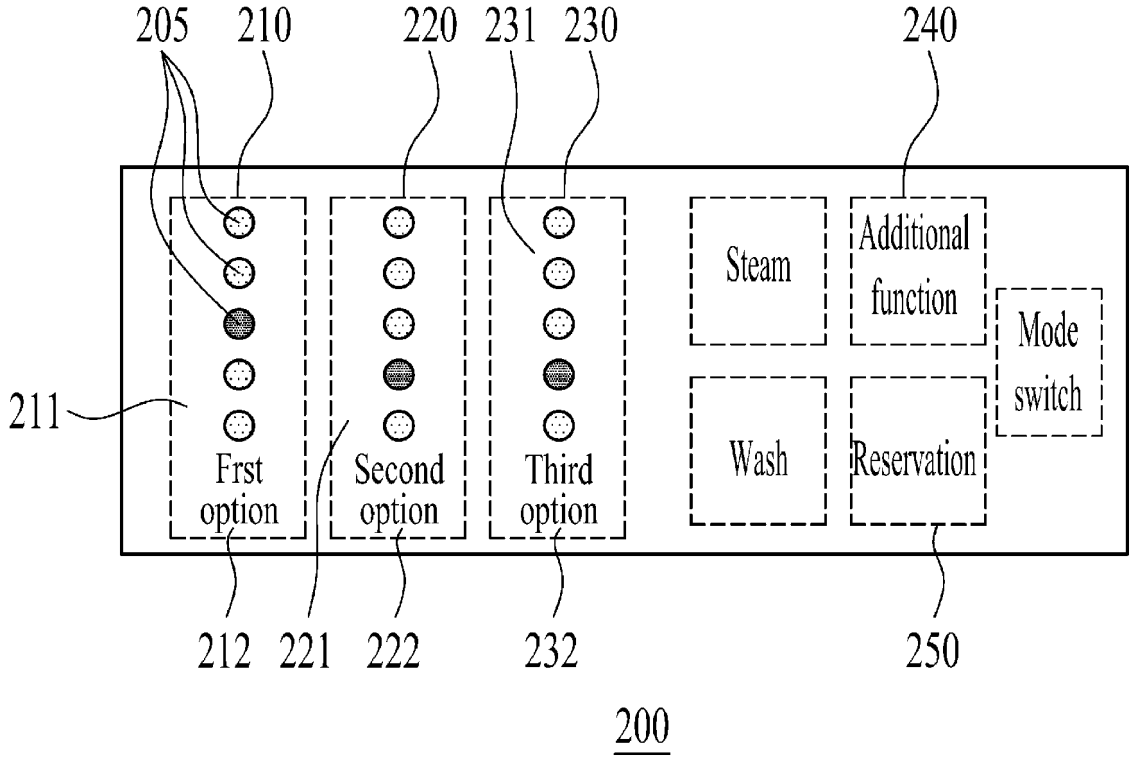
[Fig. 3]



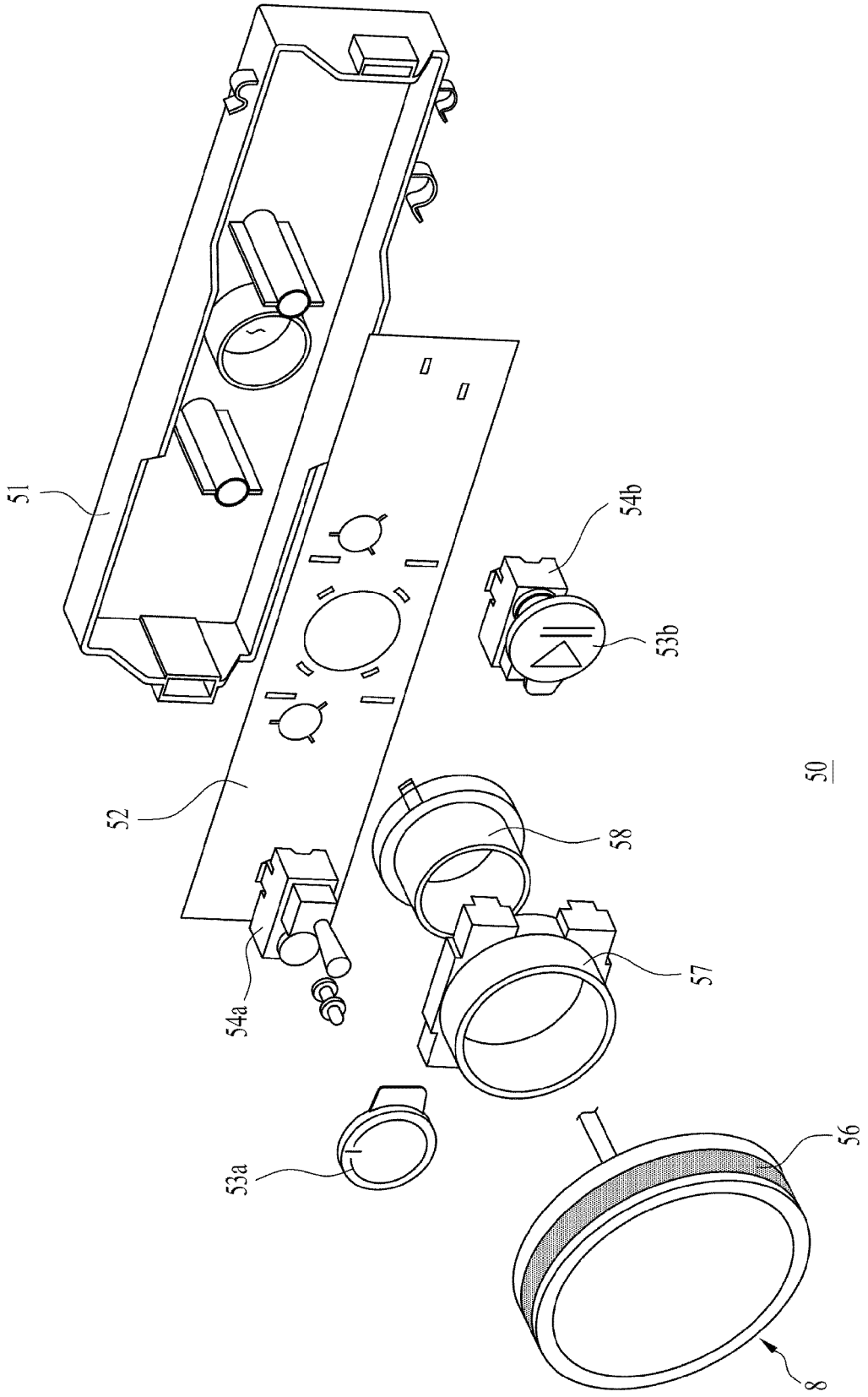
[Fig. 4]


200
Steam
Additional function
Mode switch
Wash
Reservation
Frst option
Second option
Third option
100
53b
8
First course
Rinsing twice, Strong dehydration,
Water temperature 40°C
Washing standards
Option recommendation
91
84
849
53a

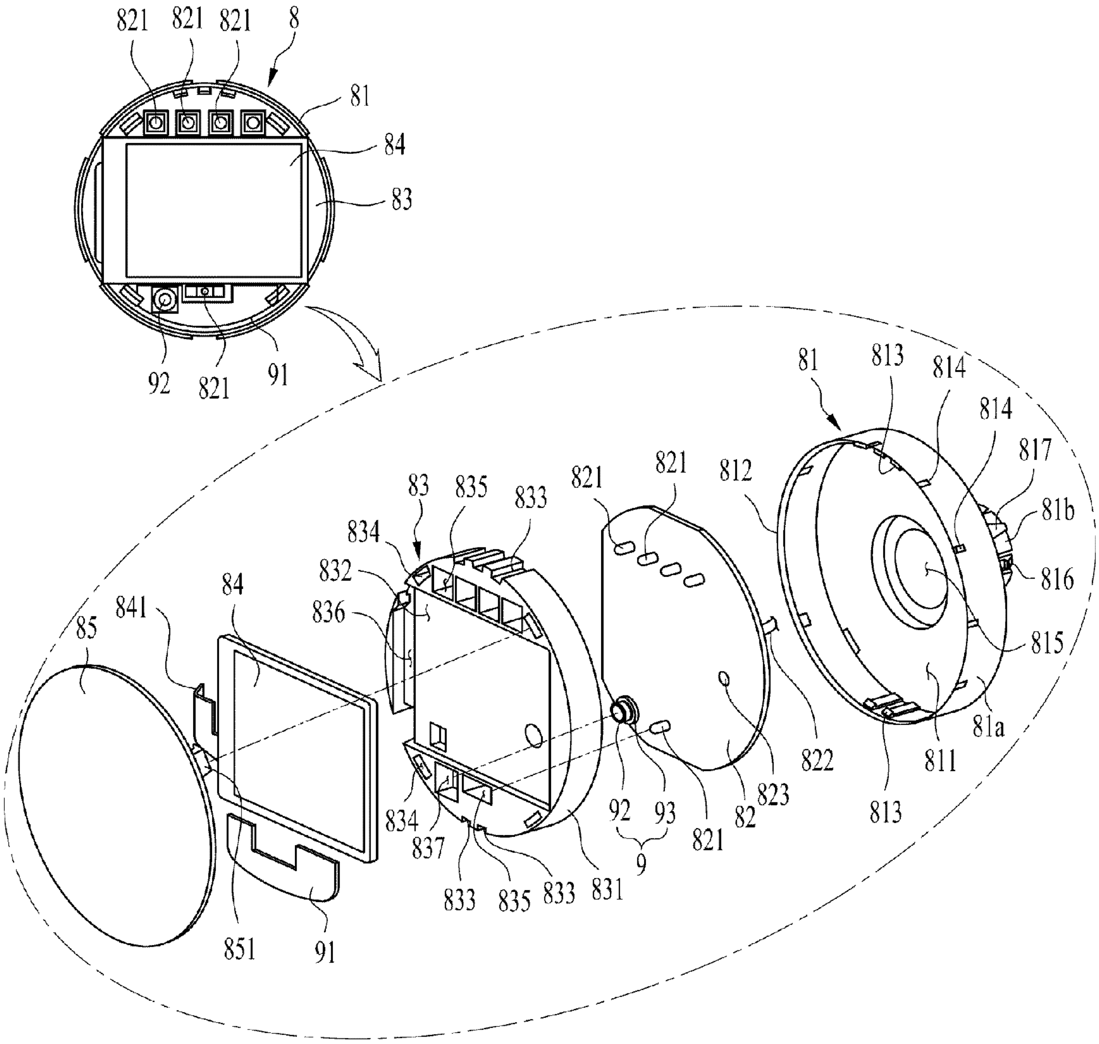
[Fig. 5]


205
210
220
231
230
240
211
Frst option
Second option
Third option
Steam
Additional function
Mode switch
Wash
Reservation
212
221
222
232
250
200

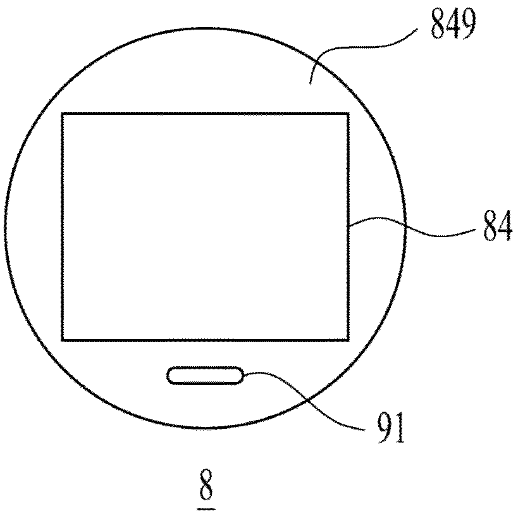
[Fig. 6]



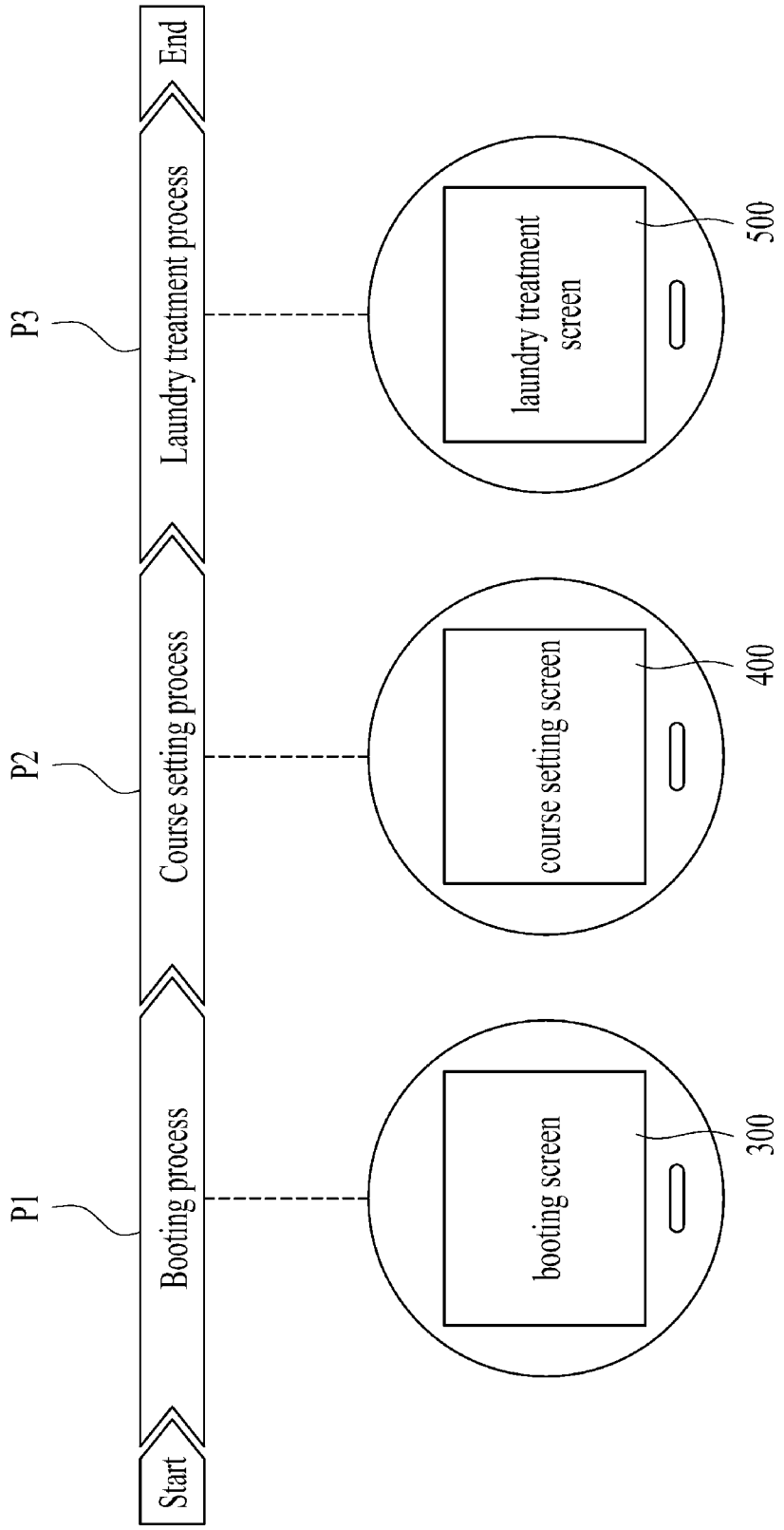
[Fig. 7]


821
821
821
8
81
84
83
92
821
91
81
813
814
814
817
81b
816
815
81a
811
813
812
822
821
821
823
82
821
92
93
9
83
835
833
834
832
836
84
841
85
851
91
834
837
833
835
833
831

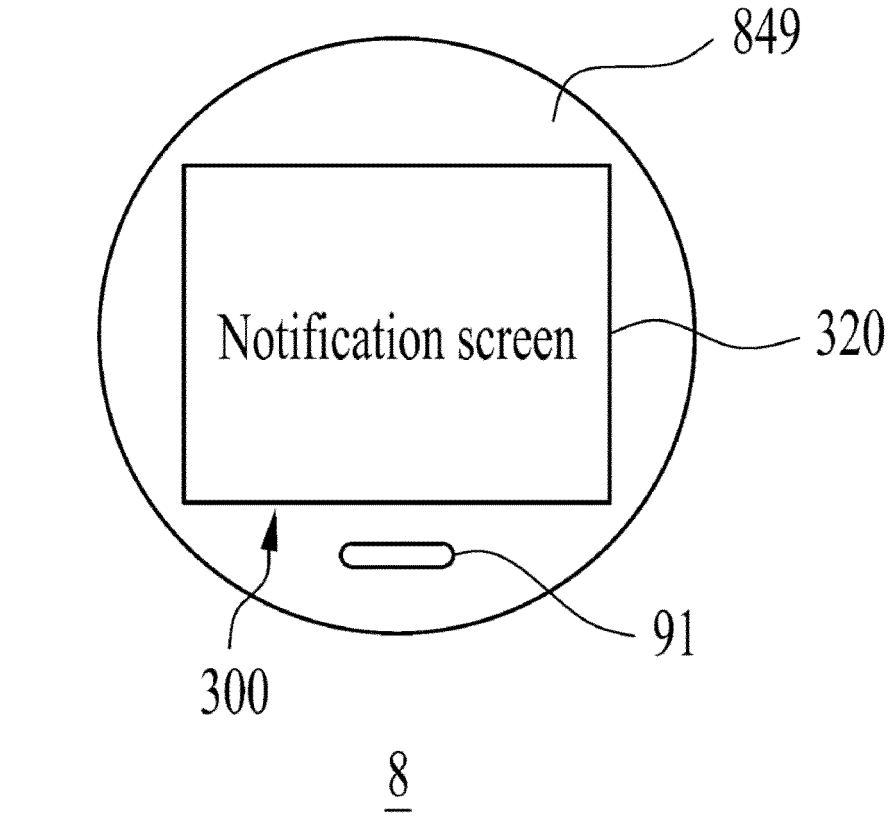
[Fig. 8]


849
84
91
8

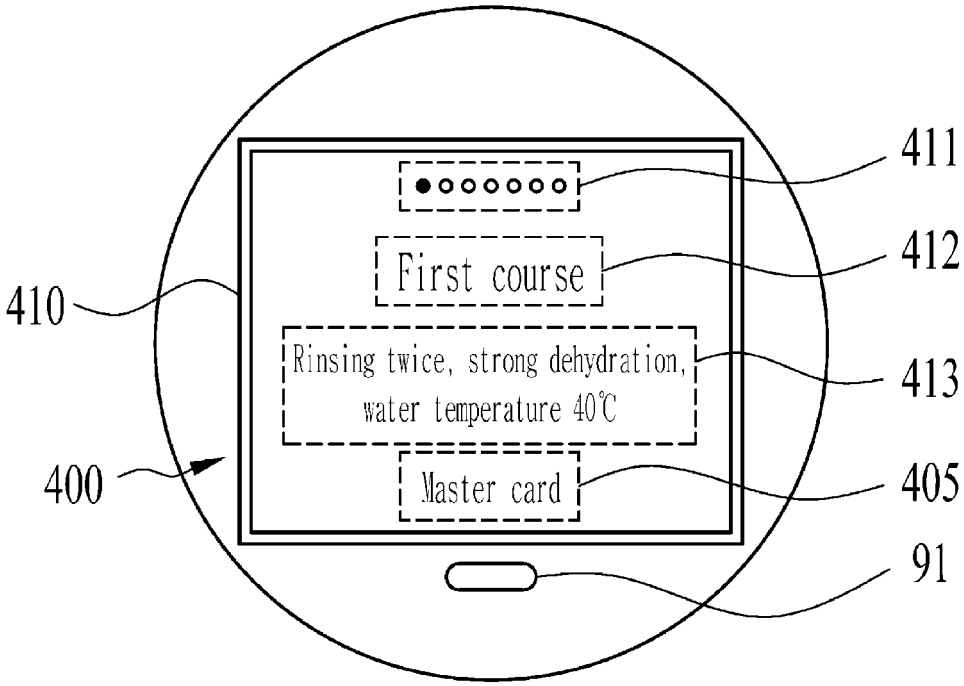
[Fig. 9]


Start
Booting process
Course setting process
Laundry treatment process
End
P1
P2
P3
booting screen
300
course setting screen
400
laundry treatment screen
500

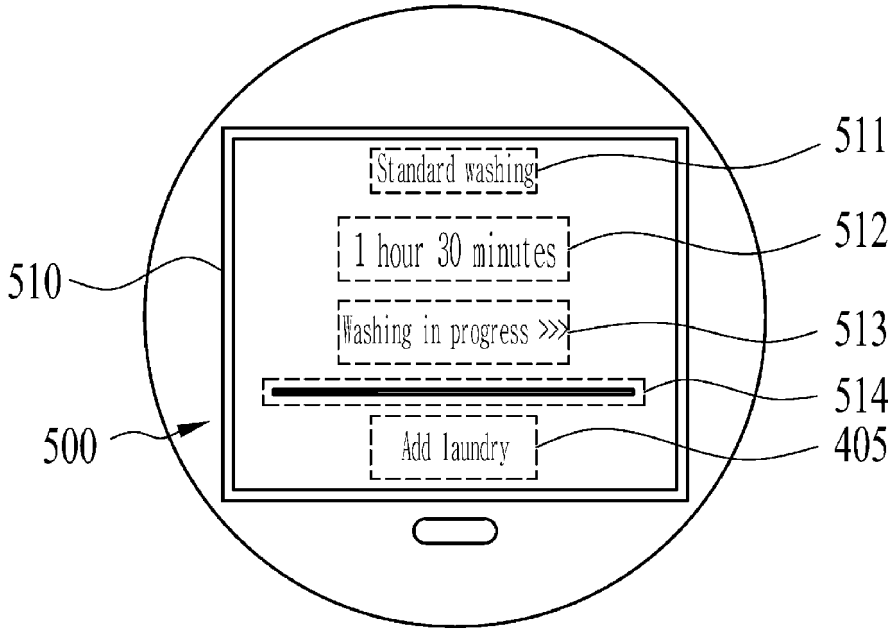
[Fig. 10]


849
Notification screen
320
91
300
8

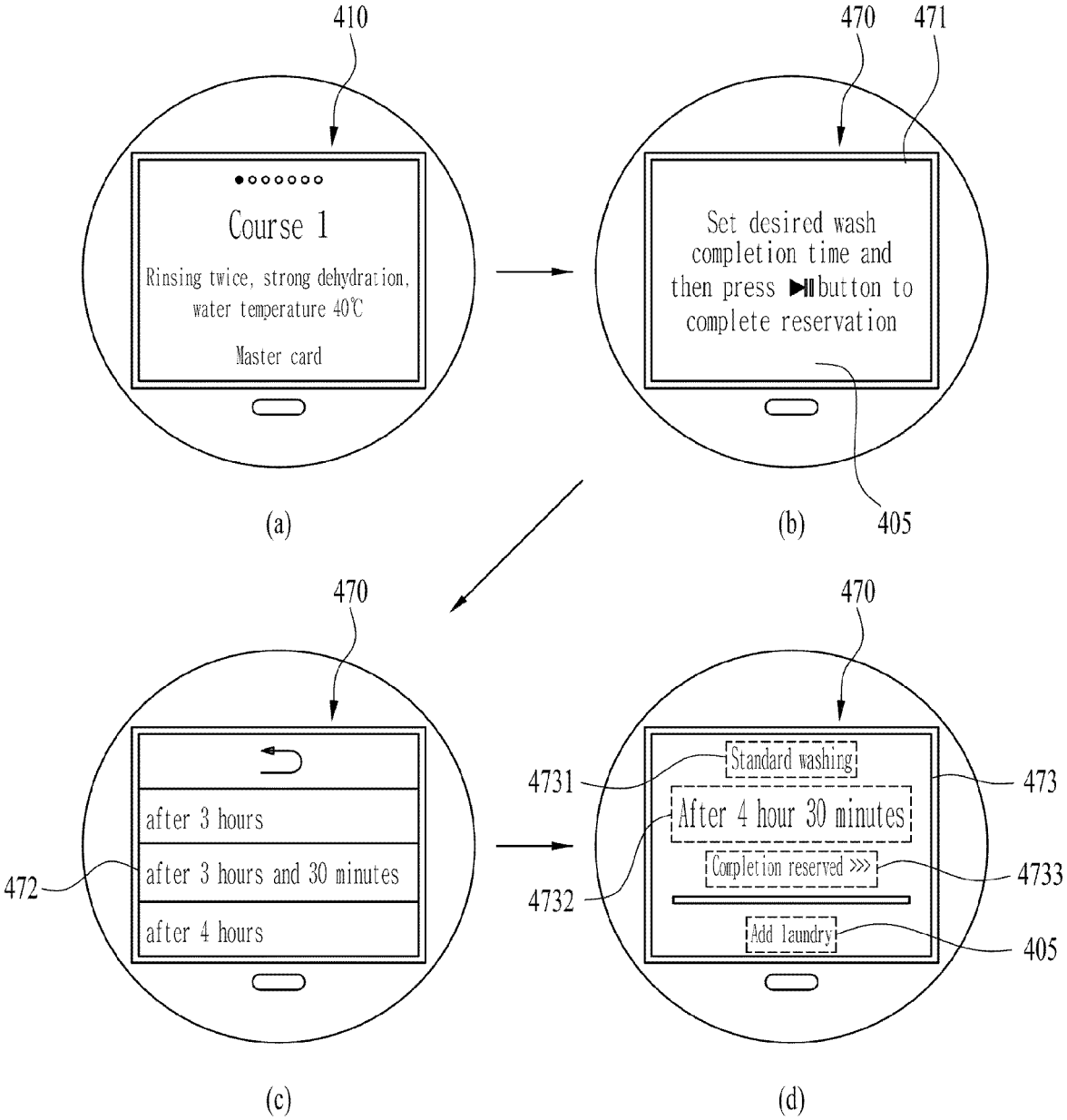
[Fig. 11]


411
First course
412
410
Rinsing twice, strong dehydration,
water temperature 40℃
413
400
Master card
405
91

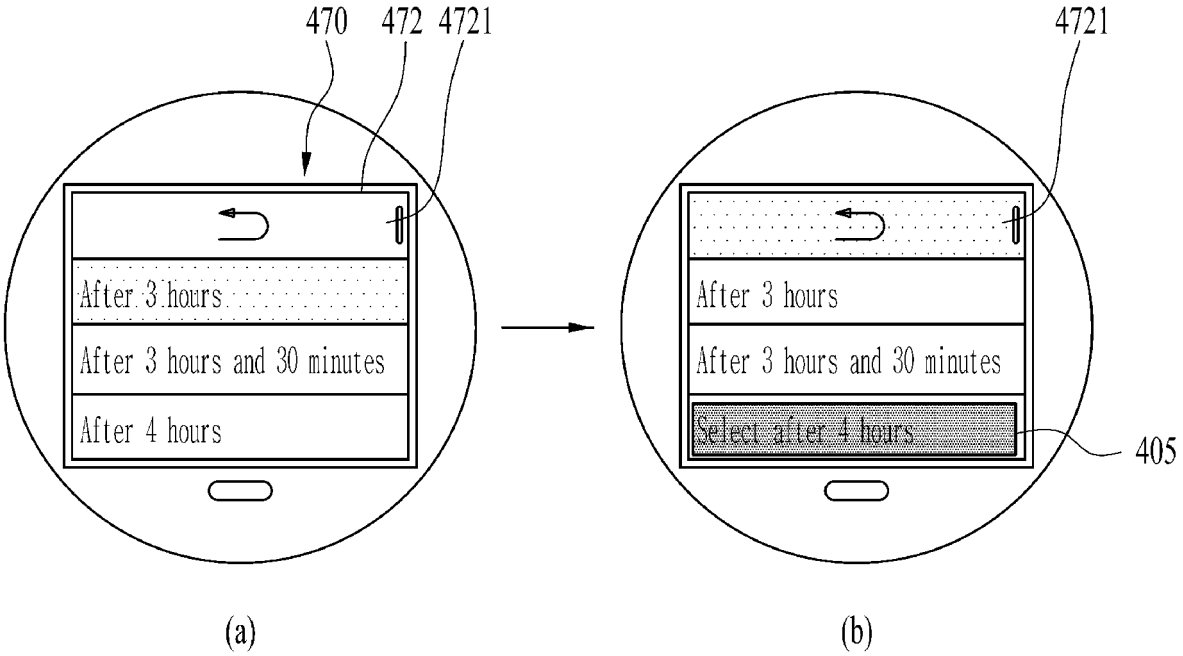
[Fig. 12]


Standard washing
1 hour 30 minutes
Washing in progress
Add laundry
510
500
511
512
513
514
405

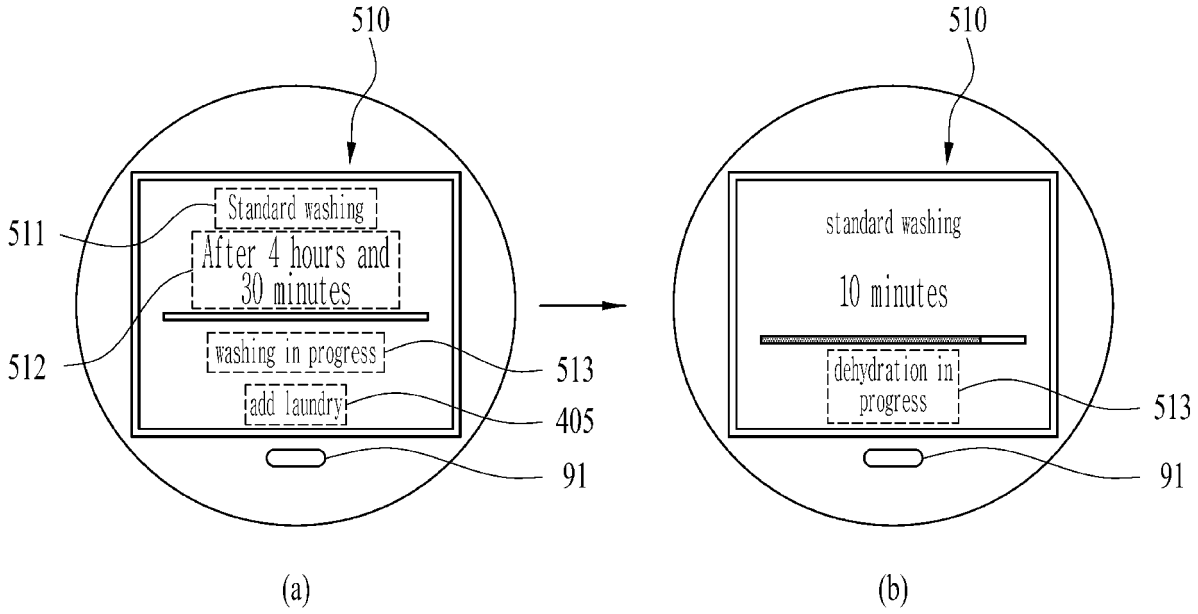
[Fig. 13]


410
Course 1
Rinsing twice, strong dehydration, water temperature 40℃
Master card
(a)
470
471
Set desired wash completion time and then press ⏯button to complete reservation
405
(b)
470
after 3 hours
after 3 hours and 30 minutes
after 4 hours
472
(c)
470
Standard washing
After 4 hour 30 minutes
Completion reserved >>>
Add laundry
4731
4732
473
4733
405
(d)

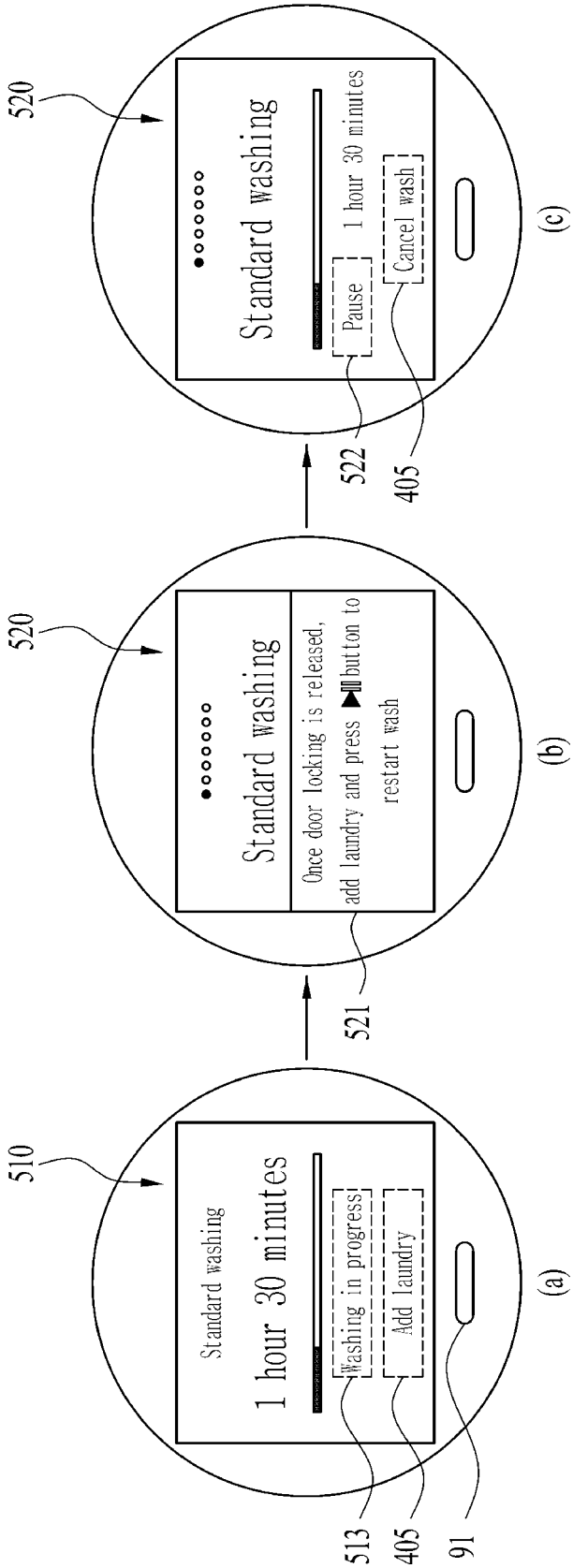
[Fig. 14]


470
472
4721
After 3 hours
After 3 hours and 30 minutes
After 4 hours
4721
After 3 hours
After 3 hours and 30 minutes
Select after 4 hours
405
(a)
(b)

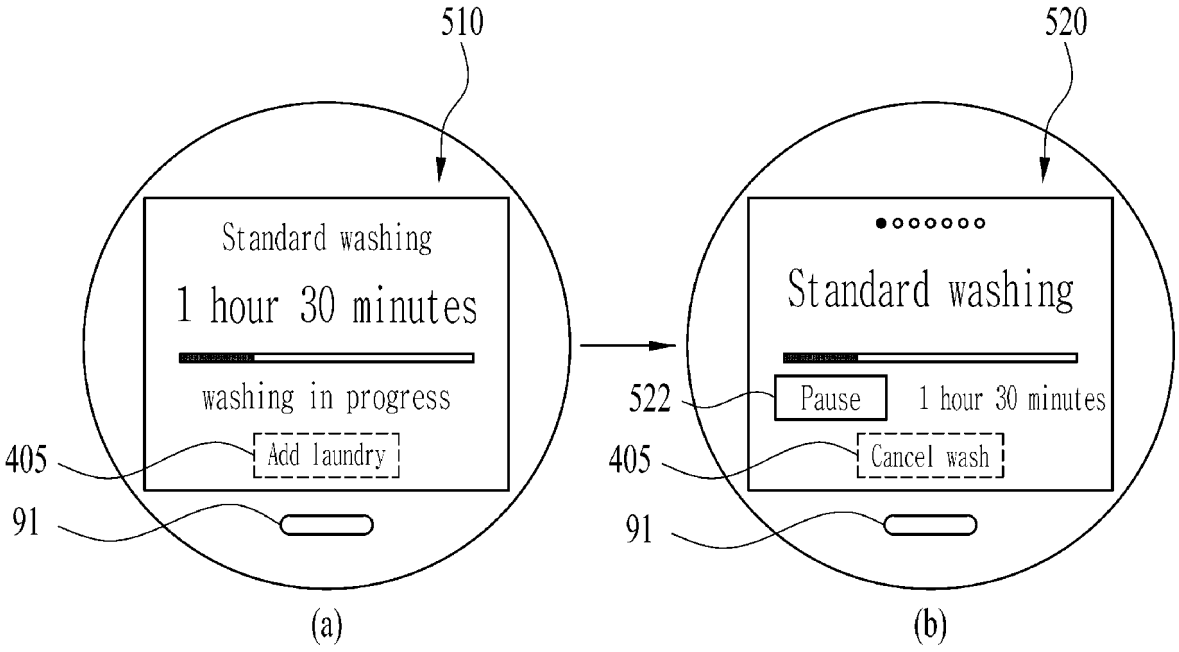
[Fig. 15]


510
511
Standard washing
After 4 hours and 30 minutes
512
washing in progress
add laundry
513
405
91
510
standard washing
10 minutes
dehydration in progress
513
91
(a)
(b)

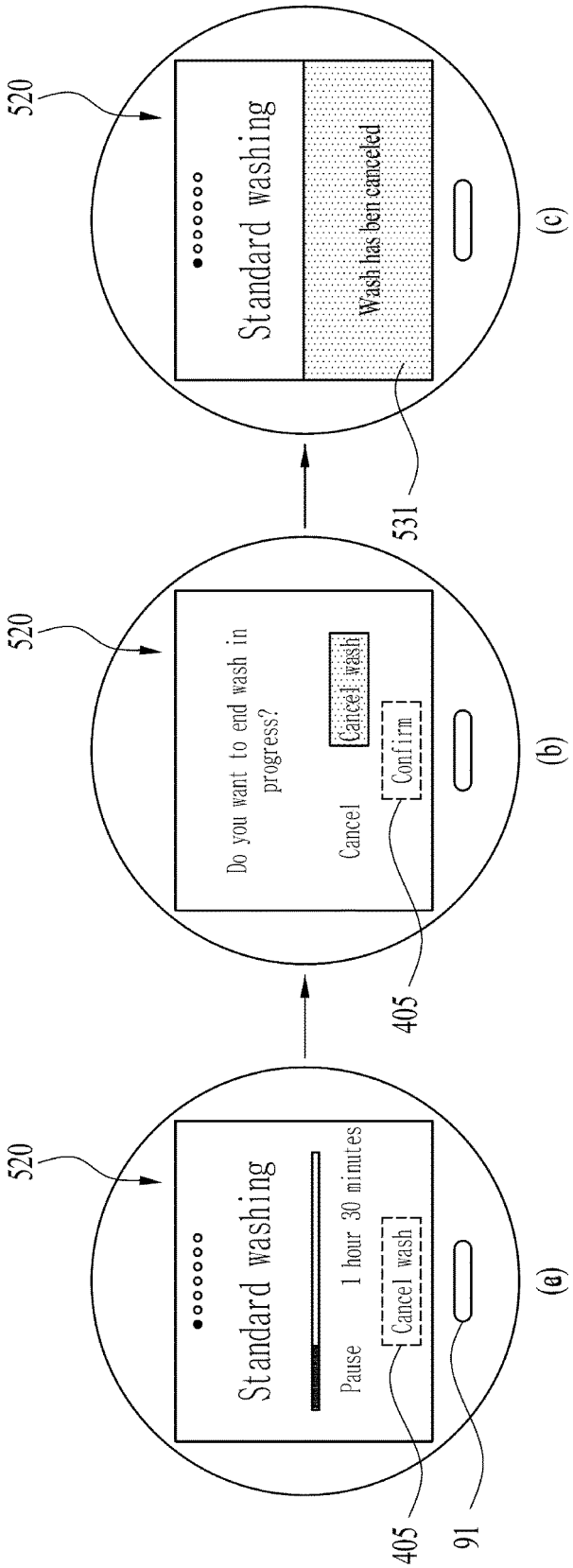
[Fig. 16]


510
Standard washing
1 hour 30 minutes
Washing in progress
Add laundry
513
405
91
(a)
520
Standard washing
Once door locking is released, add laundry and press ▶II button to restart wash
521
(b)
520
Standard washing
1 hour 30 minutes
Pause
Cancel wash
522
405
(c)

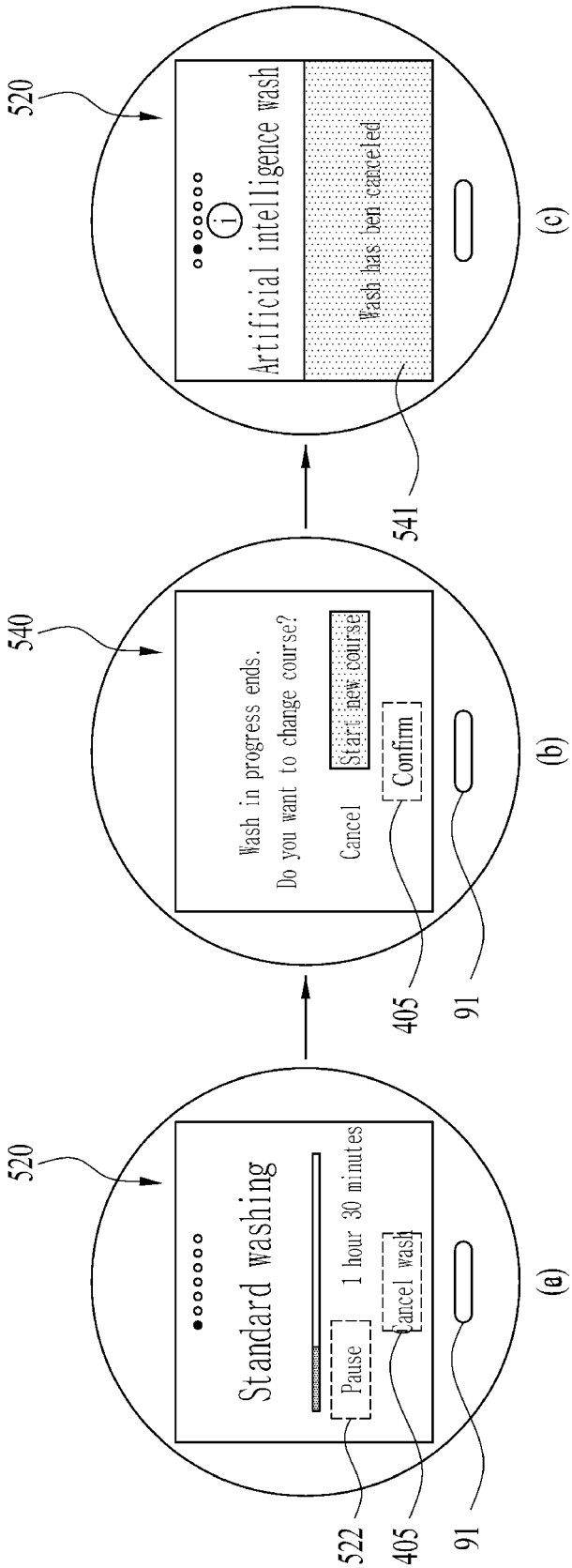
[Fig. 17]


510
520
Standard washing
1 hour 30 minutes
washing in progress
Add laundry
405
91
(a)
Standard washing
522
Pause
1 hour 30 minutes
405
Cancel wash
91
(b)

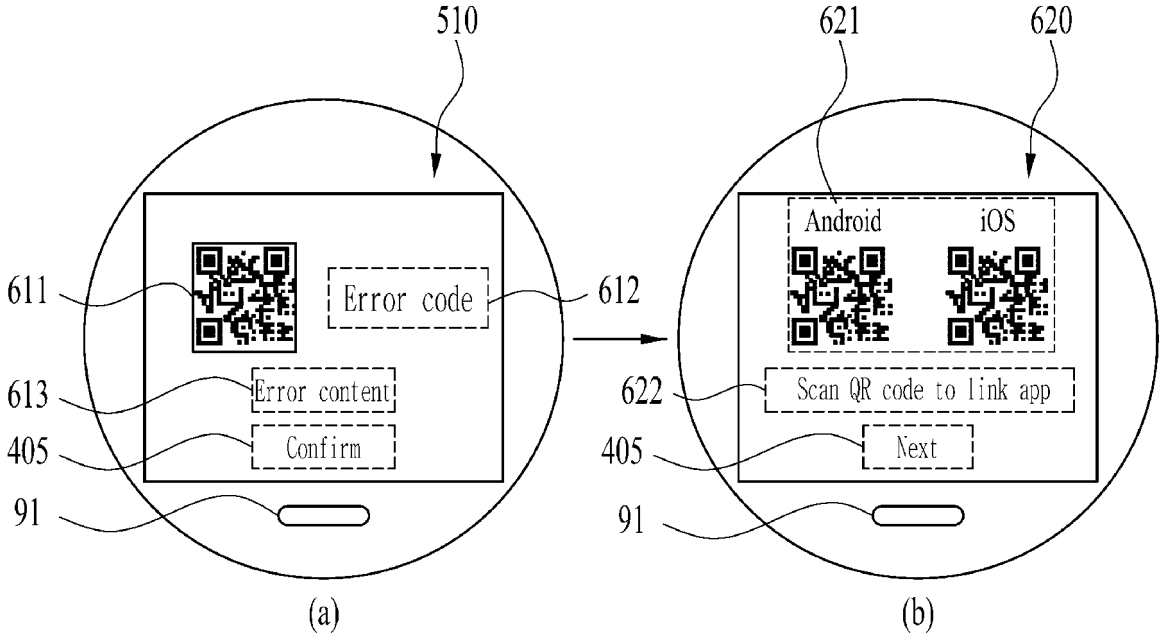
[Fig. 18]


520
Standard washing
Pause
1 hour 30 minutes
Cancel wash
405
91
(a)
520
Do you want to end wash in progress?
Cancel
Confirm
405
(b)
520
Standard washing
Wash has ben canceled
531
(c)

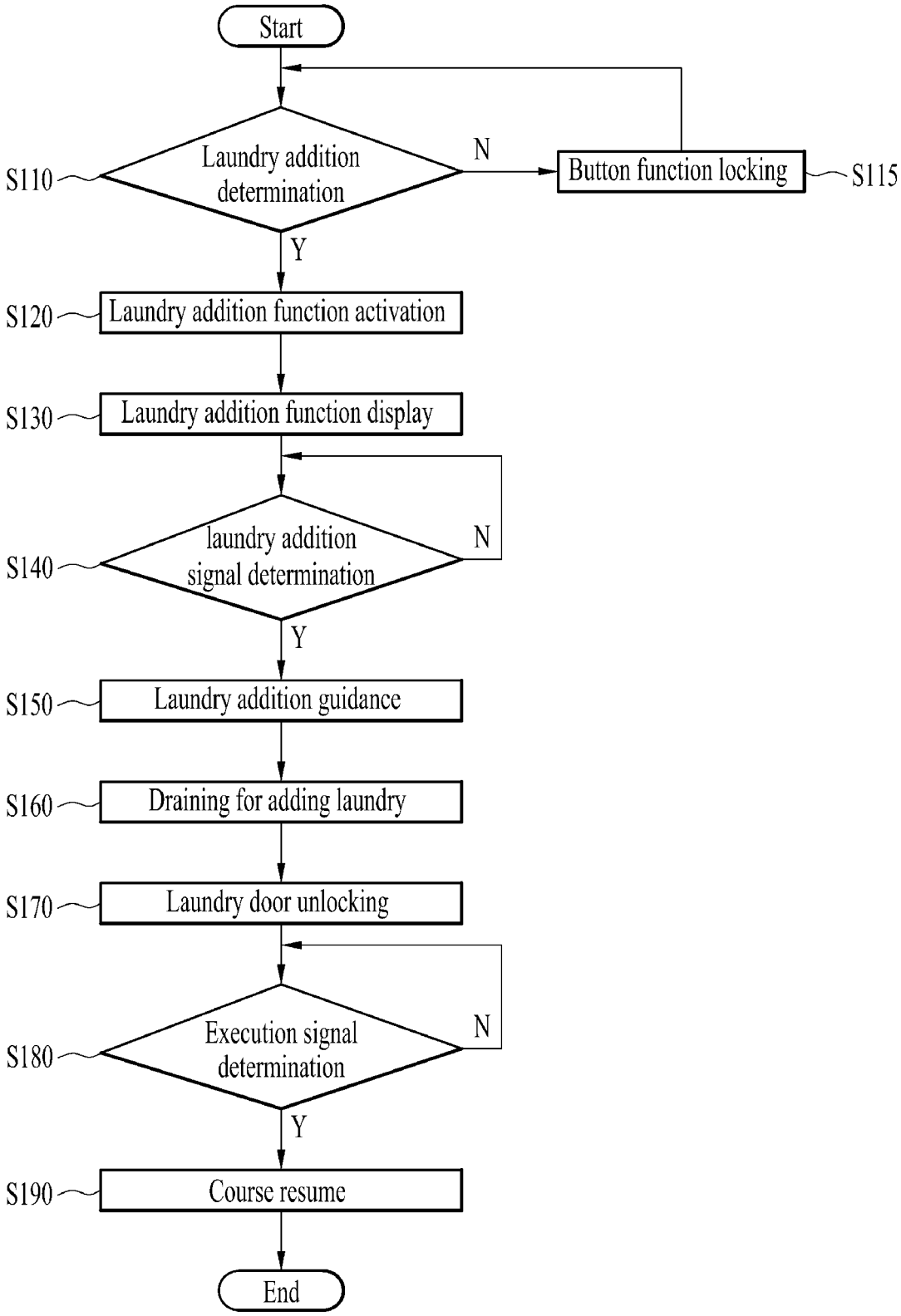
[Fig. 19]


520
Standard washing
Pause
1 hour 30 minutes
Cancel wash
522
405
91
(a)
540
Wash in progress ends.
Do you want to change course?
Cancel
Start new course
Confirm
405
91
(b)
520
Artificial intelligence wash
Wash has been canceled
541
(c)

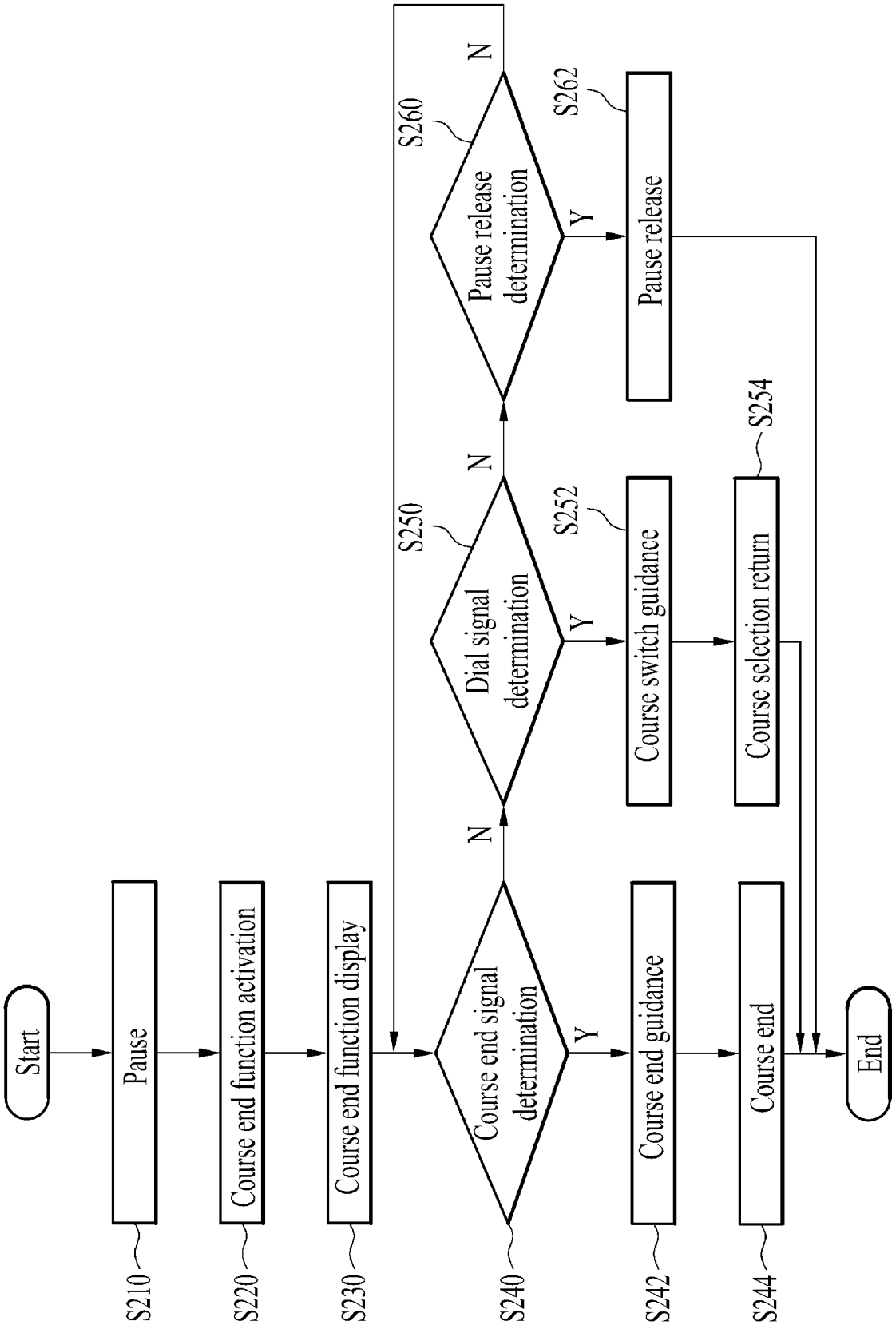
[Fig. 20]


510
621
620
611
Error code
612
613
Error content
405
Confirm
91
(a)
Android
iOS
622
Scan QR code to link app
405
Next
91
(b)

[Fig. 21]


Start
S110
Laundry addition determination
N
Button function locking
S115
Y
S120
Laundry addition function activation
S130
Laundry addition function display
S140
laundry addition signal determination
N
Y
S150
Laundry addition guidance
S160
Draining for adding laundry
S170
Laundry door unlocking
S180
Execution signal determination
N
Y
S190
Course resume
End

[Fig. 22]


Start
Pause
Course end function activation
Course end function display
Course end signal determination
Course end guidance
Course end
End
Dial signal determination
Course switch guidance
Course selection return
Pause release determination
Pause release
S210
S220
S230
S240
S242
S244
S250
S252
S254
S260
S262
Y
N

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2022/008339

A. CLASSIFICATION OF SUBJECT MATTER

D06F 34/28(2020.01)i; **D06F 34/30**(2020.01)i; **D06F 34/34**(2020.01)i; **D06F 34/32**(2020.01)i; **D06F 39/08**(2006.01)i; **D06F 39/14**(2006.01)i; **D06F 34/14**(2020.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

D06F 34/28(2020.01); D06F 33/00(2006.01); D06F 33/02(2006.01); D06F 33/30(2020.01); D06F 37/04(2006.01); D06F 37/06(2006.01); D06F 37/10(2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models: IPC as above
Japanese utility models and applications for utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & keywords: 의류(clothes), 세탁(laundry), 코스(course), 버튼(button), 추가(add), 디스플레이(display), 옵션(option), 다기능(multifunctional)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2016-0062917 A (LG ELECTRONICS INC.) 03 June 2016 (2016-06-03) See paragraphs [0060]-[0097] and [0109] and figures 2-5.	1-17
X	KR 10-0811660 B1 (SAMSUNG ELECTRONICS CO., LTD.) 11 March 2008 (2008-03-11) See paragraphs [0047]-[0061] and figure 5.	18-19
Y		1-17
A	KR 10-2047957 B1 (SAMSUNG ELECTRONICS CO., LTD.) 22 November 2019 (2019-11-22) See paragraphs [0053]-[0050] and figures 1-5.	1-19
A	US 2019-0153648 A1 (WHIRLPOOL CORPORATION) 23 May 2019 (2019-05-23) See claims 1-5 and figures 16-19.	1-19
A	US 2017-0218546 A1 (WUXI LITTLE SWAN CO., LTD.) 03 August 2017 (2017-08-03) See claims 1 and 8 and figure 4.	1-19

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
07 October 2022	**07 October 2022**
Name and mailing address of the ISA/KR **Korean Intellectual Property Office** **Government Complex-Daejeon Building 4, 189 Cheongsa-ro, Seo-gu, Daejeon 35208** Facsimile No. **+82-42-481-8578**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2019)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2022/008339

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
KR 10-2016-0062917 A	03 June 2016	EP 3225730 A1	04 October 2017
		EP 3225730 A4	01 August 2018
		EP 3988699 A1	27 April 2022
		KR 10-2243658 B1	23 April 2021
		US 10920357 B2	16 February 2021
		US 2017-0321367 A1	09 November 2017
		WO 2016-085131 A1	02 June 2016
KR 10-0811660 B1	11 March 2008	None	
KR 10-2047957 B1	22 November 2019	AU 2016-306814 B2	04 October 2018
		CN 107849783 A	27 March 2018
		EP 3296445 A1	21 March 2018
		KR 10-2017-0019052 A	21 February 2017
		KR 10-2018-0048501 A	10 May 2018
		US 10982369 B2	20 April 2021
		US 2018-0237971 A1	23 August 2018
		WO 2017-026711 A1	16 February 2017
US 2019-0153648 A1	23 May 2019	EP 3486360 A1	22 May 2019
		EP 3486360 B1	23 February 2022
		US 10662567 B2	26 May 2020
US 2017-0218546 A1	03 August 2017	CN 107012658 A	04 August 2017
		CN 205741619 U	30 November 2016
		EP 3199691 A1	02 August 2017
		US 9771676 B2	26 September 2017

Form PCT/ISA/210 (patent family annex) (July 2019)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 1020140023986 A **[0003]**
- KR 1020160062917 A **[0007]**