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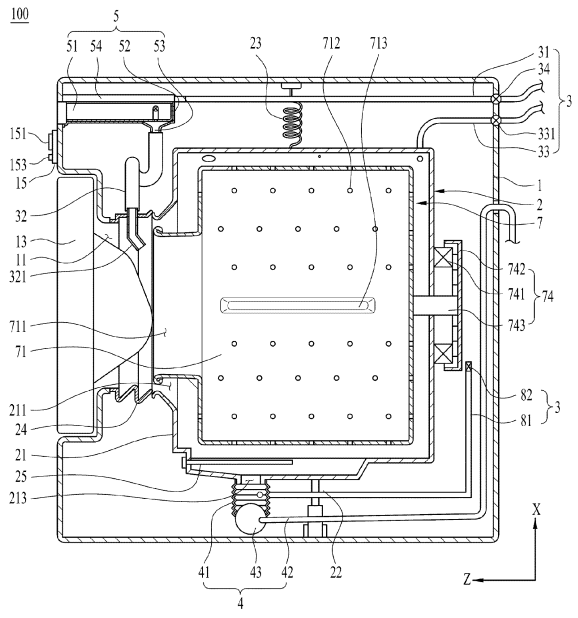
(54) CLOTHES TREATMENT APPARATUS

(57) **Abstarct:** Provided is a method for controlling a clothes treatment apparatus comprising: a tub for storing water; a drum rotatably provided in the tub so as to store objects to be washed; a detergent storage part for storing detergent; a storage part water supply pipe for supplying the water to the detergent storage part; a tub connection pipe for guiding, into the tub, the water discharged from the detergent storage part; a tub water supply pipe for supplying the water to the tub; a drain port penetrating the tub; and a drain pump connected to the drain port.

[FIG. 1]



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Description

[Technical Field]

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

[Background]

[0002] A laundry treating apparatus is a concept including a washing machine that removes foreign substances from an object-to-be-washed (laundry or the like) and a dryer that removes water from an object-to-be-dried (wet laundry or the like).

[0003] There was a conventional laundry treating apparatus capable of washing including a tub that stores water therein, a drum that is rotatably disposed inside the tub and accommodates the object-to-be-washed therein, a water supply that supplies water to the tub, a drainage that drains water stored in the tub, and a detergent storage that stores a detergent to be supplied to the tub therein.

[0004] There was the detergent storage disposed in the conventional laundry treating apparatus that is disposed on a water flow channel provided by the water supply. Because the flow channel provided by the water supply is disposed to connect a water supply source with the tub via the detergent storage, the detergent storage of the above structure was able to supply water and the detergent to the tub together during operation of the water supply.

[0005] In one example, the drainage disposed in the conventional laundry treating apparatus was constructed to include a drain pump located outside the tub, a first drain pipe that guides water inside the tub to the drain pump, and a second drain pipe that guides water drained from the drain pump to a sewer.

[0006] In the laundry treating apparatus including the detergent storage and the drainage of the above-described structures, there was a case in which it is difficult to dissolve the detergent supplied to the tub in water.

[0007] The conventional laundry treating apparatus may dissolve the detergent in water by rotating the drum to form a water flow inside the tub. When water and the detergent are supplied together to the tub via the operation of the water supply, a portion of the detergent put into the tub may be discharged to the first drain pipe. In this case, even when the drum rotates, it is difficult for the detergent (the detergent discharged from the tub) that has flowed to the first drain pipe to flow back into the tub, so that the conventional laundry treating apparatuses had problems such as a difficulty in dissolving the detergent in water and inability to wash well even when an appropriate amount of detergent was added (a problem of requiring a lot of detergent for the washing).

[Summary]

[Technical Problem]

[0008] The present disclosure is to provide a laundry treating apparatus and a method for controlling the laundry treating apparatus that may prevent deterioration in a washing performance resulted from a lack of detergent.

[0009] In addition, the present disclosure is to provide a laundry treating apparatus and a method for controlling the laundry treating apparatus where dissolving of a detergent is easy.

[Technical Solutions]

[0010] Provided is a method for controlling a laundry treating apparatus including a tub that stores water therein, a drum rotatably disposed inside the tub to store an object-to-be-washed therein, a detergent storage that stores a detergent therein, a storage water supply pipe that supplies water to the detergent storage, a tub connecting pipe that guides water discharged from the detergent storage to the tub, a tub water supply pipe that supplies water to the tub, a drain hole defined to extend through the tub, and a drain pump connected to the drain hole.

[0011] The method may include supplying of water of supplying water to the tub via the tub water supply pipe, supplying of the detergent of supplying the detergent and water into the tub via the storage water supply pipe after the supplying of water is completed, and washing of removing foreign substances from the object-to-be-washed by rotating the drum after the supplying of the detergent is completed.

[0012] The supplying of water may proceed until reaching a first water level set to a water level lower than a lowest point of the drum.

[0013] The first water level may be set to a water level where the drain hole is submerged.

[0014] The laundry treating apparatus may further include a heater that is fixed to the tub to be positioned between the lowest point of the drum and the drain hole and heats water stored in the tub, and the first water level may be set to a water level where the heater is submerged.

[0015] The supplying of the detergent may proceed until reaching a second water level set to a water level higher than the lowest point of the drum.

[0016] The method may further include determining of a laundry amount of sensing an amount of the object-to-be-washed stored in the drum, wherein the determining of the laundry amount proceeds before initiating the supplying of the detergent, and the second water level may be set to increase in proportion to the amount of the object-to-be-washed stored in the drum.

[0017] The method may further include dissolving of dissolving the detergent inside the tub by rotating the drum, wherein the dissolving proceeds after the supply-

ing of the detergent is completed and before the washing is initiated.

[0018] Provided is a method for controlling a laundry treating apparatus including a tub that stores water therein, a drum rotatably disposed inside the tub to store an object-to-be-washed therein, a first chamber and a second chamber that form spaces separated from each other and provide spaces where a detergent is able to be stored, a first water supply pipe that supplies water to the first chamber, a second water supply pipe that supplies water to the second chamber, a tub connecting pipe that guides water discharged from the first chamber and the second chamber to the tub, a drain hole defined to extend through the tub, and a drain pump connected to the drain hole.

[0019] The method may include supplying of water of supplying water to the tub via a chamber with no detergent stored among the first chamber and the second chamber by controlling one of the first water supply pipe and the second water supply pipe, supplying of the detergent of supplying the detergent and water into the tub via a chamber with the detergent stored among the first chamber and the second chamber after the supplying of water is completed, and washing of removing foreign substances from the object-to-be-washed by rotating the drum after the supplying of the detergent is completed.

[0020] The supplying of water may proceed until reaching a first water level set to a water level lower than a lowest point of the drum.

[0021] The first water level may be set to a water level where the drain hole is submerged.

[0022] The supplying of the detergent may proceed until reaching a second water level set to a water level higher than a lowest point of the drum.

[0023] Provided is a method for controlling a laundry treating apparatus including a tub that stores water therein, a drum rotatably disposed inside the tub to store an object-to-be-washed therein, a detergent storage that stores a detergent therein, a storage water supply pipe that connects the detergent storage with a water supply source, a tub connecting pipe that guides water discharged from the detergent storage to the tub, a tub water supply pipe that connects the tub with the water supply source, a drain hole defined to extend through the tub, and a drain pump connected to the drain hole.

[0024] The method may include supplying of water of supplying water to the tub via the tub water supply pipe, supplying of the detergent of supplying the detergent and water into the tub via the storage water supply pipe after the supplying of water is completed, and washing of removing foreign substances from the object-to-be-washed by rotating the drum after the supplying of the detergent is completed.

[0025] The supplying of water may proceed until reaching a first water level set to a water level lower than a lowest point of the drum.

[0026] The supplying of the detergent may proceed until reaching a second water level set to a water level higher than a lowest point of the drum.

[Advantageous Effects]

[0027] The present disclosure provides the laundry treating apparatus and the method for controlling the laundry treating apparatus that may prevent the deterioration in the washing performance resulted from the lack of detergent.

[0028] In addition, the present disclosure provides the laundry treating apparatus and the method for controlling the laundry treating apparatus where the dissolving of the detergent is easy.

[Brief Description of the Drawings]

[0029]

FIG. 1 shows an example of a laundry treating apparatus.

FIG. 2 shows an example of a detergent storage and a water supply.

FIG. 3 shows an example of a detergent storage.

FIGS. 4 and 5 show an example of a method for controlling a laundry treating apparatus.

[Detailed Description]

[0030] Hereinafter, a preferred embodiment of a laundry treating apparatus and a method for controlling the laundry treating apparatus will be described in detail with reference to the accompanying drawings.

[0031] As shown in FIG. 1, a laundry treating apparatus 100 may include a cabinet 1, a tub 2 positioned inside the cabinet to provide a space for storing water, and a drum 7 rotatably disposed inside the tub and where an object-to-be-washed (laundry or the like) is stored.

[0032] The cabinet 1 may be disposed to form an outer appearance of the laundry treating apparatus 100. A laundry inlet 11 through which the laundry is inserted into and withdrawn from the cabinet 1 is defined in one surface of the cabinet 1. FIG. 1 shows a case in which the laundry inlet 11 is defined in a front surface of the cabinet as an example. The laundry inlet 11 may be opened or closed by a door 13 pivotably fixed to the cabinet 1.

[0033] A control panel 15 is disposed in a space of the front surface of the cabinet 1 above or below the laundry inlet 11.

[0034] The control panel 15 may include an input unit 151 and a display 153. The input unit 151 may be formed as means for inputting a control command to a controller (not shown), and the display 153 may be formed as means for displaying control commands selectable via the input unit and displaying execution information of the control command selected via the input unit.

[0035] The tub 2 may include a tub body 21 that provides the space for storing water and tub supports 22 and 23 that fix the tub body 21 inside the cabinet 1.

[0036] The tub body 21 may have a hollow cylindrical shape, and may have a tub inlet 211 in one surface thereof (a surface located on a side facing the laundry inlet).

[0037] The tub supports may include a damper 22 that connects a lower area of the tub body 21 (an area located below a horizontal line passing through a center of the tub inlet) to the cabinet 1, and a spring 23 that connects an upper area of the tub body 21 to the cabinet 1.

[0038] The laundry inlet 11 and the tub inlet 211 may be connected to each other via a gasket 24. The gasket 24 may be formed as a corrugated tube to not only guide the laundry supplied to the laundry inlet 11 to the tub inlet 211, but also minimize transmission of vibration of the tub body 21 to the cabinet 1.

[0039] A heater 25 may be disposed inside the tub body 21. The heater 25 may be means for heating water stored in the tub, and may be fixed to the tub body 21 and positioned between a bottom surface of the drum 7 and a bottom surface of the tub 2.

[0040] The tub body 21 receives water via a water supply 3, and water stored in the tub body 21 is drained to the outside of the cabinet 1 via a drainage 4.

[0041] The drainage 4 may include a first drain pipe 41 that connects a drain hole 213 defined to extend through the bottom surface of the tub body 21 with a drain pump 43, and a second drain pipe 42 that guides water drained from the drain pump 43 to the outside of the cabinet 1.

[0042] The drain hole 213 may be positioned at the lowest point of the tub body 21, and the heater 25 may be positioned between the bottom surface of the drum 7 and the drain hole 213.

[0043] An amount of water stored in the tub body 21 may be determined via a sensing unit 8. The sensing unit 8 may include a communication pipe 81 extending from the first drain pipe 41 toward a top surface of the cabinet 1 and a sensor 82 that senses a change in a pressure inside the communication pipe. It is preferable that a free end of the communication pipe 81 (one end of the communication pipe to which the sensor is fixed) is located at a point higher than the highest water level set in the tub body 21.

[0044] The drum 7 may include a drum body 71 located inside the tub body 21 to store the laundry therein, and a driver 74 that rotates the drum body 71.

[0045] The drum body 21 may have a hollow cylindrical shape, and may have a drum inlet 711 defined in one surface of the drum body (a surface on a side facing the tub inlet). Accordingly, when the door 13 opens the laundry inlet 11, a user may put the laundry into the drum body 71 via the laundry inlet 11, the tub inlet 211, and the drum inlet 711.

[0046] The drum body 21 has multiple communication holes 712. The communication holes 712 may be defined as multiple through-holes defined to extend through a circumferential surface of the drum body 21.

[0047] The drum body 21 may have a lifter 713. The lifter 713 is means for allowing the laundry to repeatedly ascend and descend inside the drum body 71 when the drum rotates, and is able to be formed as a board protruding from a circumferential surface of the drum body 21 toward a center of rotation of the drum body 21 .

[0048] The driver 74 may include a stator 741 fixed to a rear surface of the tub body 21 to form a rotating magnetic field, a rotor 742 rotated by the rotating magnetic field, and a rotation shaft 743 that extends through the tub body 21 to connect the drum body 71 with the rotor 742.

[0049] The laundry treating apparatus 100 may include a detergent storage 5. In this case, the water supply 3 may include a storage water supply pipe (a first connecting pipe) 31 that supplies water to the detergent storage 5, and a tub connecting pipe (a second connecting pipe) 32 that guides water and a detergent discharged from the detergent storage 5 to the tub body 21. The storage water supply pipe 31 may be disposed to connect a water supply source with the detergent storage 5, and opening and closing thereof may be controlled via a storage water supply pipe valve 34.

[0050] Furthermore, the water supply 3 may further include a tub water supply pipe 33 that supplies detergent-free water to the tub body 21 by directly connecting the water supply source with the tub body 21. Opening and closing of the tub water supply pipe 33 may be controlled via a tub water supply pipe valve (a third valve) 331.

[0051] The detergent storage 5 may include a housing 52 fixed inside the cabinet 1, a drawer 51 that may be extended to the outside of the cabinet 1 from the housing 52 to provide a space in which the detergent is stored, and a nozzle 54 that is fixed inside the cabinet 1 and supplies water to the drawer 51.

[0052] The housing 52 may have a housing outlet 53, and the tub connection pipe 32 may be formed as a flow channel that connects the housing outlet 53 (see FIG. 1) with the gasket 24. A guide 321 that guides water inside the tub connection pipe 32 in a direction where the drum inlet 711 is located may be disposed at one end of the tub connection pipe 32.

[0053] As shown in FIG. 2, the drawer 51 may have multiple spaces in which the detergent is stored. The drawing shows a case in which the drawer 51 includes a first chamber 511, a second chamber 512, and a third chamber 513 as an example.

[0054] The chamber may be separated from each other. The detergent inside the first chamber 511 may be discharged to the housing 52 via a first chamber outlet 514, the detergent in the second chamber 512 may be discharged to the housing 52 via a second chamber outlet 515, and the detergent in the third chamber 513 may be discharged to the housing 52 via a third chamber outlet 516. The drawing shows as an example a case in which the first chamber outlet 514 and the second chamber outlet 515 are defined as through-holes extending through the drawer 51 and the third chamber outlet 516 is formed as a siphon flow channel.

[0055] The nozzle 54 may include a nozzle body 541 having water flow channels 543, 544, and 545, and a

cover 542 fixed to the nozzle body 541 to seal the flow channels.

[0056] As shown in FIG. 3, the nozzle body 541 may include the first flow channel 543 that supplies water to the first chamber 511, the second flow channel 544 that supplies water to the second chamber 512, and the third flow channel 545 that supplies water to the third chamber 513.

[0057] The nozzle body 541 may have a first flow channel water inlet 543a that supplies water to the first flow channel 543 and a second flow channel water inlet 544a that supplies water to the second flow channel 544. When the first flow channel water inlet 543a and the second flow channel water inlet 544a spray water at the same time, the first flow channel water inlet 543a and the second flow channel water inlet 544a may be arranged in a V-shape such that water sprayed from the water inlets 543a and 544a may collide with each other.

[0058] The first flow channel 543 may be defined as a groove extending from the first flow channel water inlet 543a disposed on one surface of the nozzle body 541 toward a top surface of the first chamber 511, and the second flow channel 544 may be defined as a groove extending from the second flow channel water inlet 544a disposed on one surface of the nozzle body 541 toward a top surface of the second chamber 512.

[0059] When the first flow channel water inlet 543a and the second flow channel water inlet 544a are arranged in the V-shape, the first flow channel 543 and the second flow channel 544 may have one intersection. The third flow channel 545 may be defined as a groove extending from the intersection of the two flow channels 543 and 544 toward a top surface of the third chamber 513. In this case, a water inlet (a third flow channel water inlet) 545a of the third flow channel 545 will be formed at the intersection of the first flow channel 543 and the second flow channel 544.

[0060] Water inside the first flow channel 543 is supplied to the first chamber 511 via a first flow channel outlet 543b, and water inside the second flow channel 544 is supplied to the second chamber 512 via a second flow channel outlet 544b.

[0061] The first flow channel outlet 543b may extend through the nozzle body 541 to connect the first flow channel 543 with the first chamber 511, and the second flow channel outlet 544b may extend through the nozzle body 541 to connect the second flow channel 544 with the second chamber 512.

[0062] In one example, water in the third flow channel 545 is supplied to the third chamber 513 via a third flow channel outlet 545b. The third flow channel outlet 545b may extend through the nozzle body 541 to connect the third flow channel 545 with the third chamber 513.

[0063] When the first flow channel 543, the second flow channel 544, and the third flow channel 545 are formed as described above, the storage water supply pipe 31 may include a first water supply pipe 311 that connects the water supply source with the first flow channel water inlet 543a, and a second water supply pipe 312 that connects the water supply source and the second flow channel water inlet 544a.

[0064] In this case, the storage water supply pipe valve 34 may include a first valve 341 that controls opening and closing of the first water supply pipe 311 and a second valve 342 that controls opening and closing of the second water supply pipe 312.

[0065] When the first water supply pipe 311 is opened and the second water supply pipe 312 is closed, water will be supplied only to the first chamber 511 via the first flow channel 543. Conversely, when the first water supply pipe 311 is closed and the second water supply pipe 312 is opened, water will be supplied only to the second chamber 512 via the second flow channel 544. In one example, when the two water supply pipes 311 and 312 are simultaneously opened, water will be supplied only to the third chamber 513 via the third flow channel 545.

[0066] Water supplied to each of the chambers 511, 512, and 513 will flow to the housing 52 via each of the chamber outlets 514, 515, and 516 defined in each of the chambers, and water inside the housing 52 fill flow to the tub body 21 via the tub connecting pipe 32.

[0067] FIG. 4 shows an example of a method for controlling a laundry treating apparatus having the above-described structure.

[0068] The control method in FIG. 4 may include supplying water (s10) of supplying only water to the tub 2, supplying the detergent (S40) of supplying the detergent and water together to the tub 2 after the supplying of water is completed, and washing (S80) of removing foreign substances from the object-to-be-washed by rotating the drum 7 after the supplying of the detergent is completed.

[0069] The supplying of water (S10) is an operation of supplying water that does not contain the detergent to the tub 2, and is able to be performed as the controller (not shown) controls the tub water supply pipe valve 331 to open the tub water supply pipe 33.

[0070] In one example, the supplying of water (S10) may be an operation of supplying water to the tub 2 via a chamber in which no detergent is stored among the three chambers 511, 512, and 513 disposed in the detergent storage 5.

[0071] That is, the supplying of water (S10) may be an operation of controlling the first valve 341 and the second valve 342 such that water is supplied to the tub 2 via the chamber in which no detergent is stored among the first chamber 511, the second chamber 512, and the third chamber 513 disposed in the drawer 51.

[0072] For example, when the detergent is stored in the first chamber 511, in the supplying of water (S10), water may be supplied only to the second flow channel 544 as the second valve 342 is operated, or water may be supplied only to the third flow channel 545 as both the first valve 341 and the second valve 342 are operated.

[0073] When the detergent is stored in the second chamber 512, in the supplying of water (S10), water may

be supplied only to the first flow channel 543 as the first valve 341 is operated, or water may be supplied only to the third flow channel 545 as both the first valve 341 and the second valve 342 are operated.

[0074] Similarly, when the detergent is stored in the third chamber 513, in the supplying of water (S10), water may be supplied only to the first flow channel 543 as the first valve 341 is operated, or water may be supplied only to the second flow channel 544 as the second valve 342 is operated.

[0075] Which chamber stores the detergent and which chamber is empty may be determined by information input by the user via the input unit 151, or determined via the sensor that is disposed in the detergent storage 5 to sense whether the detergent is stored in each chamber 511, 512, and 513.

[0076] The supplying of water (S10) is performed until a water level inside the tub 2 reaches a predetermined first water level (S20).

[0077] The supplying of water (S10) is a process for minimizing the discharge of the detergent supplied via supplying the detergent (S40) to the first drain pipe 41 via the drain hole 213 (a process of forming a water barrier in the drain hole), so that it is preferable that the first water level is set to a water level that prevents the drain hole 213 from being exposed.

[0078] (a) in FIG. 5 shows a case in which the first water level is set to a water level L2 higher than the drain hole 213 and lower than the lowest point of the drum 7 as an example. When the heater 25 is disposed inside the tub body 21, the first water level may be set to a water level L1 at which the heater 25 is submerged. This is because, to promote dissolution of the detergent, operating the heater 25 to heat water may be initiated after the supplying of water (S10) is completed.

[0079] (a) in FIG. 5 shows the case in which the supplying of water (S10) is performed via the tub water supply pipe 33, but as described above, in the supplying of water (S10), water may be supplied to the tub via the empty chamber 511, 512, or 513 of the detergent storage 5.

[0080] Whether the water level inside the tub body 21 has reached the first water level (S20) is determined via the sensing unit 8. When the sensing unit 8 senses that the water level inside the tub body 21 has reached the first water level, the supplying of water is terminated (S30).

[0081] As shown in FIG. 4, the supplying of the detergent (S40) may be initiated when the supplying of water is terminated (S30).

[0082] The supplying of the detergent (S40) is an operation of supplying the detergent stored in the detergent storage 5 together with water to the tub body 21, and proceeds as opening and closing of the storage water supply pipes 311 and 312 are controlled.

[0083] That is, the supplying of the detergent (S40) may be an operation of controlling the first valve 341 and the second valve 342 such that water is supplied to a chamber in which the detergent is stored among the first chamber 511, the second chamber 512, and the third chamber 513 disposed in the drawer 51.

[0084] For example, the supplying of the detergent (S40) will be a process of supplying water only to the first flow channel 543 by operating the first valve 341 when the detergent is stored in the first chamber 511, will be a process of supplying water only to the second flow channel 544 by operating the second valve 342 when the detergent is stored in the second chamber 512, and will be a process of supplying water only to the third flow channel 545 by operating both the first valve 341 and the second valve 342 when the detergent is stored in the third chamber 513.

[0085] As shown in (b) in FIG. 5, the supplying of the detergent (S40) may proceed until reaching a second water level L3 set higher than the lowest point of the drum body 71 (S50). This is to allow water inside the tub body 21 to be supplied to the laundry inside the drum body 71.

[0086] The second water level may be determined based on an amount of the laundry (an amount of the object-to-be-washed) put into the drum body 71. In this case, as shown in FIG. 4, the control method may perform determining the laundry amount (s15) that is performed before initiating the supplying of the detergent (S43) and senses the amount of laundry stored in the drum 7.

[0087] The determining of the laundry amount (S15) may be performed in various ways. A method for determining the laundry amount based on an amount of current supplied to the stator 741 while rotating the drum 7 by a predetermined reference angle, or a method for determining the laundry amount by measuring a rotation angle of the drum after supplying a predetermined amount of power to the stator 741 will be an example. However, the second water level L2 is preferably set to increase in proportion to the amount of the object-to-be-washed stored in the drum 7.

[0088] When the water level of the tub body 21 reaches the second water level L3 (S50), the supplying of the detergent (S43) of supplying the detergent and water to the tub is terminated (S60).

[0089] The washing (S80) may be initiated when the supplying of the detergent (S40) is completed. The washing (S80) may be set to an operation of removing the foreign substances from the laundry by executing clockwise rotation and counterclockwise rotation of the drum 7 alternately by controlling the driver 74. Unlike as described above, in the washing (S80), a rotation direction of the drum may be set only to a clockwise direction or only to a counterclockwise direction.

[0090] To facilitate the removal of the foreign substances from the laundry, dissolving (S70) of dissolving the detergent in water may be further included before initiating the washing (S80). The dissolving (S70) may be an operation of rotating the drum 7 with the number of rotations smaller than the number of rotations set in the washing.

[0091] In the dissolving (S70), the drum may be set to perform the clockwise rotation and the counterclockwise

rotation alternately, or may be set to rotate only in one of the two directions. In addition, in the dissolving (S70), water may be heated as the heater 25 is operated together with the rotation of the drum.

[0092] The above-described control method may minimize, via the supplying of water (S10), the possibility that the detergent supplied in the supplying of the detergent (S40) is discharged to the first drain pipe 41 via the drain hole 213, and accordingly, prevent deterioration of a washing performance resulted from the lack of the detergent.

[0093] Because the above-described structure and control method of the laundry treating apparatus are related to the embodiment, the scope of rights of the present disclosure is not limited to the above-described embodiment.

Claims

1. A method for controlling a laundry treating apparatus including a tub configured to store water therein, a drum rotatably disposed inside the tub to store an object-to-be-washed therein, a detergent storage configured to store a detergent therein, a storage water supply pipe configured to supply water to the detergent storage, a tub connecting pipe configured to guide water discharged from the detergent storage to the tub, a tub water supply pipe configured to supply water to the tub, a drain hole defined to extend through the tub, and a drain pump connected to the drain hole, the method comprising:

   supplying of water of supplying water to the tub via the tub water supply pipe;
   supplying of the detergent of supplying the detergent and water into the tub via the storage water supply pipe after the supplying of water is completed; and
   washing of removing foreign substances from the object-to-be-washed by rotating the drum after the supplying of the detergent is completed.

2. The method of claim 1, wherein the supplying of water proceeds until reaching a first water level set to a water level lower than a lowest point of the drum.

3. The method of claim 2, wherein the first water level is set to a water level where the drain hole is submerged.

4. The method of claim 2, wherein the laundry treating apparatus further includes a heater fixed to the tub to be positioned between the lowest point of the drum and the drain hole and configured to heat water stored in the tub,
   wherein the first water level is set to a water level where the heater is submerged.

5. The method of any one of claims 1 to 4, wherein the supplying of the detergent proceeds until reaching a second water level set to a water level higher than the lowest point of the drum.

6. The method of claim 5, further comprising determining of a laundry amount of sensing an amount of the object-to-be-washed stored in the drum, wherein the determining of the laundry amount proceeds before initiating the supplying of the detergent,
   wherein the second water level is set to increase in proportion to the amount of the object-to-be-washed stored in the drum.

7. The method of claim 5, further comprising dissolving of dissolving the detergent inside the tub by rotating the drum, wherein the dissolving proceeds after the supplying of the detergent is completed and before the washing is initiated.

8. A method for controlling a laundry treating apparatus including a tub configured to store water therein, a drum rotatably disposed inside the tub to store an object-to-be-washed therein, a first chamber and a second chamber configured to form spaces separated from each other and provide spaces where a detergent is able to be stored, a first water supply pipe configured to supply water to the first chamber, a second water supply pipe configured to supply water to the second chamber, a tub connecting pipe configured to guide water discharged from the first chamber and the second chamber to the tub, a drain hole defined to extend through the tub, and a drain pump connected to the drain hole, the method comprising:

   supplying of water of supplying water to the tub via a chamber with no detergent stored among the first chamber and the second chamber by controlling one of the first water supply pipe and the second water supply pipe;
   supplying of the detergent of supplying the detergent and water into the tub via a chamber with the detergent stored among the first chamber and the second chamber after the supplying of water is completed; and
   washing of removing foreign substances from the object-to-be-washed by rotating the drum after the supplying of the detergent is completed.

9. The method of claim 8, wherein the supplying of water proceeds until reaching a first water level set to a water level lower than a lowest point of the drum.

10. The method of claim 8, wherein the first water level is set to a water level where the drain hole is submerged.

11. The method of claim 8, wherein the supplying of the detergent proceeds until reaching a second water level set to a water level higher than a lowest point of the drum.

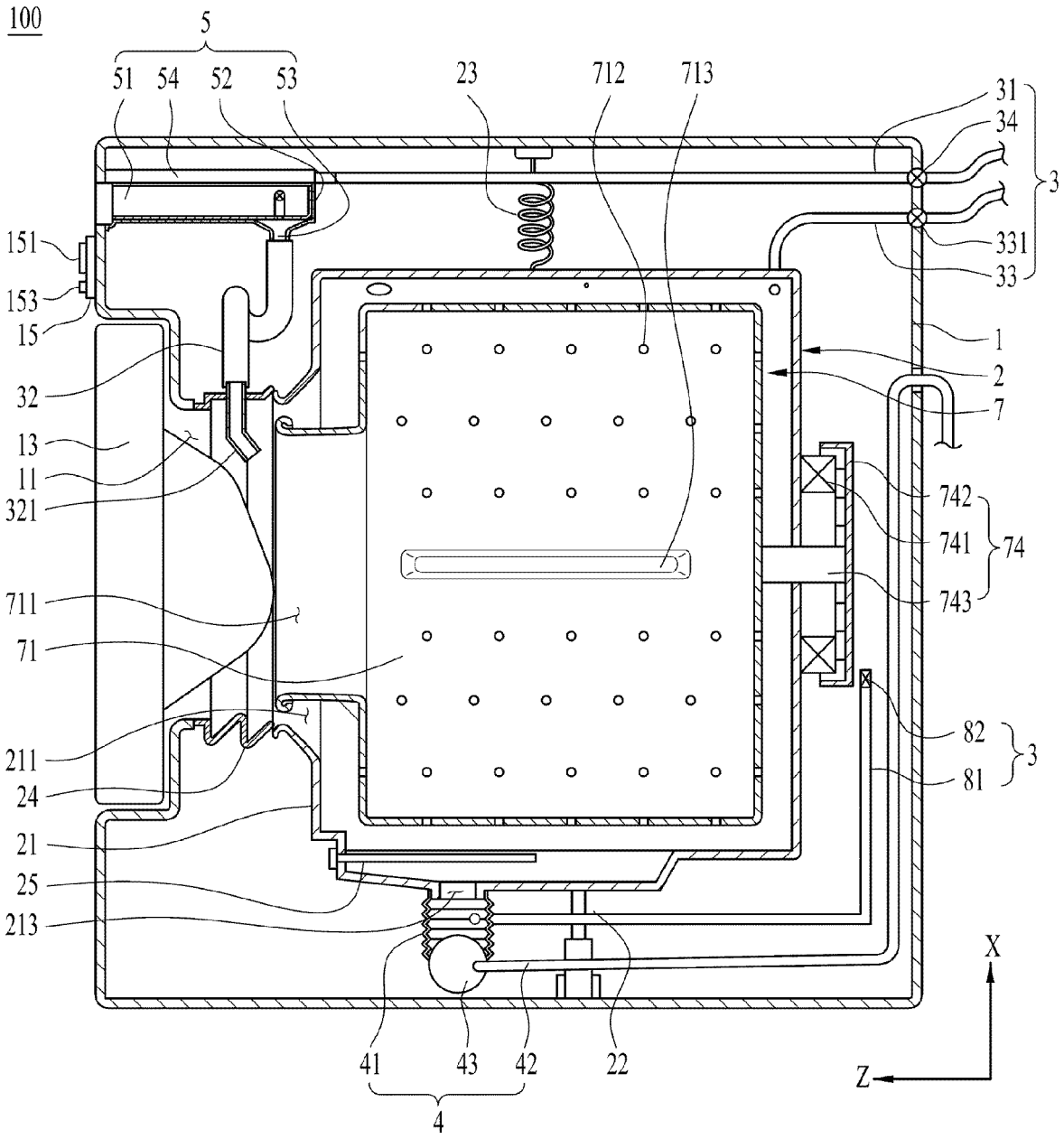
12. A method for controlling a laundry treating apparatus including a tub configured to store water therein, a drum rotatably disposed inside the tub to store an object-to-be-washed therein, a detergent storage configured to store a detergent therein, a storage water supply pipe configured to connect the detergent storage with a water supply source, a tub connecting pipe configured to guide water discharged from the detergent storage to the tub, a tub water supply pipe configured to connect the tub with the water supply source, a drain hole defined to extend through the tub, and a drain pump connected to the drain hole, the method comprising:

supplying of water of supplying water to the tub via the tub water supply pipe;
supplying of the detergent of supplying the detergent and water into the tub via the storage water supply pipe after the supplying of water is completed; and
washing of removing foreign substances from the object-to-be-washed by rotating the drum after the supplying of the detergent is completed.

13. The method of claim 12, wherein the supplying of water proceeds until reaching a first water level set to a water level lower than a lowest point of the drum.

14. The method of claim 12, wherein the supplying of the detergent proceeds until reaching a second water level set to a water level higher than a lowest point of the drum.

[FIG. 1]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53
23
712
713
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3
331
33
151
153
15
32
13
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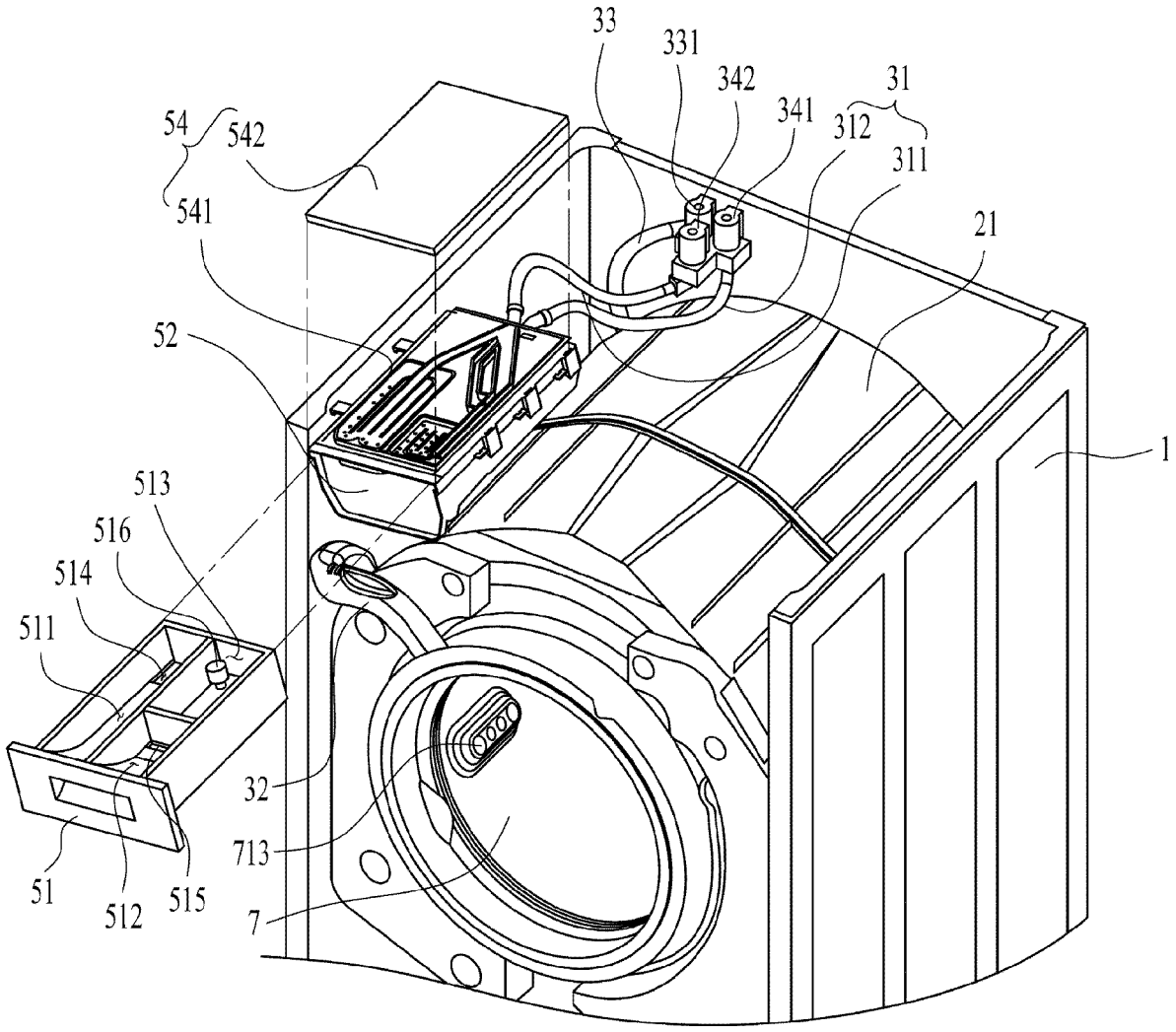
321
711
71
211
24
21
25
213
1
2
7
742
741
74
743
82
81
3
41
43
42
22
4
X
Z

[FIG. 2]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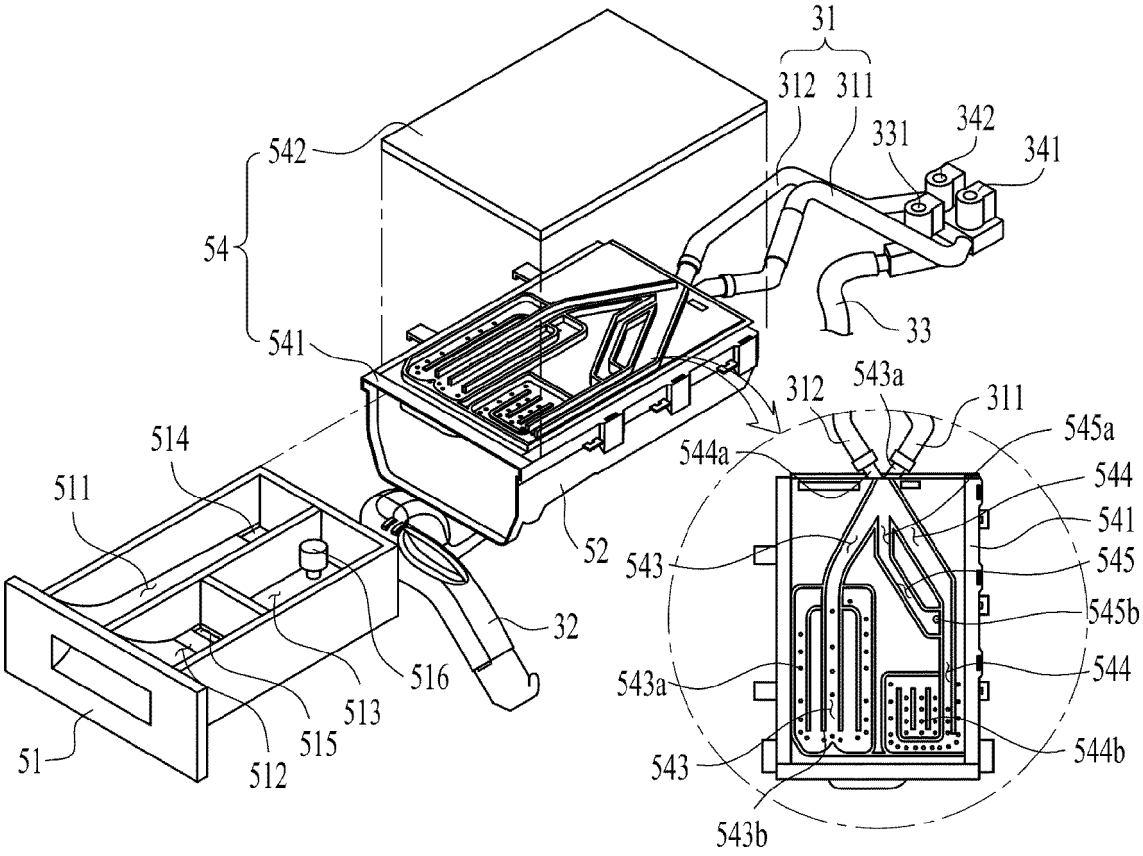
32
713
7
51
512
515

[FIG. 3]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33
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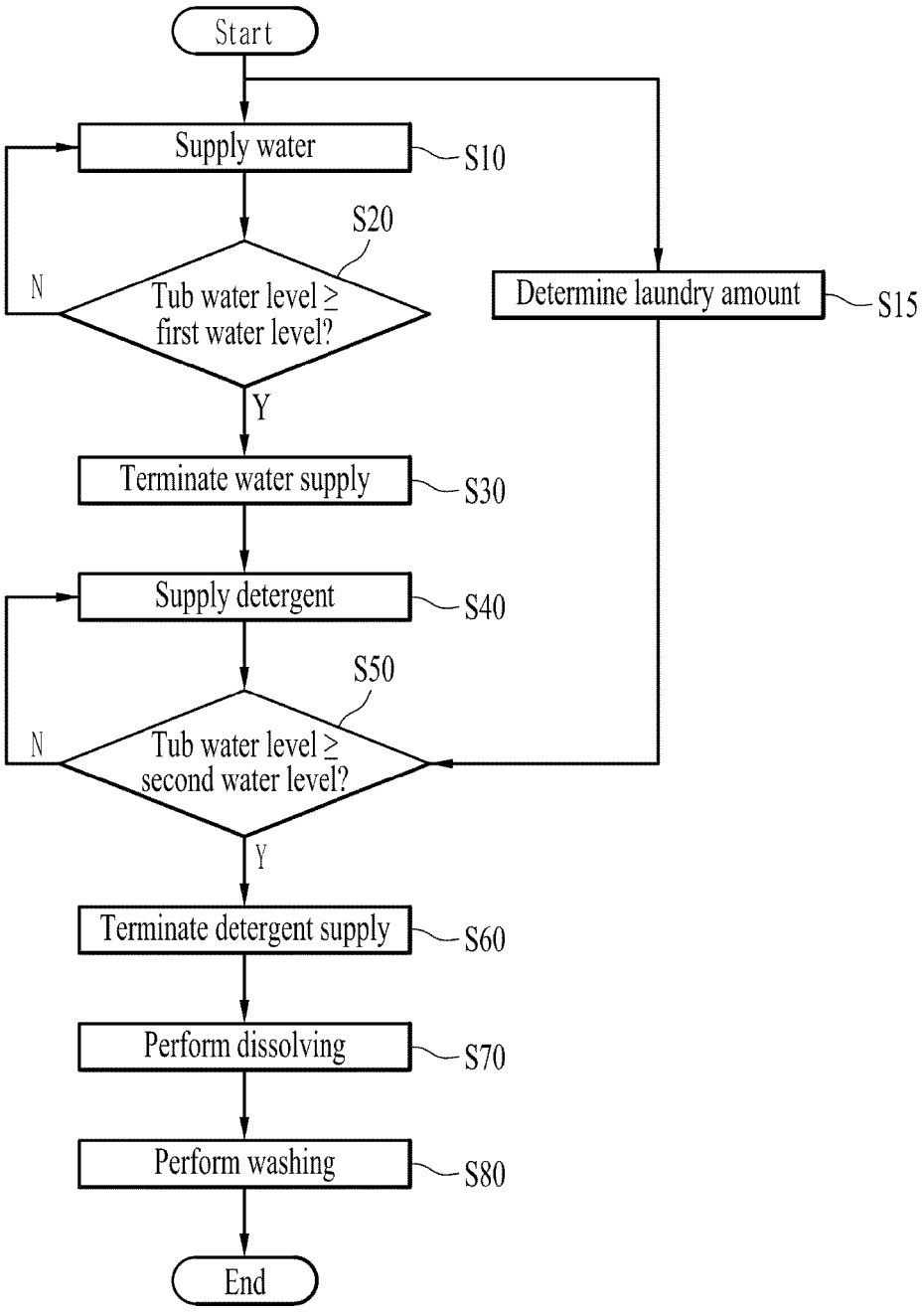
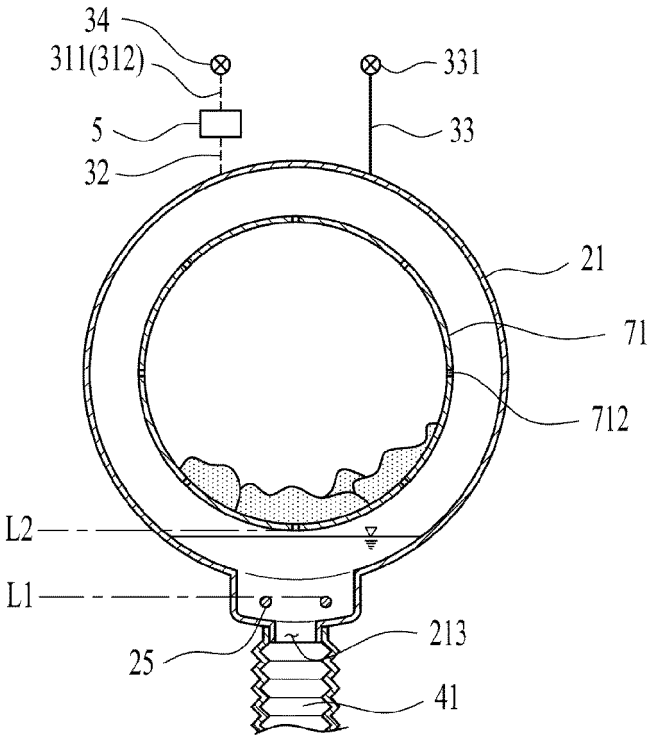
311
545a
544a
544
541
543
545
545b
544
543a
544b
543
543b
514
511
52
32
516
513
515
512
51

[FIG. 4]


Start
Supply water
S10
S20
Tub water level ≥ first water level?
N
Y
Determine laundry amount
S15
Terminate water supply
S30
Supply detergent
S40
S50
Tub water level ≥ second water level?
N
Y
Terminate detergent supply
S60
Perform dissolving
S70
Perform washing
S80
End

[FIG. 5]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5
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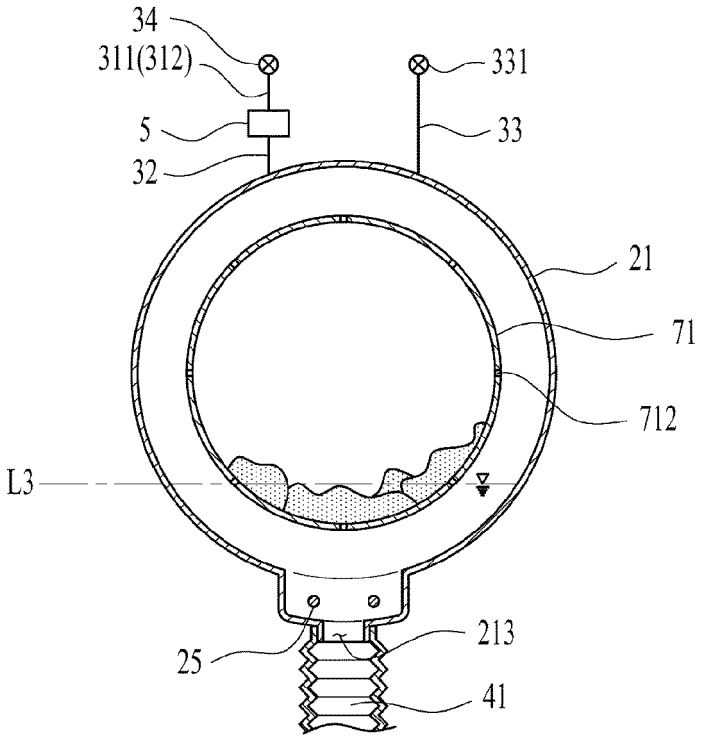
32
21
71
712
L2
L1
25
213
41

(a)


34
311(312)
331
5
33
32
21
71
712
L3
25
213
41

(b)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2022/015275

A. CLASSIFICATION OF SUBJECT MATTER

D06F 39/02(2006.01)i; **D06F 39/08**(2006.01)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 39/02(2006.01); D06F 17/12(2006.01); D06F 33/02(2006.01); D06F 33/30(2020.01); D06F 39/08(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: 의류처리장치(clothes treating apparatus), 드럼(drum), 세제(detergent), 배수(drainage), 급수(water supply)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-1222569 B1 (SAMSUNG ELECTRONICS CO., LTD.) 16 January 2013 (2013-01-16) See paragraphs [0031]-[0033], [0037]-[0041], [0046], [0070], [0073]-[0074], [0084], [0100] and [0106], claim 1 and figures 1-2 and 4a-5.	1-4,12-13
Y		5-11,14
Y	KR 10-2019-0083870 A (LG ELECTRONICS INC.) 15 July 2019 (2019-07-15) See paragraphs [0041]-[0043], [0073]-[0074], [0076] and [0082] and figures 1, 3, 9 and 11.	5-11,14
Y	KR 10-1041081 B1 (SAMSUNG ELECTRONICS CO., LTD.) 13 June 2011 (2011-06-13) See claim 1 and figure 3.	6
A	KR 10-0249690 B1 (LG ELECTRONICS INC.) 15 March 2000 (2000-03-15) See claims 1-3 and figures 2-3.	1-14

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

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"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
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"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
30 January 2023	**31 January 2023**
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.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2022/015275

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2012-170690 A (PANASONIC CORP.) 10 September 2012 (2012-09-10) See claims 1-3 and figures 1-4.	1-14
PX	KR 10-2022-0056145 A (LG ELECTRONICS INC.) 04 May 2022 (2022-05-04) See claims 1-14 and figures 1-5. (* This document is a published earlier application that serves as a basis for claiming priority of the present international application.)	1-14

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2022/015275

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JP 2012-170690 A	10 September 2012	CN 103069068 A	24 April 2013
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		EP 2615203 A1	17 July 2013
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		EP 2653601 A4	10 September 2014
		EP 2653601 B1	17 February 2016
		JP 5799199 B2	21 October 2015
		SI 2653601 T1	30 June 2016
		WO 2012-114722 A1	30 August 2012
KR 10-2022-0056145 A	04 May 2022	None	

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