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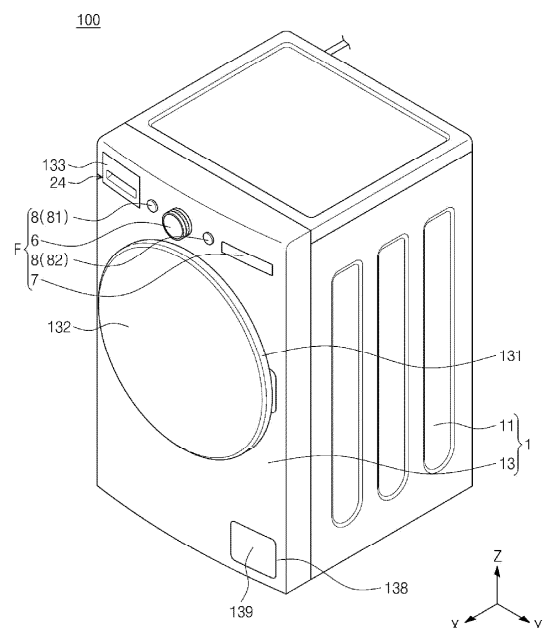
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(54) **LAUNDRY TREATING APPARATUS**

(57) Disclosed is a laundry treating apparatus (100) including a cabinet (1) including a front panel (13), an inlet (131) formed through the front panel, and an outlet (133) located above the inlet, a door (132) configured to open and close the inlet, a receiving unit (2) configured to provide a receiving space for a target to be treated that is supplied to the inlet, a moving unit (245) configured to be withdrawable from the outlet, the moving unit forming a liquid storage space or a flow path communicating with the receiving unit, and an input/output (6) unit including a rotary input portion (6a) rotatably provided on the front panel, the rotary input portion being configured to allow a control command to be selected or input therethrough, and an output portion (6b) located in the rotary input portion, the output portion being configured to output set information when the rotary input portion is rotated.

【Figure 1】



EP 4 741 558 A1

Description

[0001] The present disclosure relates to a laundry treating apparatus.

[0002] A laundry treating apparatus is an apparatus that performs washing and drying of a target to be treated (clothing, bedding, etc.). The laundry treating apparatus may include a cabinet forming an exterior thereof and a receiving unit provided in the cabinet to receive laundry.

[0003] The cabinet may include an inlet configured to allow the outside of the cabinet and the receiving unit to communicate with each other therethrough. The laundry treating apparatus may be classified into a front loader type laundry treating apparatus and a top loader type laundry treating apparatus according to the position of the inlet. The front loader type laundry treating apparatus is defined as an apparatus having an inlet formed in a front panel of the cabinet, and the top loader type laundry treating apparatus can be defined as an apparatus having an inlet formed in a top panel of the cabinet.

[0004] The cabinet may be provided with a control panel. The control panel may be defined by a part of an outer surface of the cabinet or may be separately provided and installed such that at least a part thereof is exposed to the outside of the cabinet.

[0005] The control panel may be configured to provide various kinds of information to a user or to receive commands from the user. For example, the control panel may be configured to output a screen for providing visual information to the user, or may include buttons that are operated by the user to generate user operation signals.

[0006] In this regard, Korean Patent Publication No. KR10-1960309 discloses a control panel that can output a screen and is provided with buttons, etc. The control panel may include an output unit configured to output a screen for providing information to a user.

[0007] The output unit may be provided on the front panel of the cabinet together with the inlet. In this case, the output unit may be disposed above the inlet in consideration of ease of access and ease of operation for the user.

[0008] In the front loader type laundry treating apparatus, the output unit, a moving unit such as a detergent storage unit, and an option unit configured to provide option information may be disposed in an upper space of the front panel (the space located above the inlet). Therefore, in order to dispose all of the above components in a limited space while improving the visibility of the output unit and user convenience, the size and disposition of each component is an important design consideration.

[0009] That is, if the output unit occupies an excessively large area, not only will the appearance of the product be impaired in relation to the moving unit and the option unit, but the region where the moving unit and the option unit are disposed may be limited, which may impair user convenience. In addition, if the area of the output unit is excessively reduced, the visibility and convenience of the output unit may be impaired.

[0010] The present disclosure is to address at least the above-mentioned problems and/or disadvantages and to provide at least the advantages described below. Accordingly, an aspect of the present disclosure is to provide a laundry treating apparatus provided with an interface that is highly visible and easy to use.

[0011] Another aspect of the present disclosure is to provide a laundry treating apparatus that efficiently uses the space provided by a front panel and is provided with an interface that has high visibility and user convenience through the positions and shapes of components exposed on the front panel.

[0012] Additional aspects will be set forth in part in the description which follows and, in part, will be apparent from the description, or may be learned by practice of the presented embodiments of the disclosure.

[0013] A laundry treating apparatus according to an embodiment of the present disclosure includes a cabinet including a front panel, an inlet formed through the front panel, and an outlet located above the inlet, a door configured to open and close the inlet, a receiving unit configured to provide a receiving space for a target to be treated that is supplied to the inlet, a moving unit configured to be withdrawable from the outlet, the moving unit forming a liquid storage space or a flow path communicating with the receiving unit, and an input/output unit including a rotary input portion rotatably provided on the front panel, the rotary input portion being configured to allow a control command to be selected or input there-through, and an output portion located in the rotary input portion, the output portion being configured to output set information when the rotary input portion is rotated.

[0014] An upper end of the rotary input portion may be located at the same height as an upper end of the moving unit or higher than the upper end of the moving unit. That is, a horizontal line passing through the upper end of the rotary input portion may be configured to pass through a point higher than a horizontal line passing through the upper end of the moving unit, and may be set so as to have the same height as the horizontal line passing through the upper end of the moving unit.

[0015] An upper end of the output portion may be located at the same height as the upper end of the moving unit or higher than the upper end of the moving unit. That is, a horizontal line passing through the upper end of the output portion may be configured to pass through the upper end of the moving unit or a point higher than the upper end of the moving unit.

[0016] The moving unit may be configured to provide a flow path configured to connect a water source and the receiving unit to each other, a space configured to store detergent supplied to the receiving unit, or a space configured to store condensate discharged from the target to be treated.

[0017] The laundry treating apparatus may further include a steam generator configured to supply steam to the receiving unit, wherein the moving unit may be configured to provide a space configured to store water

supplied to the steam generator.

[0018] The width of the rotary input portion may be set to be equal to or greater than the shortest horizontal distance between the rotary input portion and the moving unit.

[0019] The height of the rotary input portion may be set to 1/11 to 1/10 of the height of the front panel.

[0020] The height of the rotary input portion may be set to 1/7 to 1/6 of the height of the door.

[0021] The height of the rotary input portion may be set to 0.8 to 0.9 times the height of the moving unit.

[0022] The height of the rotary input portion may be set to 3.4 to 3.9 times the shortest vertical distance between an upper end of the front panel and the upper end of the rotary input portion.

[0023] The height of the rotary input portion may be set to 3.5 to 4 times the shortest vertical distance between a lower end of the rotary input portion and an upper end of the door.

[0024] The shortest vertical distance between the upper end of the front panel and the lower end of the rotary input portion may be set to 1.2 to 1.4 times the height of the rotary input portion.

[0025] The shortest vertical distance between the upper end of the front panel and the upper end of the door may be set to 1.4 to 1.7 times the height of the rotary input portion.

[0026] The shortest vertical distance between the upper end of the front panel and the upper end of the moving unit may be set to 1 to 1.2 times the shortest vertical distance between the upper end of the front panel and the upper end of the rotary input portion.

[0027] The shortest vertical distance between the upper end of the front panel and the center of the moving unit may be set to 1 to 1.2 times the shortest vertical distance between the upper end of the front panel and the center of the rotary input portion.

[0028] The shortest vertical distance between the upper end of the front panel and the lower end of the rotary input portion may be set to 0.8 to 0.9 times the shortest vertical distance between the upper end of the front panel and the lower end of the moving unit.

[0029] The width of the rotary input portion may be set to 1/8 to 1/7 of the width of the front panel.

[0030] The distance between a vertical line passing through the center of the rotary input portion and a vertical line passing through the center of the front panel may be set to 1/28 to 1/22 of the width of the rotary input portion.

[0031] The width of the rotary input portion may be set to 1/7 to 1/6 of the width of the door.

[0032] The width of the rotary input portion may be set to 1.5 to 1.8 times the shortest horizontal distance between the rotary input portion and the moving unit.

[0033] The height of the front panel may be set to 37 to 39 times the shortest vertical distance between the upper end of the front panel and the upper end of the rotary input portion.

[0034] The height of the front panel may be set to 8 to

8.2 times the shortest vertical distance between the upper end of the front panel and the lower end of the rotary input portion.

[0035] The height of the front panel may be set to 6.6 to 6.8 times the shortest vertical distance between the upper end of the front panel and the upper end of the door.

[0036] The height of the front panel may be set to 1.1 to 1.2 times the shortest vertical distance between the upper end of the front panel and the lower end of the door.

[0037] The width of the front panel may be set to 3 to 3.1 times the width of the moving unit.

[0038] The shortest vertical distance between the upper end of the front panel and the upper end of the rotary input portion may be set to be greater than the shortest vertical distance between the lower end of the rotary input portion and the upper end of the door.

[0039] The laundry treating apparatus may further include a display unit fixed to the front panel so as to be located opposite the moving unit with respect to the rotary input portion, the display unit being configured to output information identical to the information output by the output portion or information different from the information output by the output portion, wherein an upper end of the display unit may be located lower than the upper end of the rotary input portion, and a lower end of the display unit may be located higher than the lower end of the rotary input portion. That is, a horizontal line passing through the upper end of the display unit may be configured to pass through a point lower than the upper end of the rotary input portion, and a horizontal line passing through the lower end of the display unit may be configured to pass through a point higher than the lower end of the rotary input portion.

[0040] The width of the rotary input portion may be set to be equal to or greater than the shortest horizontal distance between the rotary input portion and the display unit.

[0041] The width of the moving unit may be set to be equal to or greater than the shortest horizontal distance between the moving unit and the display unit.

[0042] The shortest horizontal distance between the moving unit and the display unit may be set to be equal to or less than the width of the moving unit.

[0043] The shortest horizontal distance between the moving unit and the display unit may be set to be equal to or less than the width of the moving unit.

[0044] The height of the display unit may be set to 1/22 to 1/20 of the height of the front panel.

[0045] The shortest vertical distance between the upper end of the front panel and the upper end of the rotary input portion may be set to 0.5 or less times the shortest vertical distance between the upper end of the front panel and the upper end of the display unit.

[0046] The shortest vertical distance between the upper end of the front panel and the upper end of the display unit may be set to 2 to 2.2 times the shortest vertical distance between the upper end of the front panel and the upper end of the rotary input portion.

[0047] The width of the display unit may be set to 1/4 to 1/3 of the width of the front panel.

[0048] The width of the rotary input portion may be set to 1.2 to 1.4 times the shortest horizontal distance between the rotary input portion and the display unit.

[0049] The shortest horizontal distance between the moving unit and the display unit may be set to 2.3 to 2.5 times the width of the rotary input portion.

[0050] The shortest horizontal distance between the moving unit and the display unit may be set to 0.9 to 1.1 times the width of the moving unit.

[0051] The shortest horizontal distance between the moving unit and the display unit may be set to 1.1 to 1.2 times the width of the display unit.

[0052] The laundry treating apparatus may further include a button input unit located between the rotary input portion and the moving unit or between the rotary input portion and the display unit, the button input unit being configured to receive a control command from a user.

[0053] The width of the button input unit may be set to be equal to or greater than the shortest horizontal distance between the rotary input portion and the button input unit.

[0054] The shortest horizontal distance between the rotary input portion and the button input unit may be set to be equal to or less than the shortest horizontal distance between an edge of the front panel and the moving unit.

[0055] The height of the button input unit may be set to 1/43 to 1/37 of the height of the front panel.

[0056] The height of the rotary input portion may be set to 3.6 to 4 times the height of the button input unit.

[0057] The shortest vertical distance between the upper end of the front panel and the upper end of the button input unit may be set to 2.4 to 2.6 times the shortest vertical distance between the upper end of the front panel and the upper end of the rotary input portion.

[0058] The width of the button input unit may be set to 1/29 or more of the width of the front panel.

[0059] The width of the rotary input portion may be set to 3.7 to 4 times the width of the button input unit.

[0060] The width of the rotary input portion may be set to 5 to 6 times the shortest horizontal distance between the rotary input portion and the button input unit.

[0061] The width of the rotary input portion may be set to 2.1 to 2.4 times the shortest horizontal distance between one end of the rotary input portion and the end of the button input unit far from the rotary input portion.

[0062] The width of the button input unit may be set to 1.3 to 1.6 times the shortest horizontal distance between the rotary input portion and the button input unit.

[0063] The shortest horizontal distance between the rotary input portion and the button input unit may be set to 0.7 to 0.9 times the shortest horizontal distance between the edge of the front panel and the moving unit.

[0064] The width of the rotary input portion may be set to 2.8 to 3.2 times the shortest horizontal distance between the second button and the display unit.

[0065] The width of the rotary input portion may be set

to 5.9 to 6.7 times the shortest horizontal distance between the first button and the moving unit.

[0066] The width of the rotary input portion may be set to 0.7 to 0.8 times the shortest horizontal distance between the first button and the second button.

[0067] The longest horizontal distance between the first button and the second button may be set to 1.8 to 2 times the width of the rotary input portion.

[0068] The longest horizontal distance between the first button and the second button may be set to 0.7 to 0.8 times the width of the moving unit.

[0069] The longest horizontal distance between the first button and the second button may be set to 0.9 to 1 times the width of the display unit.

[0070] The shortest horizontal distance between the second button and the display unit may be set to 1.9 to 2.2 times the shortest horizontal distance between the moving unit and the first button.

[0071] The laundry treating apparatus may further include a handle provided on the moving unit.

[0072] The lower end of the button input unit may be located between an upper end of the handle and the center of the handle. That is, a horizontal line passing through the lower end of the button input unit may be configured to pass between the upper end of the handle and the center of the handle.

[0073] The upper end of the handle may be located higher than the lower end of the button input unit. That is, a horizontal line passing through the upper end of the handle may be configured to pass through a point higher than the lower end of the button input unit.

[0074] The upper end of the handle may be located between the center of the moving unit and the lower end of the button input unit. That is, a horizontal line passing through the upper end of the handle may be configured to pass between the center of the moving unit and the lower end of the button input unit.

[0075] The lower end of the button input unit may be located between the upper end of the handle and the lower end of the display unit. That is, a horizontal line passing through the lower end of the button input unit may be configured to pass between the upper end of the handle and the lower end of the display unit.

[0076] The upper end of the handle may be located between the center of the button input unit and the lower end of the button input unit or between the center of the display unit and the lower end of the button input unit. That is, a horizontal line passing through the upper end of the handle may be configured to pass between the center of the button input unit and the lower end of the button input unit or may be configured to pass between the center of the display unit and the lower end of the button input unit.

[0077] The shortest vertical distance between the upper end of the front panel and the center of the handle may be set to 1.4 to 1.5 times the shortest vertical distance between the upper end of the front panel and the center of the rotary input portion.

[0078] The shortest vertical distance between the upper end of the front panel and the lower end of the rotary input portion may be set to 1.3 to 1.4 times the shortest vertical distance between the upper end of the front panel and the upper end of the handle.

[0079] The shortest vertical distance between the upper end of the front panel and the lower end of the rotary input portion may be set to 0.9 to 1 times the shortest vertical distance between the upper end of the front panel and the lower end of the handle.

[0080] The shortest vertical distance between the upper end of the front panel and the upper end of the rotary input portion may be set to 0.9 to 1.1 times the shortest vertical distance between the lower end of the rotary input portion and the upper end of the door.

[0081] The button input unit may include a first button located between the rotary input portion and the moving unit and a second button located between the rotary input portion and the display unit.

[0082] The shortest horizontal distance between the rotary input portion and the first button may be set to be equal to the shortest horizontal distance between the rotary input portion and the second button.

[0083] The shortest horizontal distance between the moving unit and the first button may be set to be less than the shortest horizontal distance between the second button and the display unit.

[0084] The width of the display unit may be set to be equal to or greater than the longest horizontal distance between the first button and the second button or may be set to be equal to or less than the shortest horizontal distance between the moving unit and the display unit.

[0085] The laundry treating apparatus may further include a service hole formed through the front panel, the service hole being located under the inlet, the service hole being configured to expose a pump provided in the cabinet, a heat exchanger provided in the cabinet, or a filter provided in the cabinet to the outside of the cabinet, and a service panel provided at the front panel, the service panel being configured to open and close the service hole.

[0086] The width of the front panel may be set to 4 to 4.2 times the width of the service panel.

[0087] As is apparent from the above description, the present disclosure provides a laundry treating apparatus provided with an interface that is highly visible and easy to use.

[0088] In addition, the present disclosure provides a laundry treating apparatus that efficiently uses the space provided by a front panel and is provided with an interface that has high visibility and user convenience through the positions and shapes of components exposed on the front panel.

[0089] The effects of the present disclosure are not limited to those mentioned above, and other unmentioned effects will be clearly understood by a person having ordinary skill in the art to which the present disclosure pertains from the above description.

FIGs. 1 and 2 show an example of a laundry treating apparatus.

FIG. 3 shows an example of an interface.

FIGs. 4, 5, and 6 show an example of an input/output unit and a button input unit.

FIG. 7 shows an example of a display unit.

FIGs. 8 to 11 show embodiments regarding disposition of the input/output unit, the button input unit, and the display unit.

[0090] The configuration and control method of an apparatus described below are intended to explain embodiments of the present disclosure and are not intended to limit the scope of the present disclosure. The same reference symbols used throughout the specification indicate the same components.

[0091] A singular representation may include a plural representation unless it represents a definitely different meaning from the context. It will be further understood that the terms "comprises", "includes", "has", and the like, when used in this specification, specify the presence of stated features, numbers, steps, operations, components, parts, or combinations thereof, but do not preclude the presence or addition of one or more other features, numbers, steps, operations, components, parts, or combinations thereof.

[0092] Expressions indicating relative or absolute arrangement, such as "in any direction," "in parallel", "vertically", "around", "concentric", or "coaxial", not only strictly indicate such arrangement but also indicate a state in which the relative displacement has a tolerance or an angle or distance that achieves the same function.

[0093] In addition, although terms including ordinal numbers, such as "first" and "second," may be used herein to describe various components, these components should not be limited by these terms. These terms are only used to distinguish one component from another component. Therefore, a first component may be named a second component, and similarly, a second component may be named a first component.

[0094] In addition, terms such as "front", "rear", "upper", "lower", "side", "front end", "rear end", "upper end", and "lower end" used herein are defined based on the drawings or based on the arrangement/placement of a component or between the components, and the shape and position of each component are not limited by these terms.

[0095] Hereinafter, a preferred embodiment of a laundry treating apparatus will be described in detail with reference to the accompanying drawings.

[0096] As shown in FIG. 1, the laundry treating apparatus 100 includes a cabinet 1 and an interface F provided in the cabinet 1. The interface F may be configured to receive control commands from a user or for providing information to the user.

[0097] The cabinet 1 may include a cabinet body 11 and a front panel 13 fixed to the cabinet body and forming a front surface of the laundry treating apparatus. When

legs for supporting the laundry treating apparatus 100 are provided on a bottom surface of the cabinet 1, the front panel 13 may be defined as a front surface of the laundry treating apparatus excluding the legs. In addition, when the front surface of the laundry treating apparatus 100 is formed by a combination of multiple panels, the front panel 13 may be defined as all of the multiple panels.

[0098] As shown in FIG. 2, the front panel 13 is provided with an inlet 131 configured to allow the inside and the outside of the cabinet 1 to communicate with each other therethrough. The inlet 131 may be opened and closed by a door 132 rotatably fixed to the cabinet 1. The door 132 may be formed in a circular shape having a constant diameter.

[0099] The cabinet 1 may be provided therein with a receiving unit 2 configured to receive a target to be treated, such as clothing. When the laundry treating apparatus is configured as an apparatus for washing the target to be treated, the receiving unit 2 may include a tub 2a provided in the cabinet 1 to store water and a drum 2b rotatably provided in the tub to receive the target to be treated.

[0100] The tub 2a may include a hollow cylindrical tub body 21. The tub body 21 may be fixed in the cabinet 1 via a tub support 22. FIG. 2 shows an example in which the tub support 22 includes a spring (connecting an upper space of the tub body to the cabinet) and a damper (connecting a lower space of the tub body to the cabinet).

[0101] A tub inlet 211 may be provided in the surface of the space provided by the tub body 21 facing the inlet 131, and the inlet 131 and the tub inlet 211 may be connected to each other via a gasket 212. The gasket 212 is made of an elastic material such as rubber, prevents water in the tub body 21 from being discharged into the cabinet 1, and minimizes the transmission of vibration of the tub body 21 to the cabinet 1.

[0102] The tub body 21 may be supplied with water through a water supply unit 23, and the water stored in the tub body 21 may be discharged to the outside of the cabinet 1 through a drain unit 25.

[0103] The drain unit 25 may include a pump 253 located lower than a bottom surface of the tub body 21, a first drain pipe 251 configured to connect the tub body 21 and the pump 253 to each other, and a second drain pipe 252 configured to guide water discharged from the pump 253 to the outside of the cabinet.

[0104] In order to filter the water discharged from the tub body 21, the laundry treating apparatus 100 may further include a filter 254 provided in the drain unit. The filter 254 may be configured to be withdrawable to the outside of the cabinet 1.

[0105] In order to withdraw the filter 254 or to remove residual water from the pump 253, the front panel 13 may further include a service hole (communication hole) 138 and a service panel 139 configured to open and close the service hole. The service hole 138 may be configured as a through-hole located under the inlet 131 (located under the door), and the service panel 139 may be configured

as a panel whose lower end is rotatably fixed to the front panel 13. The service hole 138 may be provided in any one of a left region and a right region of the space of the front panel 13 located under the door 132.

[0106] The water supply unit 23 may include a water supply pipe 231 configured to connect a water source located outside the cabinet and the tub body 21 to each other and a water supply valve 233 configured to control opening and closing of the water supply pipe 231.

[0107] Meanwhile, the laundry treating apparatus 100 may include a detergent supply unit 24 configured to store detergent to be supplied to the tub body 21 (the detergent supply unit may be omitted in some cases). When the detergent supply unit 24 is provided, the water supply pipe 231 may be configured to supply water to the tub body 21 through the detergent supply unit 24.

[0108] As shown in FIG. 3, the detergent supply unit 24 may include a housing 241 provided in the cabinet 1, a connecting pipe 244 configured to connect the housing to the tub body 21, a drawer (moving unit) 245 withdrawable from the housing 241 through an outlet (drawer inlet) 133 provided in the front panel 13.

[0109] As shown in FIG. 2, the housing 241 may include a housing body 241a configured to provide a space in which the drawer 245 is received and a housing cover 241b fixed to the housing body, the housing cover 241b being configured to form an upper surface of the housing.

[0110] In this case, a housing flow path may be provided in the housing cover 241b, and the housing flow path may be configured as a flow path for supplying water supplied from the water supply pipe 231 into the drawer 245.

[0111] The drawer 245 may include a chamber configured to provide a space in which detergent is stored and a discharge flow path 247 for discharging the detergent in the chamber to the housing body 241a. The discharge flow path 247 may be configured as a water trap (siphon flow path) for moving liquid to the housing body 241a when the level of the liquid stored in the chamber exceeds a preset level.

[0112] A drawer panel 248 may be provided on a front surface of the drawer 245. The drawer panel 248 may be configured to close the outlet 133, and a handle 249 may be provided on the drawer panel 248. The drawer panel 248 may form a part of the front panel 13 when the outlet 133 is closed.

[0113] The drum 2b may include a cylindrical drum body 26 located in the tub body 21. A drum inlet 261 is provided in the surface of the space provided by the drum body 26 facing the tub inlet 211. Therefore, a target to be treated may move to the drum body 26 via the inlet 131, the tub inlet 211, and the drum inlet 261.

[0114] The drum body 26 is provided with a drum through-hole 262 configured to allow the inside of the drum body and the inside of the tub body to communicate with each other therethrough. The drum through-hole 262 may be provided in each of a circumferential surface, a front surface (surface surrounding the drum inlet), and a

rear surface of the drum body 26. Therefore, water or detergent supplied into the tub body 21 may move to the drum body 26 via the drum through-hole 262.

[0115] The drum body 26 may be rotated by a driving unit 3. The driving unit 3 may include a stator 31 fixed to a rear surface of the tub body 21 to form a rotating magnetic field, a rotor 32 configured to be rotated by the rotating magnetic field, a rotary shaft 33 extending through the rear surface of the tub body 21 to connect the drum body 26 and the rotor 32 to each other.

[0116] As shown in FIG. 3, the front panel 13 may be fixed to the cabinet body 11 via the panel support 12. That is, the panel support 12 may be fixed to the cabinet body 11, and the front panel 13 may be fixed to the panel support 12. Unlike what is shown in the figure, the front panel 13 may be fixed directly to the cabinet body 11.

[0117] A controller may be provided in the cabinet 1. The controller may be configured to control at least one of the driving unit 3, the water supply valve 233, the pump 253, and the interface F.

[0118] FIG. 4 shows an example of the controller. The controller may be configured as a control board 4 provided with a control circuit. The control board 4 may be fixed to the front panel 13 via a case 41.

[0119] The case 41 may be provided with a position fixing portion 411 configured to set the position of the control board 4. In this case, the control board 4 may be provided with a board through-hole 42, into which the position fixing portion 411 is inserted, and the position fixing portion 411 may be provided with a case through-hole 413.

[0120] As shown in FIG. 3, the interface F may include an input/output unit 6, a display unit 7, and a button input unit 8 provided on the front panel 13 so as to be located above the door 132.

[0121] The button input unit 8 may be configured to receive control commands from a user, and the display unit 7 may be configured to output visual information or acoustic information. Meanwhile, the input/output unit 6 may be configured to allow input or selection of control commands and output of visual information or acoustic information.

[0122] The control board 4 may be configured to control at least one of the input/output unit 6, the display unit 7, and the button input unit 8. FIG. 4 shows the case where the control board 4 is configured to control the input/output unit 6 and the button input unit 8. In this case, the control board 4 may include an encoder 5 configured to control the input/output unit 6 and a detection sensor 43 and 44 configured to control the button input unit 8.

[0123] The encoder 5 may be configured to rotatably fix the input/output unit 6 to the control board 4 and to generate an electrical signal (or an electrical signal set differently according to the rotation angle of the input/output unit) upon rotation of the input/output unit 6.

[0124] The encoder 5 may include a stationary portion 51 fixed to the control board 4, a rotating portion 52 rotatably fixed to the stationary portion 51, and a signal

generating portion 54 configured to generate an electrical signal upon rotation of the rotating portion 52.

[0125] The stationary portion 51 may be fixed to the control board, and the stationary portion 51 may be provided with an encoder through-hole 53 connected to the board through-hole 42. The rotating portion 52 may be configured as a cylindrical rotating body rotatably coupled to the stationary portion 51.

[0126] The signal generating portion 54 may include a magnet fixed to the rotating portion 52, a sensor provided on the stationary portion 51 to detect magnetic force, and a terminal configured to connect the control circuit provided on the control board 4 and the sensor to each other. The magnet may be configured as a plurality of permanent magnets disposed along a circumferential surface of the rotating portion 52 so as to be spaced apart from each other.

[0127] The button input unit 8 may include at least one of a first button 81 and a second button 82. When the button input unit includes a first button 81 and a second button 82, the detection sensor may include a first detection sensor 43 connected to the first button and a second detection sensor 44 connected to the second button.

[0128] As shown in FIG. 3, the front panel 13 may be provided with a first button mounting hole 135 in which the first button 81 is mounted and a second button mounting hole 136 in which the second button 82 is mounted.

[0129] The first button 81 may be configured to input a control command requesting power supply to the laundry treating apparatus 100, and the second button 82 may be configured to input a control command requesting execution of a control command or a control command requesting temporary suspension of a control command being executed by the laundry treating apparatus 100.

[0130] The first button 81 and the second button 82 may have various shapes. The width and height of the first button 81 may be set to be equal to the width and height of the second button 82. The figure shows an example in which both buttons are circular, in which case the first button 81 and the second button 82 may have the same diameter. The distance between the first button 81 and the rotary input portion 6a may be set to be equal to the distance between the second button 82 and the rotary input portion 6a.

[0131] As shown in FIG. 4, the first detection sensor 43 may be configured to generate a control signal when the user's body comes into contact with the first button 81, and the second detection sensor 44 may be configured to generate a control signal when the user's body comes into contact with the second button 82.

[0132] The first button 81 and the second button 82 may be provided in a left space and a right space of the input/output unit 6, respectively. That is, the first button 81 may be located between the input/output unit 6 and the drawer panel 248, and the second button 82 may be located between the input/output unit 6 and the display unit 7.

[0133] Unlike what is shown in the figure, the first

button 81 and the second button 82 may be provided in an upper space and a lower space of the input/output unit 6, respectively. In addition, the button input unit 8 may include only one of the first button 81 and the second button 82.

[0134] The input/output unit 6 may include a rotary input portion 6a having one end located outside the front panel 13 and the other end connected to the rotating portion 52 of the encoder 5 through the front panel 13 and an output portion 6b having one end located outside the front panel 13 and the other end connected to the stationary portion 51 of the encoder through the front panel 13.

[0135] In order to mount the input/output unit 6, the front panel 13 may be provided with a panel through-hole 134. FIG. 3 shows an example in which the panel through-hole 134 is provided between the first button mounting hole 135 and the second button mounting hole 136. In consideration of user convenience, the panel through-hole 134, the first button mounting hole 135, and the second button mounting hole 136 are preferably located higher than the door 132.

[0136] As shown in FIG. 5, the rotary input portion 6a may include a first body 61 fixed to the rotating portion 52 through the front panel 13 and a second body 63 fixed to the first body 61 and located outside the cabinet 1.

[0137] The first body 61 may include a base 613 to which the second body 63 is fixed, a rotary shaft 611 inserted into the panel through-hole 134 to connect the base 613 to the rotating portion 52, and a rotating body through-hole 615 connected to the encoder through-hole 53 through the rotary shaft 611.

[0138] The second body 63 may be fixed to the first body 61 so as to be located outside the cabinet 1, and a user may supply the force necessary to rotate the first body 61 to the rotary shaft 611 through the second body 63.

[0139] The second body 63 may have a hollow cylindrical shape. The second body 63 may be provided with a receiving space 631 for mounting the output portion 6b, and the receiving space 631 may communicate with the outside through a second body through-hole 632 provided in one surface of the second body 63.

[0140] The output portion 6b may be configured to output set information when the rotary input portion 6a rotates, and the output portion 6b may be configured to output visual information and acoustic information.

[0141] The output portion 6b may be provided at a stationary body 64 fixed to the stationary portion 51 of the encoder and located inside the receiving space 631 of the rotary input portion 6a. The output portion 6b may include a display (first display) 67 fixed to the stationary body to display information (information related to control and operation of the laundry treating apparatus) and a control board (output portion board) 65 provided at the stationary body and having a circuit configured to control the first display 67.

[0142] The stationary body 64 may include a fastening

body 641 inserted into the rotating body through-hole 615 and the encoder through-hole 53 and fastened to the stationary portion 51 and a mounting space 643 in which the first display 67 and the output portion board 65 are mounted. The fastening body 641 may be provided with a fastening body through-hole 644 configured to connect the mounting space 643 and the board through-hole 42 to each other.

[0143] The output portion board 65 may be inserted into the mounting space 643, and a wire 652 connected to the output portion board 65 may be withdrawn out of the fixing body 64 through the fastening body through-hole 644. That is, one end of the wire 652 may be connected to the output portion board 65, and the other end of the wire 652 may extend into the cabinet 1 through the fastening body through-hole 644, the encoder through-hole 53, and the case through-hole 413. A plurality of lamps (light-emitting portions) 651 may be provided on the output portion board 65. The output portion board 65 may be supplied with power through the wire 652 or may communicate with the components in the cabinet 1.

[0144] The output portion board 65 may control the first display 67 such that preset information is displayed in accordance with the rotation of the rotary input portion 6a (in accordance with an electrical signal provided by the signal generating portion).

[0145] In order to maintain the distance between the output portion board 65 and the first display 67, to prevent damage to the lamps 651, and to guide light emitted from the lamps 651 to the outside of the mounting space 643, a support body 66 may be provided in the mounting space 643.

[0146] The support body 66 may be provided with a lamp through-hole 661 into which the lamps 651 are inserted and a connector through-hole 662. A connector (flexible PCB, etc.) 671 connected to the first display 67 may be inserted into the connector through-hole 662 so as to be connected to the output portion board 65.

[0147] In order to prevent foreign matter from entering the first display 67 and the output portion board 65, the input/output unit 6 may be further provided with an output portion cover 68. The output portion cover 68 may be fixed to the support body 66 or the stationary body 64 to close the second body through-hole 632 of the rotary input portion 6a.

[0148] As shown in FIG. 6, the output portion cover 68 may be provided with a light-transmitting region 681 and a light-blocking region 682 and 684.

[0149] The light-blocking region may include a first light-blocking region 682 located above the light-transmitting region 681 (located between the light-transmitting region and an upper end of the front panel) and a second light-blocking region 684 located under the light-transmitting region 681 (located between the light-transmitting region and the door). Unlike what is shown in the figure, the light-blocking region may include only one of the first light-blocking region 682 and the second light-blocking region 684.

[0150] In order to enable visual information to be viewed from outside the cabinet 1 through the light-transmitting region 681, the output region of the first display 67 may overlap the light-transmitting region 681. The output region may be defined as the region of the first display 67 where visual information is output.

[0151] The first display 67 may have various shapes as long as it is possible to output visual information, and may be configured as a rectangular LCD or LED panel as shown in the figure.

[0152] An upper end of the output region of the first display 67 may be set by an upper end of the light-transmitting region 681, and a lower end of the output region of the first display 67 may be set by a lower end of the light-transmitting region 681.

[0153] That is, a horizontal line passing through the upper end of the output region of the first display 67 may be configured to pass through the same point as the upper end of the light-transmitting region 681 or a point higher than the upper end of the light-transmitting region 681, and a horizontal line passing through the lower end of the output region of the first display 67 may be configured to pass through the same point as the lower end of the light-transmitting region 681 or a point lower than the lower end of the light-transmitting region 681.

[0154] Contrary to the above, the horizontal line passing through the upper end of the output region of the first display 67 may be configured to pass through a point lower than the upper end of the light-transmitting region 681, and the horizontal line passing through the lower end of the output region of the first display 67 may be configured to pass through a point higher than the lower end of the light-transmitting region 681.

[0155] Meanwhile, a left end of the output region of the first display 67 may be set by a left end of the light-transmitting region 681, and a right end of the output region may be set by a right end of the light-transmitting region 681. In this case, a third light-blocking region 687 may be provided in a left space of the light-transmitting region 681 between the first light-blocking region 682 and the second light-blocking region 684, and a fourth light-blocking region 688 may be provided in a right space of the light-transmitting region 681 between the first light-blocking region 682 and the second light-blocking region 684.

[0156] The light-blocking regions 682, 684, 687, and 688 may be configured as regions that prevent the inner space of the input/output unit 6 from being visible from the outside. In contrast, the light-blocking regions 682, 684, 687, and 688 may be configured as regions having a light transmission rate lower than that of the light-transmitting region 681 while allowing the inner space of the input/output unit 6 to be visible from the outside. That is, the light-transmitting region 681 may be configured as a region having a high light transmission rate, and the light-blocking regions 682, 684, 687, and 688 may be configured as regions having a low light transmission rate.

[0157] The first light-blocking region 682 may be provided with an indicator 683, and the second light-blocking region 684 may be provided with a first input portion 685 and a second input portion 686 configured to receive control commands from a user.

[0158] The indicator 683 may be configured to display information that is displayed on the first display 67 or information that is not displayed on the first display (control commands set in the laundry treating apparatus). FIG. 6 shows an example in which the indicator 683 is configured to display information such as whether Wi-Fi connection is established and whether the door 132 is locked. In consideration of visibility, the indicator 683 may be located above the lamps 651 fixed to the output portion board 65.

[0159] Since the input/output unit 6 of the interface F includes a rotary input portion 6a configured to allow control commands to be selected or input therethrough and an output portion 6b configured to output visual information, it is not necessary to print or display control commands selectable by the user through the rotation of the rotary input portion 6a in the space between the rotary input portion 6a and the drawer panel 248 and the space between the rotary input portion 6a and the display unit 7.

[0160] The first input portion 685 and the second input portion 686 may be configured as contact sensors configured to detect whether the user's body is in contact with the second light-blocking region 684.

[0161] FIG. 7 shows an example of the display unit 7 provided in the interface F. The display unit 7 may be configured to output information identical to the information output to the output portion 6b or information different from the information output to the output portion 6b (details of the information displayed on the output portion).

[0162] The display unit 7 may be provided in a cover mounting hole 137 provided in the front panel 13. The cover mounting hole 137 may be located above the door 132.

[0163] The display unit 7 may include a display (second display) 71 fixed in the cabinet 1 to output visual information and a display unit cover 72 configured to close the cover mounting hole 137 so as to form a part of the front panel 13. In this case, the display unit cover 72 may prevent foreign matter from entering the second display 71.

[0164] As shown in FIG. 8, a horizontal line KC passing through the center of the input/output unit 6 may be configured to pass between an upper end of the button input unit 8 and a lower end of the button input unit 8. In this case, the center of the input/output unit 6 and the center of the button input unit 8 may be located on the same horizontal line.

[0165] In order to effectively utilize an upper space of the front panel 13 (space located above the door), which is a limited space, and to improve the visibility and ease of use of the interface F, an upper end of the input/output unit 6 may be located at the same height as an upper end DT of the drawer panel 248 (an upper end of the moving unit)

or higher than the upper end DT of the drawer panel 248.

[0166] That is, a horizontal line KT passing through an upper end of the rotary input portion 6a may be configured to pass through a point at the same height as the upper end DT of the drawer panel or higher than the upper end DT of the drawer panel. Contrary to this, the interface F may be configured such that a horizontal line passing through an upper end of the output portion 6b passes through a point at the same height as the upper end DT of the drawer panel or higher than the upper end DT of the drawer panel.

[0167] When the input/output unit 6, which may receive a control command from a user and provide information to the user, is located higher than the other components of the interface F, visibility and ease of use may be improved.

[0168] Meanwhile, the lower end BB of the button input unit 8 may be located between an upper end HT of the handle 249 and the center HC of the handle. That is, a horizontal line BB passing through the lower end of the button input unit may be configured to pass between the upper end HT of the handle and the center HC of the handle.

[0169] The upper end HT of the handle 249 may be located higher than the lower end BB of the button input unit 8, and may be located between the center DC of the drawer panel 248 and the lower end BB of the button input unit.

[0170] In addition, the upper end HT of the handle may be located between the center BC of the button input unit 8 and the lower end BB of the button input unit, and may be located between the center WC of the display unit 7 and the lower end BB of the button input unit.

[0171] Meanwhile, the lower end BB of the button input unit 8 may be located between the upper end HT of the handle 249 and a lower end WB of the display unit 7.

[0172] In order to effectively utilize the upper space of the front panel 13 (space located above the door), which is a limited space, and to improve the visibility and ease of use of the interface F, the front panel 13 may be configured as shown in FIG. 9.

[0173] That is, the height h5 of the button input unit 8 may be set to 1/43 to 1/37 of the height H of the front panel, and the height h4 of the display unit 7 may be set to 1/22 to 1/20 of the height H of the front panel.

[0174] Meanwhile, the height h3 of the rotary input portion 6a may be set to 1/11 to 1/10 of the height H of the front panel, may be set to 1/7 to 1/6 of the height h6 of the door 132, may be set to 0.8 to 0.9 times the height h1 of the drawer panel 248, and may be set to 3.6 to 4 times the height h5 of the button input unit 8.

[0175] In addition, the height h3 of the rotary input portion may be set to 3.4 to 9 times the shortest vertical distance d1 between the upper end P of the front panel and the upper end of the rotary input portion 6a, and may be set to 3.5 to 4 times the shortest vertical distance d2 between a lower end of the rotary input portion 6a and an upper end of the door 132.

[0176] Contrary to the above, the height h3 of the rotary input portion may be set to 3.5 to 4 times the shortest vertical distance d2 between the lower end of the rotary input portion 6a and the upper end of the door 132.

[0177] The shortest vertical distance (d1+h3) between the upper end P of the front panel and the lower end of the rotary input portion 6a may be set to 1.2 to less than 1.4 times the height h3 of the rotary input portion, and the shortest vertical distance (d1+h3+d2) between the upper end P of the front panel and the upper end of the door 132 may be set to 1.4 to 1.7 times the height h3 of the rotary input portion.

[0178] The shortest vertical distance d3 between the upper end P of the front panel and the upper end of the drawer panel 248 may be set to be 1 to 1.2 times the shortest vertical distance d1 between the upper end P of the front panel and the upper end of the rotary input portion 6a, and the shortest vertical distance d4 between the upper end P of the front panel and the upper end of the button input unit 8 may be set to 2.4 to 2.6 times the shortest vertical distance d1 between the upper end P of the front panel and the upper end of the rotary input portion 6a.

[0179] As shown in FIG. 10, the shortest vertical distance d1 between the upper end P of the front panel and the upper end of the rotary input portion 6a may be set to 0.5 or less times the shortest vertical distance d5 between the upper end P of the front panel and the upper end of the display unit 7.

[0180] The shortest vertical distance d5 between the upper end P of the front panel and the upper end of the display unit 7 may be set to 2 to 2.2 times the shortest vertical distance d1 between the upper end P of the front panel and the upper end of the rotary input portion 6a.

[0181] The shortest vertical distance d7 between the upper end P of the front panel and the center of the drawer panel 248 may be set to 1 to 1.2 times the shortest vertical distance d6 between the upper end P of the front panel and the center of the rotary input portion 6a.

[0182] The shortest vertical distance d8 between the upper end P of the front panel and the center of the handle 249 may be set to 1.4 to 1.5 times the shortest vertical distance d6 between the upper end P of the front panel and the center of the rotary input portion 6a.

[0183] In addition, the shortest vertical distance (d1+h3) between the upper end P of the front panel and the lower end of the rotary input portion 6a may be set to 0.8 to 0.9 times the shortest vertical distance d9 between the upper end P of the front panel and a lower end of the drawer panel 248, may be set to 1.3 to 1.4 times the shortest vertical distance d10 between the upper end P of the front panel and the upper end of the handle 249, and may be set to 0.9 to 1 times the shortest vertical distance d11 between the upper end P of the front panel and the lower end of the handle 249.

[0184] Meanwhile, the shortest vertical distance d1 between the upper end P of the front panel and the upper end of the rotary input portion 6a may be set to be greater

than the shortest vertical distance d_2 between the lower end of the rotary input portion 6a and the upper end of the door 132. Contrary to this, the shortest vertical distance d_1 between the upper end P of the front panel and the upper end of the rotary input portion 6a may be set to 0.9 to 1.1 times the shortest vertical distance d_2 between the lower end of the rotary input portion 6a and the upper end of the door 132.

[0185] The height H of the front panel 13 may be set to 37 to 39 times the shortest vertical distance d_1 between the upper end P of the front panel and the upper end of the rotary input portion 6a, and may be set to 8 to 8.2 times the shortest vertical distance (d_1+h_3) between the upper end P of the front panel and the lower end of the rotary input portion 6a.

[0186] In addition, the height H of the front panel 13 may be set to 6.6 to 6.8 times the shortest vertical distance ($d_1+h_3+d_2$) between the upper end P of the front panel and the upper end of the door 132, and may be set to 1.1 to 1.2 times the shortest vertical distance ($d_1+h_3+d_2+h_6$) between the upper end P of the front panel and the lower end of the door 132.

[0187] In order to efficiently utilize the front panel, which has a limited width, and to improve the visibility and ease of use of the interface F, the front panel 13 may be configured as shown in FIG. 11.

[0188] That is, the width W of the front panel 13 may be set to 3 to 3.1 times the width W1 of the drawer panel 248, and may be set to 4 to 4.2 times the width W4 of the service panel 139.

[0189] Meanwhile, the width W5 of the button input unit 8 may be set to 1/29 or more of the width W of the front panel, and the width W3 of the display unit 7 may be set to 1/4 to 1/3 of the width W of the front panel. In addition, the width W2 of the rotary input portion 6a may be set to 1/8 to 1/7 of the width W of the front panel.

[0190] The distance between a vertical line VK passing through the center of the rotary input portion 6a and a vertical line VP passing through the center of the front panel 13 may be set to 1/28 to 1/22 of the width W2 of the rotary input portion 6a.

[0191] The door 132 may be formed in a shape having the same width dw_{10} and height h_6 , and FIG. 11 shows an example in which the door 132 is formed in a circular shape.

[0192] The width W2 of the rotary input portion 6a may be set to 1/7 to 1/6 of the width dw_{10} of the door 132, and may be set to 3.7 to 4 times the width W5 of the button input unit 8.

[0193] In addition, the width W2 of the rotary input portion 6a may be set to 5 to 6 times the shortest horizontal distance dw_5 between the rotary input portion 6a and the button input unit 8. FIG. 11 shows an example in which the width W2 of the rotary input portion 6a is set to 5 to 6 times the shortest horizontal distance between the rotary input portion 6a and the first button 81.

[0194] The width W2 of the rotary input portion 6a may be set to 2.1 to 2.4 times the shortest horizontal distance

dw_6 between one end of the rotary input portion 6a and the end of the button input unit 8 far from the rotary input portion 6a. FIG. 11 shows an example in which the width W2 of the rotary input portion 6a is set to 2.1 to 2.4 times the shortest horizontal distance dw_6 between a left end of the rotary input portion 6a and a left end of the first button 81.

[0195] Contrary to the above, the width W2 of the rotary input portion may be set to be equal to or greater than the shortest horizontal distance dw_7 between the rotary input portion 6a and the display unit 7. In this case, the width W2 of the rotary input portion may be set to 1.2 to 1.4 times the shortest horizontal distance dw_7 between the rotary input portion and the display unit.

[0196] In addition, the width W2 of the rotary input portion may be set to be equal to or greater than the shortest horizontal distance dw_8 between the rotary input portion 6a and the drawer panel 248. In this case, the width W2 of the rotary input portion may be set to 1.5 to 1.8 times the shortest horizontal distance dw_8 between the rotary input portion and the drawer panel.

[0197] The width W2 of the rotary input portion 6a may be set to 2.8 to 3.2 times the shortest horizontal distance dw_4 between the second button 82 and the display unit 7, may be set to 5.9 to 6.7 times the shortest horizontal distance dw_2 between the first button 81 and the drawer panel 248, and may be set to 0.7 to 0.8 times the shortest horizontal distance dw_{11} between the first button 81 and the second button 82.

[0198] The shortest horizontal distance dw_9 between the drawer panel 248 and the display unit 7 may be set to 2.3 to 2.5 times the width W2 of the rotary input portion.

[0199] The longest horizontal distance dw_3 between the first button 81 and the second button 82 may be set to 1.8 to 2 times the width W2 of the rotary input portion, and may be set to 0.7 to 0.8 times the width W1 of the drawer panel 248.

[0200] In addition, the longest horizontal distance dw_3 between the first button 81 and the second button 82 may be set to be equal to or less than the width W3 of the display unit. In this case, the longest horizontal distance dw_3 between the first button 81 and the second button 82 may be set to 0.9 to 1 times the width W3 of the display unit.

[0201] The shortest horizontal distance dw_9 between the drawer panel 248 and the display unit 7 may be set to be equal to or less than the width W1 of the drawer panel 248, may be set to 0.9 to 1.1 times the width W1 of the drawer panel 248, and may be set to 1.1 to 1.2 times the width W3 of the display unit 7.

[0202] The shortest horizontal distance dw_4 between the second button 82 and the display unit 7 may be set to 1.9 to 2.2 times the shortest horizontal distance dw_2 between the drawer panel 248 and the first button 81.

[0203] The shortest horizontal distance dw_2 between the drawer panel 248 and the first button 81 may be set to be less than the shortest horizontal distance dw_4 between the second button 82 and the display unit 7.

[0204] Meanwhile, the width W1 of the drawer panel 248 may be set to be equal to or greater than the shortest horizontal distance dw9 between the drawer panel 248 and the display unit 7.

[0205] The width W3 of the display unit 7 may be set to be equal to or greater than the longest horizontal distance dw3 between the first button 81 and the second button 82, and may be set to be equal to or less than the shortest horizontal distance dw9 between the drawer panel 248 and the display unit 7.

[0206] The width W5 of the button input unit 8 (the width of the first button or the second button) may be set to be equal to or greater than the shortest horizontal distance dw5 between the rotary input portion 6a and the button input unit 8. In this case, the width W5 of the button input unit may be set to 1.3 to 1.6 times the shortest horizontal distance dw5 between the rotary input portion 6a and the button input unit 8.

[0207] The shortest horizontal distance dw5 between the rotary input portion 6a and the button input unit 8 may be set to be equal or less than the shortest horizontal distance dw1 between an edge of the front panel 13 and the drawer panel 248. In this case, the shortest horizontal distance dw5 between the rotary input portion and the button input unit may be set to 0.7 to 0.9 times the shortest horizontal distance dw1 between the edge of the front panel and the drawer panel.

[0208] Although the laundry treating apparatus 100 according to the above embodiment is configured to wash a target to be treated, the laundry treating apparatus 100 may be configured to dry a target to be treated. In this case, the receiving unit 2 may include only a drum configured to receive the target to be treated.

[0209] Meanwhile, in order to dry a target to be treated, the laundry treating apparatus 100 may be provided with an air supply unit configured to supply air to the drum. The air supply unit may include a supply duct configured to supply air to the drum, a discharge duct configured to discharge air from the drum, a connecting duct configured to connect the supply duct and the discharge duct to each other, and a fan configured to move air.

[0210] The connecting duct may be provided with a first heat exchanger configured to remove moisture from air discharged from the drum and a second heat exchanger configured to heat the air that has passed through the first heat exchanger. In this case, the drawer (moving unit) 245 may be configured to store moisture (condensate) discharged from the air passing through the first heat exchanger.

[0211] That is, when the laundry treating apparatus 100 is configured to wash a target to be treated, the drawer 245 may be configured to store detergent or to form a flow path communicating with the tub body 21. However, when the laundry treating apparatus 100 is configured to dry a target to be treated, the drawer 245 may be configured to store liquid such as condensate (as a liquid storage space).

[0212] In order to move condensate in the air supply

unit to the drawer 245, the laundry treating apparatus may be provided with a condensate pump. In this case, the service hole 138 may be configured to clean the first heat exchanger or to expose the condensate pump to the outside of the cabinet. In this case, a user may clean the first heat exchanger and remove residual water from the condensate pump through the service hole.

[0213] Meanwhile, the laundry treating apparatus 100 may be provided with a steam generator disposed in the cabinet to supply steam to a target to be treated. In this case, the drawer 245 may be configured to supply water to the steam generator (as a liquid storage space).

[0214] The laundry treating apparatus is an example of the present disclosure, and the scope of the present disclosure is not limited to the structure or the control method described above.

Claims

1. A laundry treating apparatus comprising:

a cabinet comprising a front panel, an inlet formed through the front panel, and an outlet located above the inlet;
a door configured to open and close the inlet;
a receiving unit configured to provide a receiving space for a target to be treated that is supplied to the inlet;
a moving unit configured to be withdrawable from the outlet, the moving unit forming a liquid storage space or a flow path communicating with the receiving unit; and
an input/output unit comprising a rotary input portion rotatably provided on the front panel, the rotary input portion being configured to allow a control command to be selected or input there-through, and an output portion located in the rotary input portion, the output portion being configured to output set information when the rotary input portion is rotated, wherein an upper end of the rotary input portion is located at the same height as an upper end of the moving unit or higher than the upper end of the moving unit.

2. The laundry treating apparatus of claim 1, wherein a width of the rotary input portion is set to be equal to or greater than a shortest horizontal distance between the rotary input portion and the moving unit.

3. The laundry treating apparatus of claim 1, or 2, wherein a shortest vertical distance between an upper end of the front panel and the upper end of the rotary input portion is set to be greater than a shortest vertical distance between a lower end of the rotary input portion and an upper end of the door.

4. The laundry treating apparatus of claim 1, 2, or 3, further comprising:

a display unit fixed to the front panel so as to be located opposite the moving unit with respect to the rotary input portion, the display unit being configured to output information identical to the information output by the output portion or information different from the information output by the output portion, wherein
an upper end of the display unit is located lower than the upper end of the rotary input portion, and
a lower end of the display unit is located higher than a lower end of the rotary input portion.

5. The laundry treating apparatus of claim 4, wherein a width of the rotary input portion is set to be equal to or greater than a shortest horizontal distance between the rotary input portion and the display unit.

6. The laundry treating apparatus of claim 4, or 5 wherein a width of the moving unit is set to be equal to or greater than a shortest horizontal distance between the moving unit and the display unit.

7. The laundry treating apparatus of claim 4, 5, or 6, wherein a shortest horizontal distance between the moving unit and the display unit is set to be equal to or less than a width of the moving unit.

8. The laundry treating apparatus of any one of claims 4 to 7, further comprising:

a button input unit located between the rotary input portion and the moving unit or between the rotary input portion and the display unit, the button input unit being configured to receive a control command from a user, wherein
a width of the button input unit is set to be equal to or greater than a shortest horizontal distance between the rotary input portion and the button input unit.

9. The laundry treating apparatus of claim 8, wherein the shortest horizontal distance between the rotary input portion and the button input unit is set to be equal to or less than a shortest horizontal distance between an edge of the front panel and the moving unit.

10. The laundry treating apparatus of claim 8, or 9, further comprising:

a handle provided on the moving unit, wherein a lower end of the button input unit is located between an upper end of the handle and a center of the handle.

11. The laundry treating apparatus of claim 10, wherein the upper end of the handle is located between a center of the moving unit and the lower end of the button input unit.

12. The laundry treating apparatus of claim 10, or 11, wherein the lower end of the button input unit is located between the upper end of the handle and the lower end of the display unit.

13. The laundry treating apparatus of claim 10, 11, or 12, wherein the upper end of the handle is located between a center of the button input unit and the lower end of the button input unit or between a center of the display unit and the lower end of the button input unit.

14. The laundry treating apparatus of any one of claims 8 to 13, wherein

the button input unit comprises a first button located between the rotary input portion and the moving unit and a second button located between the rotary input portion and the display unit, and
a shortest horizontal distance between the rotary input portion and the first button is equal to a shortest horizontal distance between the rotary input portion and the second button.

15. The laundry treating apparatus of claim 14, wherein a shortest horizontal distance between the moving unit and the first button is set to be less than a shortest horizontal distance between the second button and the display unit.

16. The laundry treating apparatus of claim 14, or 15, wherein a width of the display unit is set to be equal to or greater than a longest horizontal distance between the first button and the second button or is set to be equal to or less than a shortest horizontal distance between the moving unit and the display unit.

Amended claims in accordance with Rule 137(2) EPC.

1. A laundry treating apparatus comprising:

a cabinet (1) comprising a front panel (13), an inlet (131) formed through the front panel (13), and an outlet (133) located above the inlet (131);
a door (132) configured to open and close the inlet (131);
a receiving unit (2) configured to provide a receiving space for a target to be treated that is supplied to the inlet (131);
a moving unit (245) configured to be withdrawable from the outlet (133), the moving unit (245)

- forming a liquid storage space or a flow path communicating with the receiving unit (2); and an input/output unit (6) comprising a rotary input portion (6a) rotatably provided on the front panel (13), the rotary input portion (6a) being configured to allow a control command to be selected or input therethrough, and an output portion (6b) located in the rotary input portion (6a), the output portion (6b) being configured to output set information when the rotary input portion (6a) is rotated, wherein
- characterized in that:**
- an upper end (KT) of the rotary input portion (6a) is located at the same height as an upper end (DT) of the moving unit (245) or higher than the upper end (DT) of the moving unit (245), and a shortest vertical distance (d1) between an upper end (P) of the front panel (13) and the upper end (KT) of the rotary input portion (6a) is set to be greater than a shortest vertical distance (d2) between a lower end of the rotary input portion (6a) and an upper end of the door (132).
2. The laundry treating apparatus of claim 1, wherein a width (W2) of the rotary input portion (6a) is set to be equal to or greater than a shortest horizontal distance (dw8) between the rotary input portion (6a) and the moving unit (245).
 3. The laundry treating apparatus of claim 1 or 2, further comprising:

a display unit (7) fixed to the front panel (13) so as to be located opposite the moving unit (245) with respect to the rotary input portion (6a), the display unit (7) being configured to output information identical to the information output by the output portion (6b) or information different from the information output by the output portion (6b), wherein

an upper end of the display unit (7) is located lower than the upper end (KT) of the rotary input portion (6a), and

a lower end (WB) of the display unit (7) is located higher than a lower end of the rotary input portion (6a).
 4. The laundry treating apparatus of claim 3, wherein a width (W2) of the rotary input portion (6a) is set to be equal to or greater than a shortest horizontal distance (dw7) between the rotary input portion (6a) and the display unit (7).
 5. The laundry treating apparatus of claim 3 or 4, wherein a width (W1) of the moving unit (245) is set to be equal to or greater than a shortest horizontal distance (dw9) between the moving unit (245) and the display unit (7).
 6. The laundry treating apparatus of claim 3, 4 or 5, wherein a shortest horizontal distance (dw9) between the moving unit (245) and the display unit (7) is set to be equal to or less than a width (W1) of the moving unit (245).
 7. The laundry treating apparatus of any one of claims 3 to 6, further comprising:

a button input unit (8) located between the rotary input portion (6a) and the moving unit (245) or between the rotary input portion (6a) and the display unit (7), the button input unit (8) being configured to receive a control command from a user, wherein

a width (W5) of the button input unit (8) is set to be equal to or greater than a shortest horizontal distance (dw5) between the rotary input portion (6a) and the button input unit (8).
 8. The laundry treating apparatus of claim 7, wherein the shortest horizontal distance (dw5) between the rotary input portion (6a) and the button input unit (8) is set to be equal to or less than a shortest horizontal distance (dw1) between an edge of the front panel (13) and the moving unit (245).
 9. The laundry treating apparatus of claim 7 or 8, further comprising:

a handle (249) provided on the moving unit (245), wherein

a lower end (BB) of the button input unit (8) is located between an upper end (HT) of the handle (249) and a center (HC) of the handle (249).
 10. The laundry treating apparatus of claim 9, wherein the upper end (HT) of the handle (249) is located between a center (DC) of the moving unit (245) and the lower end (BB) of the button input unit (8).
 11. The laundry treating apparatus of claim 9 or 10, wherein the lower end (BB) of the button input unit (8) is located between the upper end (HT) of the handle (249) and the lower end (WB) of the display unit (7).
 12. The laundry treating apparatus of claim 9, 10 or 11, wherein the upper end (HT) of the handle (249) is located between a center (BC) of the button input unit (8) and the lower end (BB) of the button input unit (8) or between a center (WC) of the display unit (7) and the lower end (BB) of the button input unit (8).
 13. The laundry treating apparatus of any one of claims 7 to 12, wherein

the button input unit (8) comprises a first button

(81) located between the rotary input portion (6a) and the moving unit (245) and a second button (82) located between the rotary input portion (6a) and the display unit (7), and a shortest horizontal distance (dw6) between the rotary input portion (6a) and the first button (81) is equal to a shortest horizontal distance between the rotary input portion (6a) and the second button (82).

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14. The laundry treating apparatus of claim 13, wherein a shortest horizontal distance (dw2) between the moving unit (245) and the first button (81) is set to be less than a shortest horizontal distance (dw4) between the second button (82) and the display unit (7).

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15. The laundry treating apparatus of claim 13 or 14, wherein a width (W3) of the display unit (7) is set to be equal to or greater than a longest horizontal distance (dw3) between the first button (81) and the second button (82) or is set to be equal to or less than a shortest horizontal distance (dw9) between the moving unit (245) and the display unit (7).

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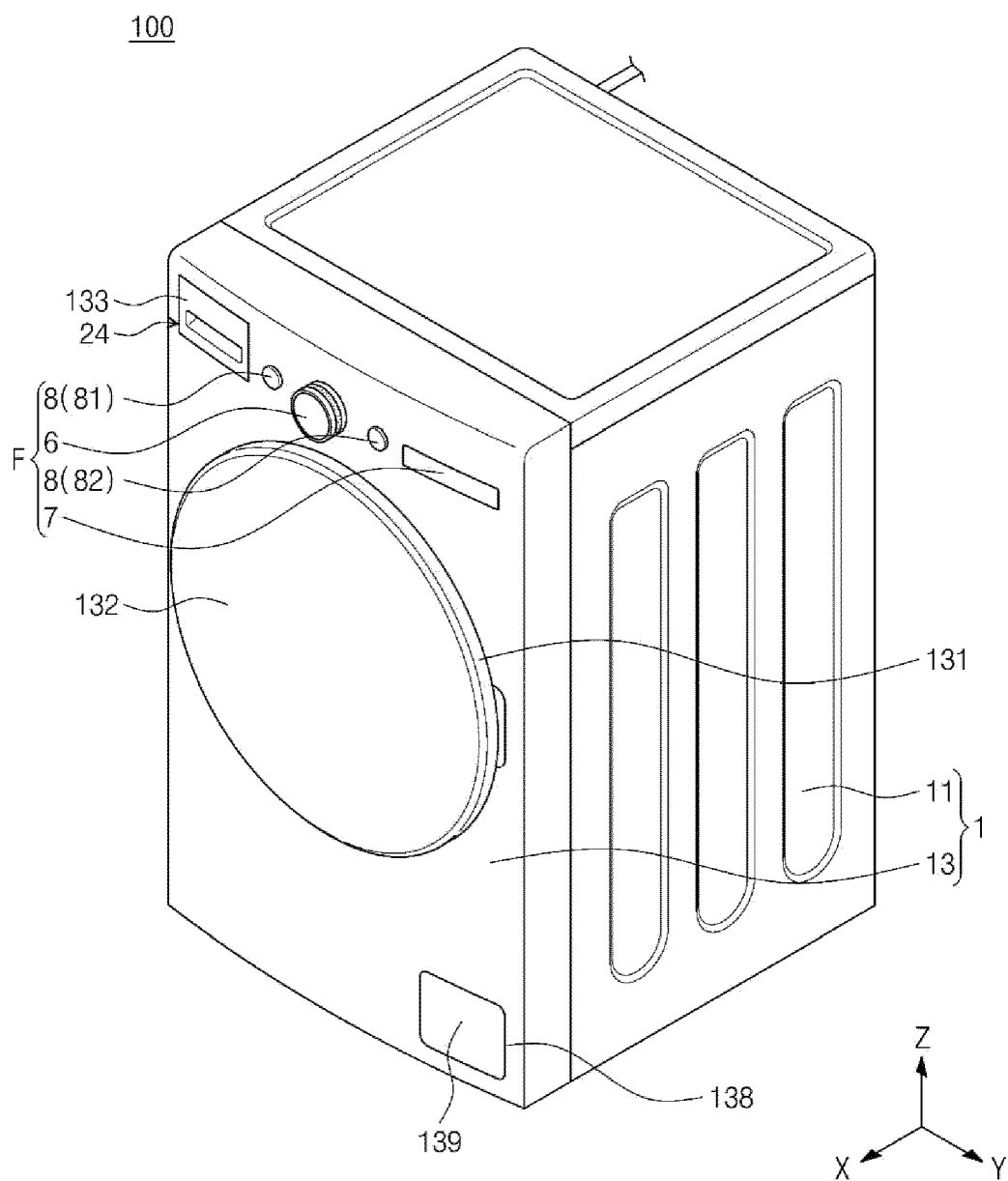
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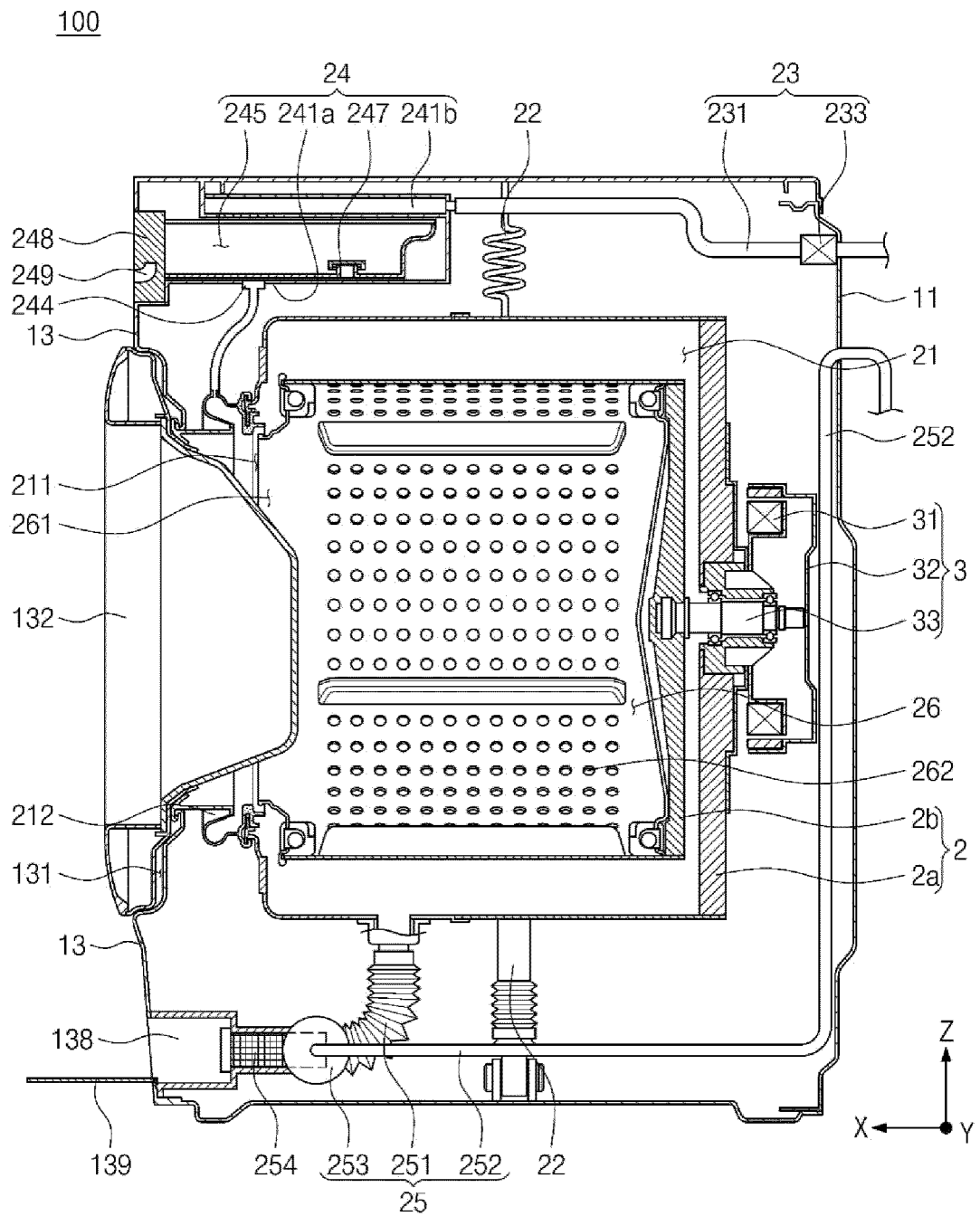
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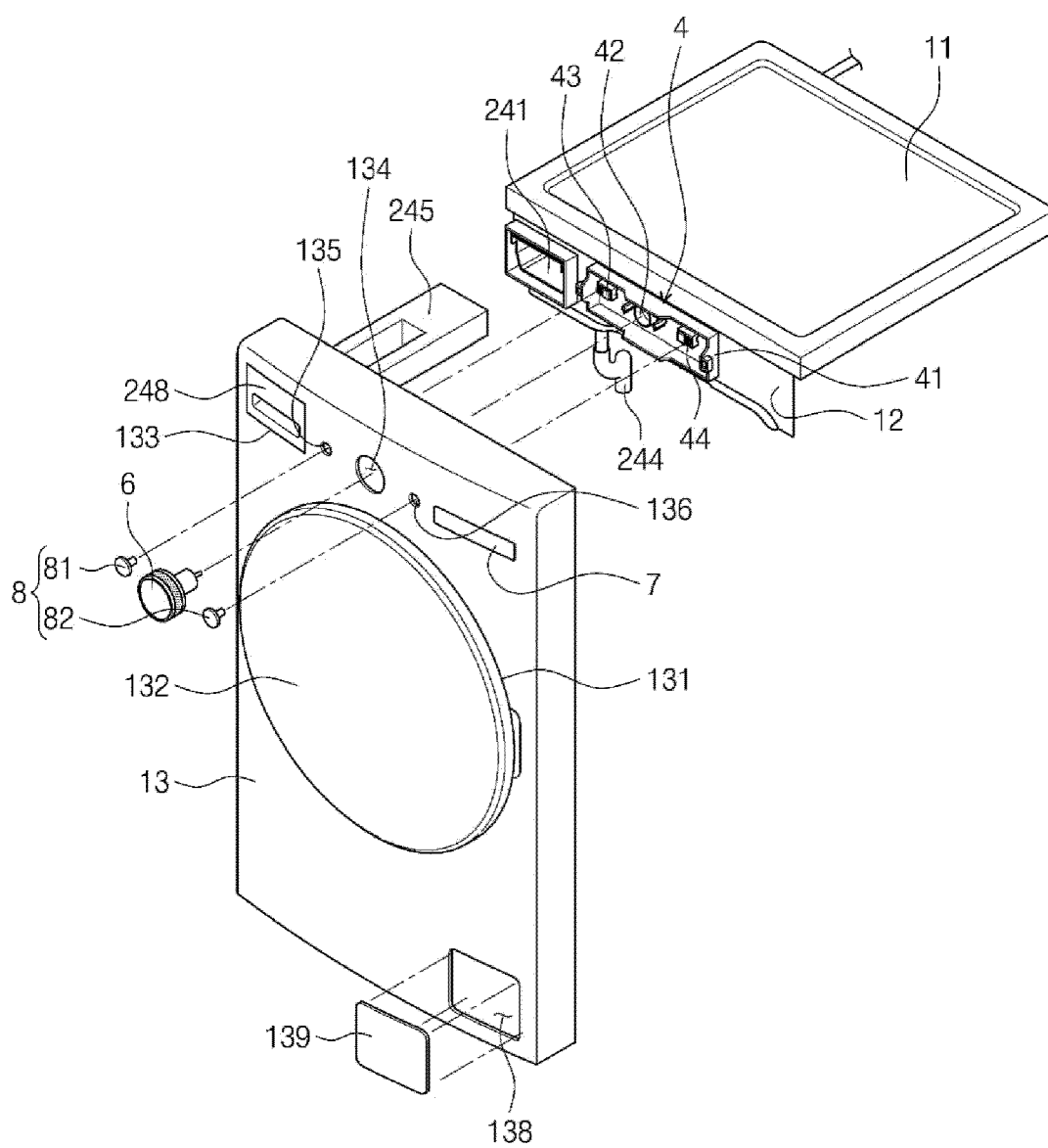
【Figure 1】



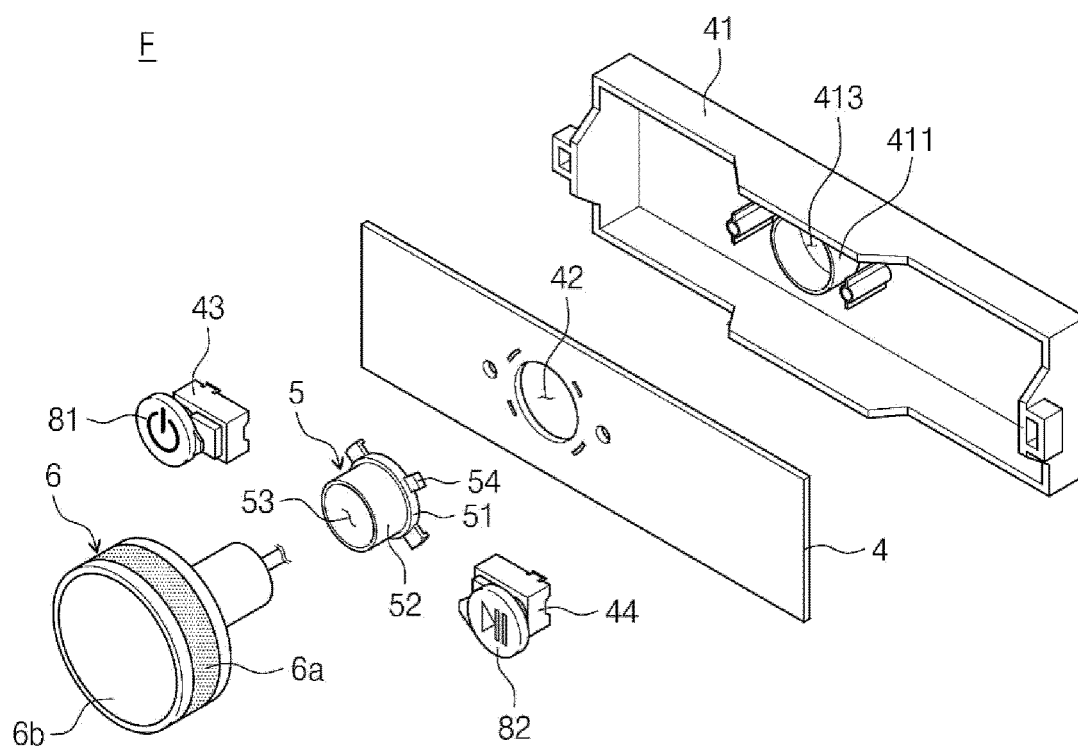
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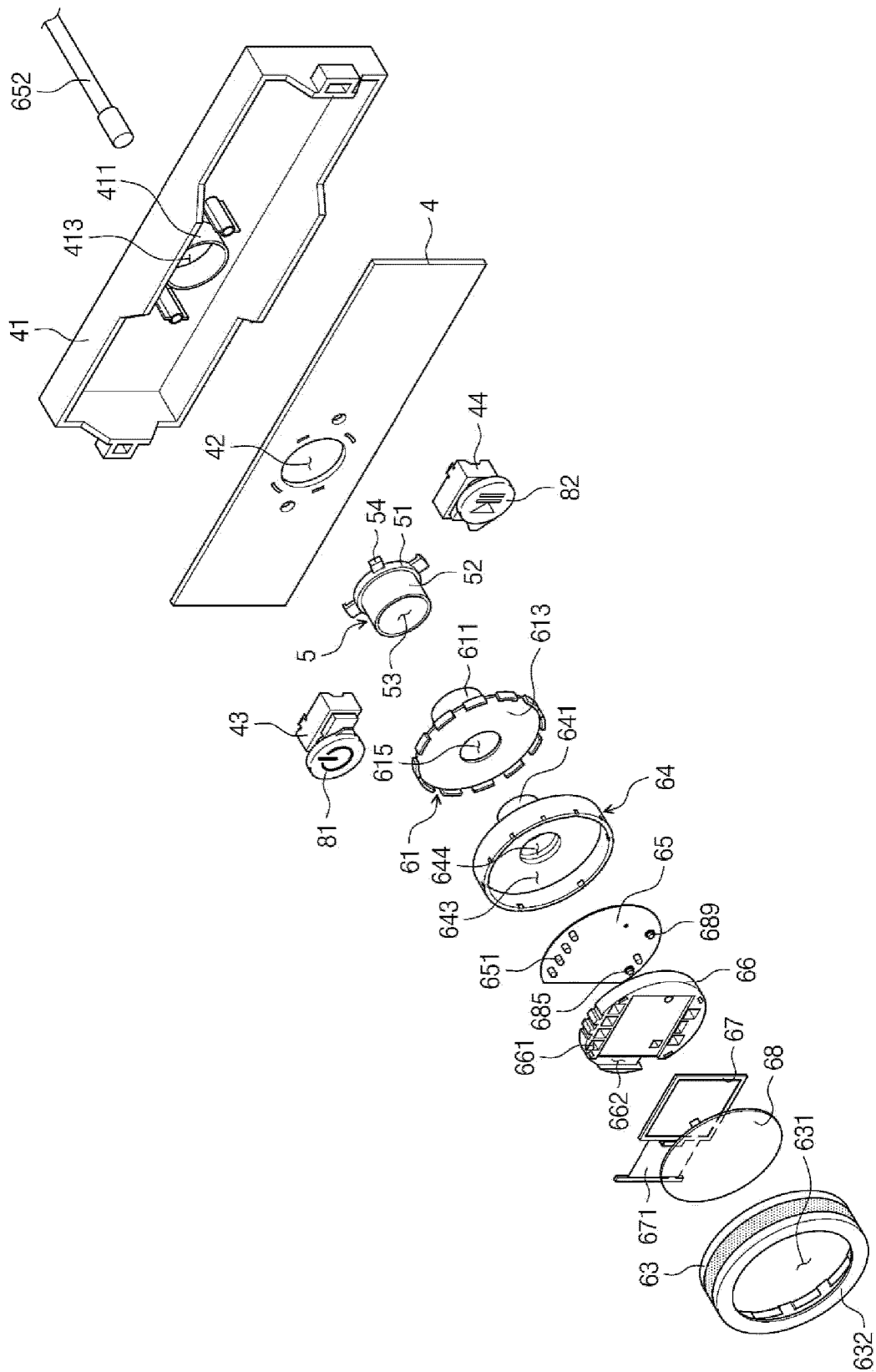
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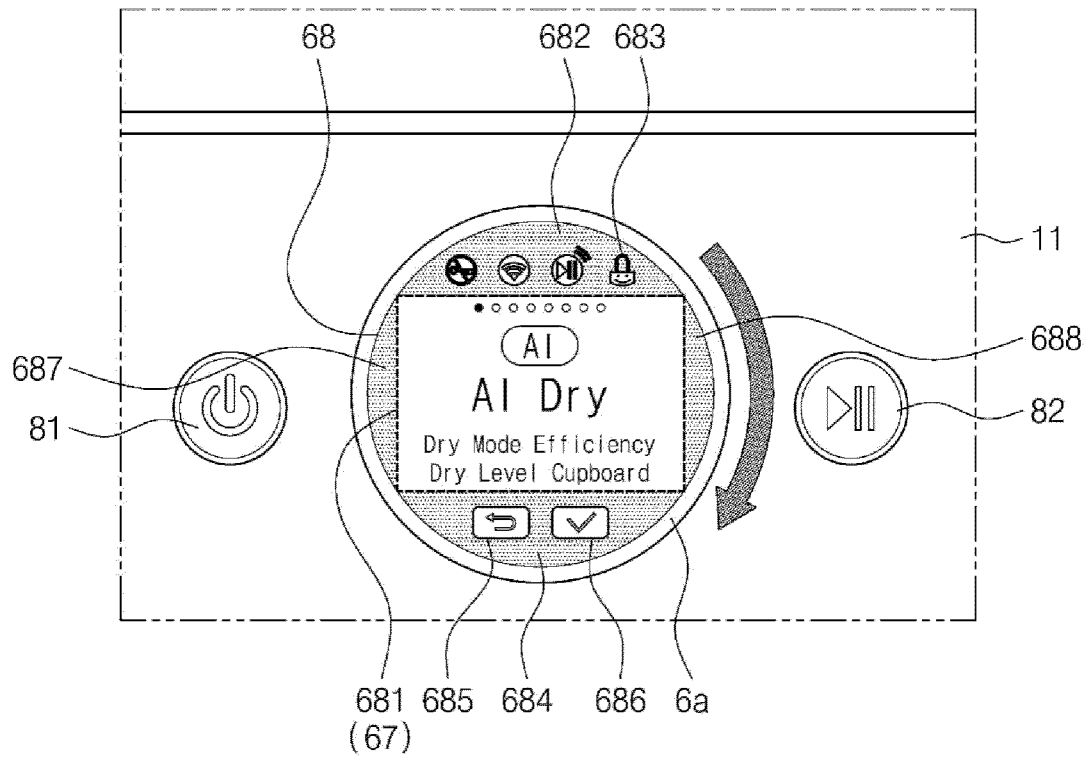
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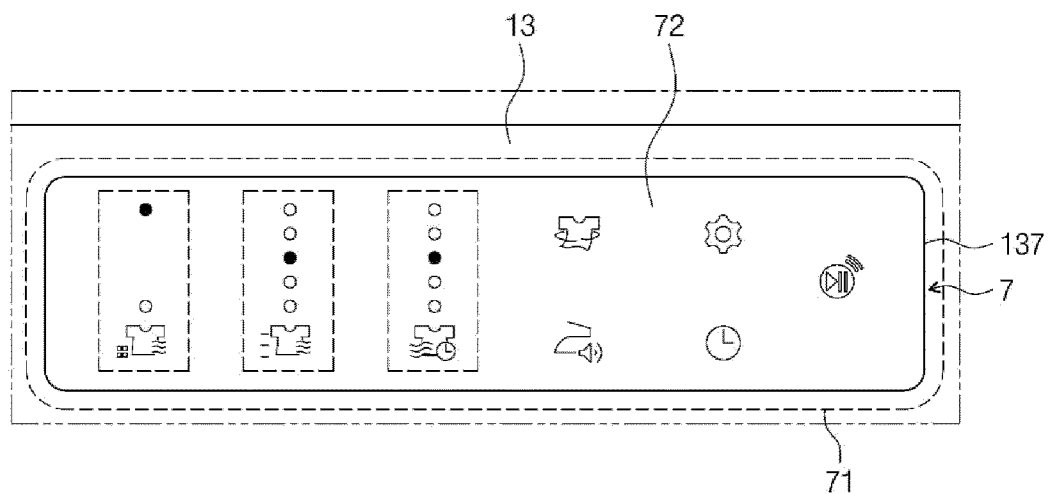
【Figure 5】



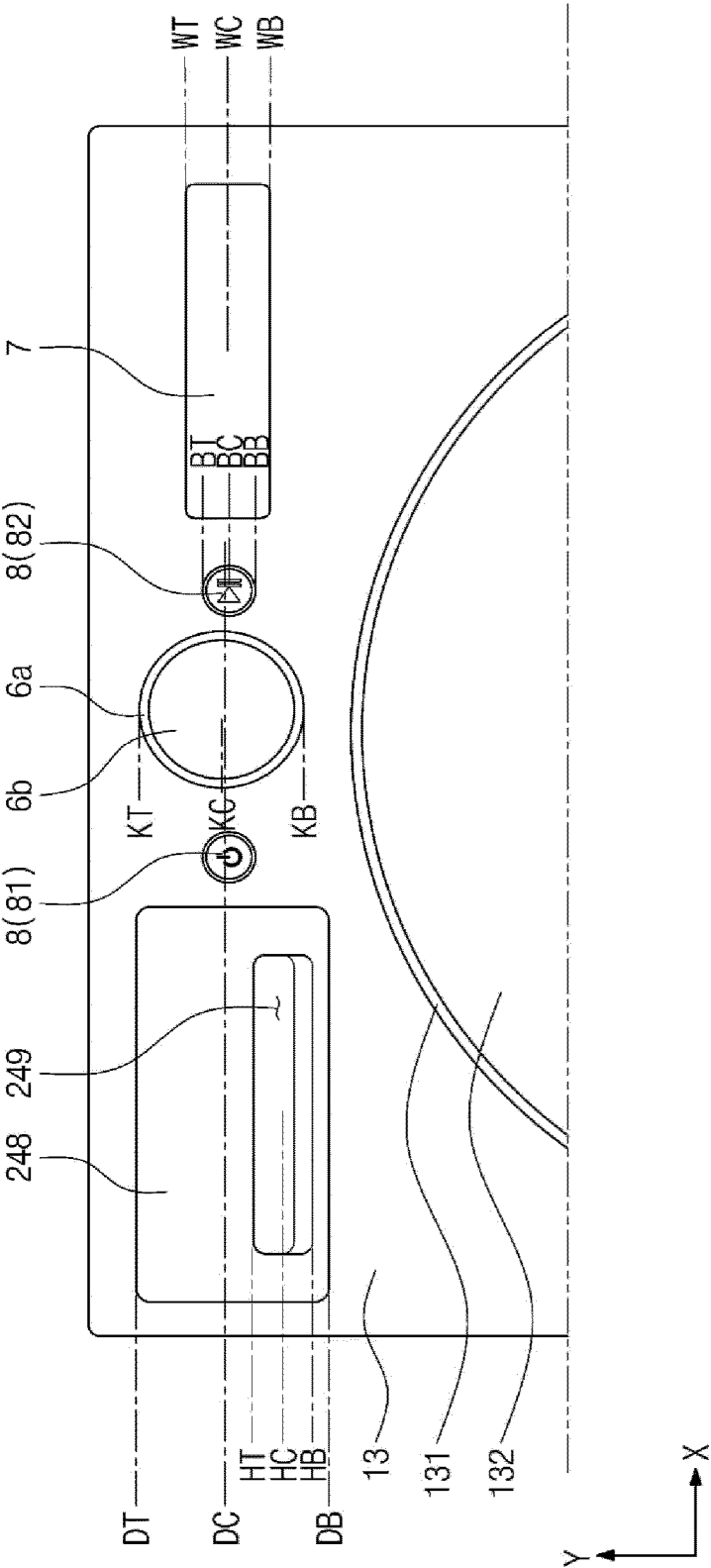
【Figure 6】



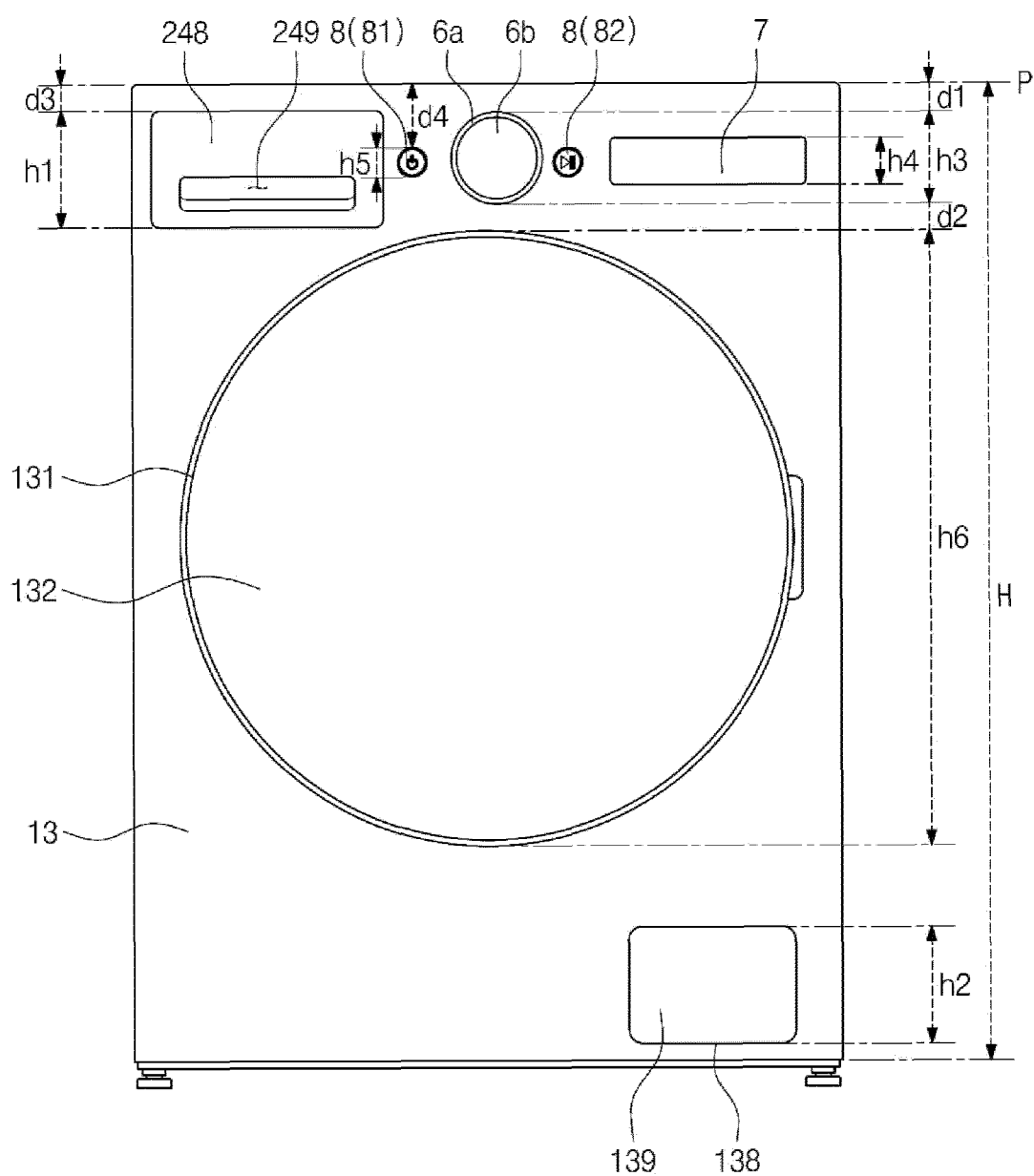
【Figure 7】



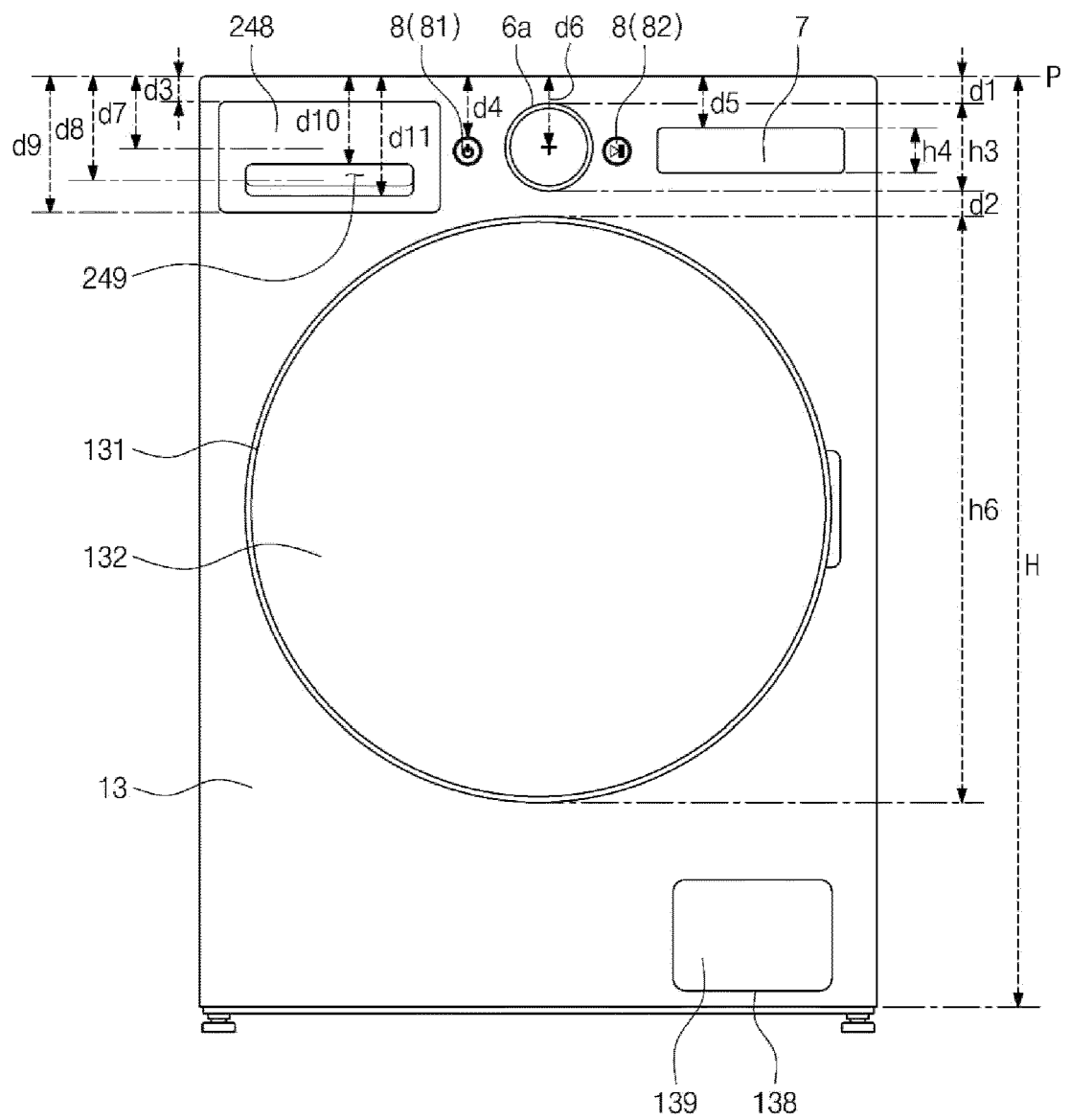
【Figure 8】



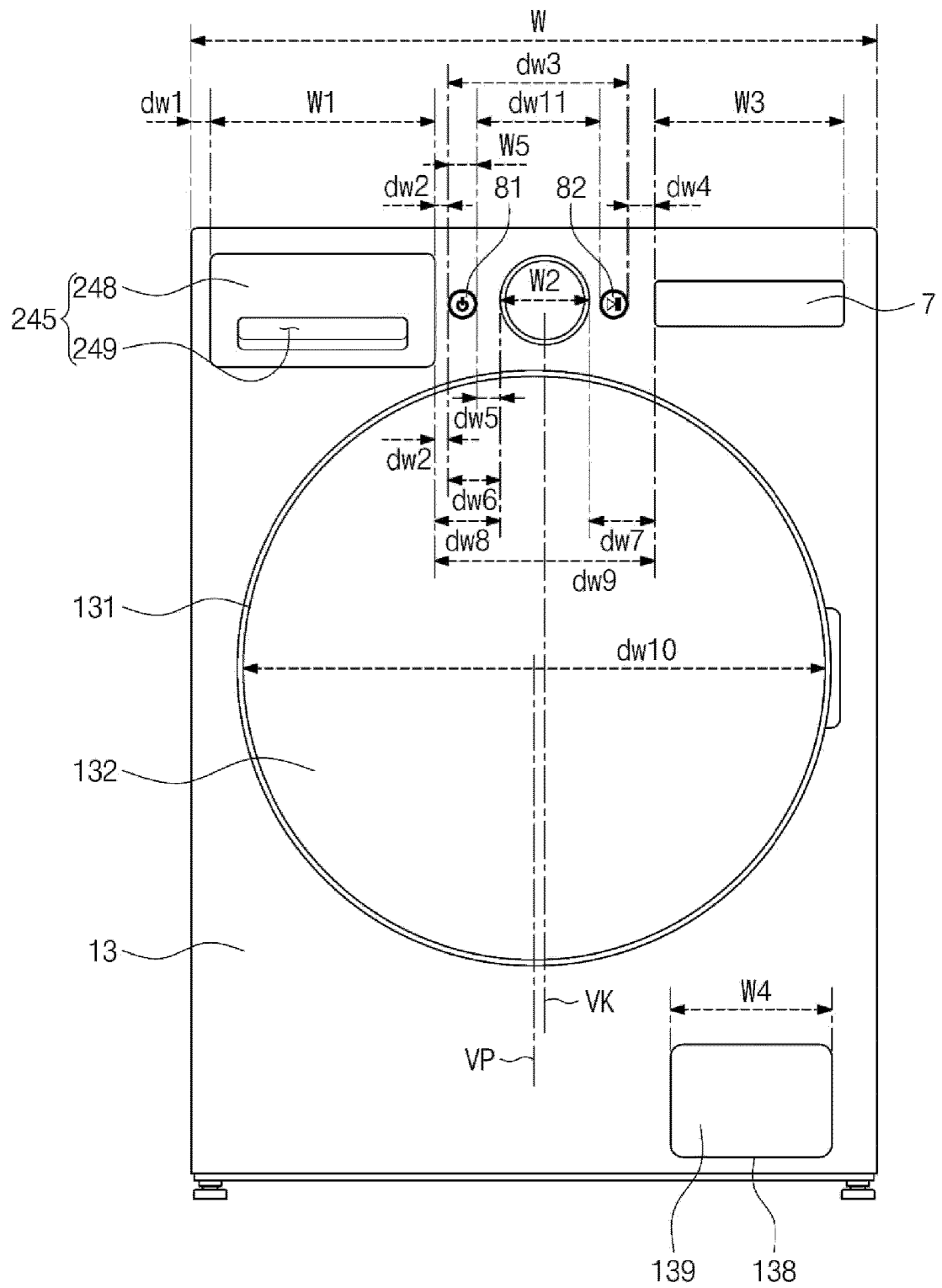
【Figure 9】



【Figure 10】



【Figure 11】





EUROPEAN SEARCH REPORT

Application Number

EP 25 17 4987

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2024/295064 A1 (CHOE DAMI [KR]) 5 September 2024 (2024-09-05) * paragraphs [0066] - [0094] * * paragraphs [0110] - [0121] * * claim 31; figures 1-22 * -----	1-16	INV. D06F34/30 D06F34/32 D06F39/02 D06F39/12
A	KR 2023 0001306 A (LG ELECTRONICS INC [KR]) 4 January 2023 (2023-01-04) * paragraphs [0014] - [0018] * * paragraphs [0112] - [0137] * * figures 1-8 * -----	1-16	ADD. D06F23/02 D06F58/02 D06F58/20 D06F58/24
			TECHNICAL FIELDS SEARCHED (IPC)
			D06F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		13 January 2026	Weinberg, Ekkehard
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