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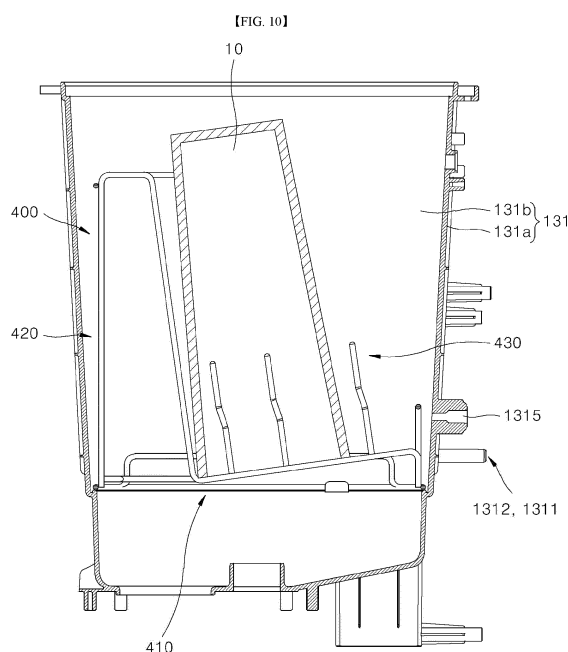
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(54) **CUP WASHER**

(57) A cup washer according to an embodiment may include a washing unit for washing cups accommodated therein. The cup washer may include: a tub that provides a space for accommodating the cups; and a rack which is provided inside the tub and on which the cups are placed. The rack may include: a bottom part that supports the cups on the rack from below; a side part that is formed protruding on one side of the tub and supports the cups from one side; and a tine that protrudes from the bottom part toward the upper side of the tub.



Description

[Technical Field]

[0001] The present invention relates to a cup washer, and more particularly, to a cup washer for washing a cup carried by a user.

[Background Art]

[0002] The matters described in this section merely provide background information on the present invention and do not constitute prior art.

[0003] Recently, in order to prevent environmental pollution, stores selling beverages are reducing the number of disposable cups provided to customers, and there is an increasing trend that when customers visit the stores, they carry their own reusable cups such as tumblers, and put beverage in their reusable cups.

[0004] In order to provide convenience to customers, that is, those who carry and use their own reusable cups, it is necessary to place a cup washer for washing reusable cups carried by users in the store, so that users can conveniently wash their reusable cups carried by them.

[0005] Therefore, by equipping a store with a cup washer capable of washing the reusable cups carried by users, they can wash their own reusable cups conveniently by themselves. Such a cup washer needs to have a structure enabling everyone to use it with easy.

[0006] The cup washer may be provided with a rack in a washing part, on which a cup can be rested. Related prior art is disclosed in Korean Patent Application Publication No. 10-2012-0107225 and Korean Patent Application Publication No. 10-2014-0064119.

[0007] The rack provided in the washing part needs to have a structure on which washing objects, that is, a cup and others, for example, a lid of the cup, a reusable straw and the like, can be stably rested.

[0008] Meanwhile, during the washing process, detergent for washing the cup and rinse for rinsing the cup may be injected into the washing part, so the washing part needs to be provided with a structure that helps the detergent and rinse to be well mixed with the water injected into the washing part. If such a structure can be provided on the rack, the washing efficiency can be improved.

[0009] Additionally, air may be sprayed onto the cup, lid, straw, and the like to dry any remaining water after a washing process with water. There is a need to develop a means to improve drying efficiency by providing a structure in which air can flow smoothly toward a rack on which the cups and the like are rested.

[Disclosure]

[Technical Problem]

[0010] An object of the present invention is to provide a

cup washer including a rack having a structure on which washing objects such as a cup, a cup lid, a reusable straw and the like can be stably rested.

[0011] It is also an object of the present invention to provide a cup washer including a rack having a structure that facilitate the smooth mixing of detergent or rinse with water.

[0012] It is also an object of the present invention to provide a cup washer including a washing part having a structure that facilitates the air for drying to flow smoothly toward the cup or the like rested on the rack.

[0013] The objects of the present invention are not limited to the ones described above, and other objects and advantages of the present invention which are not mentioned can be understood from the following description, and will be more clearly understood from the embodiments of the present invention. Furthermore, it will be readily appreciated that the objects and advantages of the present invention can be realized by the means presented in the claims, and combinations thereof.

[Technical Solution]

[0014] An example of the washing part may include a rack provided inside the tub, allowing a cup to be placed thereon, and formed by coupling a plurality of wires with each other.

[0015] The rack may include a bottom portion placed in the tub, and supporting from below a cup placed on the rack, and a side portion formed to protrude in one side of the tub, and supporting from one side the cup rested on the rack.

[0016] The bottom portion may include a first slope portion disposed with its longitudinal direction being inclined with respect to a lateral direction of the tub, and the side portion may include a second slope portion connected to the first slope portion and, and disposed with its longitudinal direction being inclined with respect to an up and down direction of the tub. The cup, which is a washing object, may be supported by the first slope portion at its lower side, and supported by the second slope portion surface at its side.

[0017] The rack may include a tine protruding from the bottom portion in an upward direction of the tub, at least a portion of which, when placing the cup on the rack, may be disposed inside the cup. The tine may include a second section disposed with its longitudinal direction being inclined with respect to the longitudinal direction of another section. As a result, when viewed in the longitudinal direction, the cross-sectional area of the tine can be increased.

[0018] The rack may include a first flow path guide part disposed to face the washing water inlet so that water introduced from the washing water inlet can be directed toward detergent introduced through the detergent inlet. The first flow path guide part can change the flow direction of the washing water toward where the detergent exists, thereby facilitating the smooth mixing of the de-

tergent and the water with each other.

[0019] The tub may include a guide cone connected with the air inlet hole, and guiding a flow of warm air introduced into the tub. The cross-sectional area of the flow path formed in the guide cone may decrease as it goes in the outlet direction of the guide cone.

[0020] The tub may include the auxiliary outlet discharging water to the outside of the tub to control the water level inside the tub. The rack may include a second flow path guide part disposed at a location corresponding to the auxiliary outlet, and guiding the flow path of water introduced to the inside of the tub from the auxiliary outlet. The water flowing back into the tub through the auxiliary outlet can be blocked by the second flow path guide part so as not to come into contact with the washing objects such as cup and the like rested on the rack.

[0021] A cup washer according to an embodiment may include a washing part washing a cup accommodated therein.

[0022] The washing part may include a tub providing a space to accommodate a cup, and a rack provided inside the tub and allowing a cup to be rested thereon.

[0023] The rack may include a bottom portion supporting from below a cup placed on the rack, a side portion formed to protrude in one side of the tub, and supporting a cup from one side, and a tine protruding from the bottom portion in an upward direction of the tub.

[0024] The bottom portion may include an edge portion forming an edge of the bottom portion, and formed so that a portion thereof protrudes in an upward direction of the tub, a first slope portion disposed with its longitudinal direction being inclined with respect to a lateral direction of the tub, and a first bend portion bent from the first slope portion, and coupled to the edge portion.

[0025] The side portion may include a vertical portion having one end coupled to the edge portion, and disposed with its longitudinal direction in an up and down direction of the tub, a second bend portion bent from the vertical portion, and a second slope portion extending from one end of the second bend portion, and disposed with its longitudinal direction being inclined with respect to an up and down direction of the tub.

[0026] The tine may include a first section protruding from the bottom portion, a second section extending from the first section, and disposed with its longitudinal direction being inclined with respect to the longitudinal direction of the first section, and a third section extending from the second section, and disposed with its longitudinal direction being inclined with respect to the longitudinal direction of the second section.

[0027] The first section and the third section may be disposed so that their longitudinal directions are parallel to each other.

[0028] The tub may include a detergent inlet introducing detergent, and a washing water inlet disposed in an upper side of the detergent inlet, and introducing water into the tub, and the rack may include a first flow path guide part coupled with the bottom portion, and disposed

to face the washing water inlet and guide a flow direction of water.

[0029] The first flow path guide part may include a base part coupled with the bottom portion, and a first pad coupled to the base part, disposed at a location corresponding to the washing water inlet to change a flow direction of water introduced into the tub, and formed in a curved shape when viewed in a cross section to guide water to flow in a downward direction of the tub.

[0030] The tub may include a rinse inlet disposed to be spaced apart from the detergent inlet, and introducing rinse, and the first flow path guide part can direct water introduced through the washing water inlet toward rinse introduced through the rinse inlet.

[0031] The tub may include an air inlet hole introducing air for drying, and a guide cone connected with the air inlet hole, and guiding a flow of warm air introduced into the tub.

[0032] The guide cone may be provided with a flow path formed therein, through which air flows, and whose cross-sectional area decreases as it goes in the outlet direction of the guide cone.

[0033] The guide cone may be provided to be directed upward as it goes in the outlet direction.

[0034] The guide cone may be provided so that the outlet is disposed in the lower side of the first slope portion.

[0035] The tube may include an auxiliary outlet disposed at a height corresponding to a height of the bottom portion, and discharging water to the outside of the tub, and the rack may include a second flow path guide part disposed at a location corresponding to the auxiliary outlet, and guiding the flow path of water introduced to the inside of the tub from the auxiliary outlet.

[0036] The second flow path guide part may include a second pad guiding water introduced from the auxiliary outlet to flow in a downward direction of the tub, a third pad bent from the second pad, and suppressing water introduced from the auxiliary outlet from flowing in an upward direction of the tub, and a fitting hole formed to penetrate through the third pad.

[0037] The tub may include an outer panel and an inner panel disposed inside the outer panel, and the detergent inlet, the rinse inlet, and the washing water inlet may be formed to penetrate through the outer panel and the inner panel.

[Advantageous Effects]

[0038] In the cup washer according to the present invention, the cup rested on the rack can be supported at its lower side by the first slope portion of the bottom portion, and supported at the side by the second slope portion of the side portion. Accordingly, the cup can be rested generally obliquely on the rack, so that not only the lower side of the cup but also the side portion of the cup can be supported by the rack. Therefore, the rack according to the embodiment can allow the cup to be more stably

rested thereon when compared to a structure in which the cup is supported only at the lower side.

[0039] In the cup washer according to the present invention, the tine may include the second section provided to be inclined with respect to another section. Accordingly, the straw can be tightly resed on the tine while at the same time the length of the tine can be effectively reduced, so that the straw can remain stably rested on the rack even under an external impact such as a sprayed water.

[0040] In the cup washer according to the present invention, the rack may be provided with the first flow path guide part that guides the flow direction of water to a location adjacent to the washing water inlet of the tub. Thus, the water introduced into the tub can flow toward the detergent or rinse by the first flow guide part. As a result, the flowing water can be mixed with the detergent or rinse, so the water and the detergent or rinse can be smoothly mixed with each other, improving the washing efficiency of the cup washer.

[0041] Additionally, In the cup washer according to the present invention, the guide cone can be provided to allow the air for drying to flow therethrough and be introduced to the inside of the tub, and the guide cone can guide the flow of air introduced into the tub so that the air can be directed from the outlet directly to the washing objects such as a cup and the like. Due to such a structure, by using the guide cone to spray air directly onto the cup or the like, the drying efficiency of the cup washer can be significantly improved compared to the case where the warm air is evenly sprayed to the entire washing part.

[0042] Additionally, In the cup washer according to the present invention, the second flow path guide part can be disposed to directly face the auxiliary outlet, and change the flow direction of the water flowing back through the auxiliary outlet to the tub to be directed to the lower side of the tub, thereby suppressing the contaminated water flowing back from spilling onto the cup or the like rested on the rack and contaminating the cup.

[0043] In addition to the effects described above, specific effects of the present invention will be described below together with specific details for practicing the invention.

[Description of Drawings]

[0044]

FIG. 1 is a perspective view showing a cup washer according to an embodiment.

FIG.2 is a view of FIG. 1 when viewed from a different direction.

FIG. 3 is a view showing a state in which a door is opened in a cup washer according to an embodiment.

FIG.4 is a perspective view showing a cup washer with some components removed.

FIG.5 is a side view of FIG.4.

FIG.6 is a perspective view showing the washing part according to an embodiment.

FIG.7 is a front view showing the washing part according to an embodiment.

FIG.8 is a side view showing the washing part according to an embodiment.

FIG.9 is a rear view showing the washing part according to an embodiment.

FIG. 10 is a cross-sectional view showing a tub and rack according to an embodiment.

FIG. 11 is a perspective view showing a rack according to an embodiment.

FIG. 12 is a side view showing a rack according to an embodiment.

FIG. 13 is an enlarged view of a portion of the rack illustrated in FIG.12.

FIG. 14 is a perspective view showing a rack additionally including a first flow path guide part according to an embodiment.

FIG. 15 is an enlarged side view of a portion of the rack shown in FIG. 14.

FIG. 16 is a perspective view showing a rack additionally including an air inlet hole according to an embodiment.

FIG. 17 is a view showing a rack at a region where an air inlet hole is disposed.

FIG.18 is a view showing an auxiliary outlet and a second flow path guide part according to an embodiment.

[Best Mode]

[0045] The purposes, features and advantages described above will be described in detail below with reference to the accompanying drawings, so that a person having ordinary knowledge in the technical field to which the present invention pertains can easily practice the technical idea of the present invention. In describing the present invention, if it is determined that a detailed description of a known technology related to the present invention may unnecessarily obscure the gist of the present invention, the detailed description thereof will be omitted. Hereinafter, preferred embodiments of the present invention will be described in detail with reference to the accompanying drawings. In the drawings, like reference numerals are used to refer to like or similar components.

[0046] Although the terms "first", "second", and so on are used to describe various components, these components are not limited by these terms. These terms are merely used to distinguish one component from another component, and unless specifically stated to the contrary, it should be understood that a first component may also be a second component.

[0047] Throughout the specification, unless specifically stated to the contrary, each component may be singular or plural.

[0048] As used herein, singular expressions include

plural expressions, unless the context clearly dictates otherwise. In this application, the terms "be comprised of" or "comprising" should not be construed to necessarily include all of the various components or various steps described in the specification, but should be construed to mean that some of the components or some of the steps may not be included, or that additional components or steps may be included.

[0049] Throughout the specification, "A and/or B" means A, B, or A and B, unless otherwise specified, and "C to D" means equal to or greater than C and equal to or smaller than D unless otherwise specified.

[0050] Throughout the specification, the term "up and down direction" refers to the up and down direction of the cup washer when installed for normal use. The term "left and right direction" refers to a direction perpendicular to the up and down direction, and the term "front and rear direction" refers to a direction orthogonal to both the up and down direction and the left and right direction. The term "opposite-side direction" or "lateral direction" has a meaning including the left and right direction and the front and back direction.

[0051] FIG. 1 is a perspective view showing a cup washer according to an embodiment. FIG.2 is a view of FIG.1 when viewed from a different direction.

[0052] A cup washer according to an embodiment may be installed in a store that serves beverages, for example. Users of the cup washer may be customers who purchase and drink beverages. To protect the environment, the provision of disposable cups to customers in service stores has recently been restricted, and the scope of these restrictions is gradually expanding.

[0053] Accordingly, the cup washer may be installed in a service store so that users carrying reusable cups can wash and use the cups at the service store. These reusable cups such as tumblers carried by users may become objects to be washed. Therefore, the cup washer can have a structure that is convenient for the user to use.

[0054] At the upper side of the cup washer there may be provided a washing part 130 which accommodates therein and washes a cup. The washing part 130 may be opened and closed by a door 150. At this time, the door 150 may open and close the washing part 130 by being hinge-rotated in an up and down direction of the cup washer.

[0055] Due to such structure, the user can conveniently wash the cup by opening the door 150 with his/her hand, placing the cup in the washing part 130, closing the door 150 back, and then operating the cup washer without bending his/her waist.

[0056] In order for the user to use the cup washer without bending the waist, the height of the washing part 130 in the cup washer needs to be appropriately adjusted to fit the body of an adult. Additionally, in order to increase space efficiency, the cup washer needs to be provided to have a relatively small volume.

[0057] To this end, the cup washer may have a tower-like shape with a relatively small planar cross-sectional

area and a relatively great length in an up and down direction. Due to its tower-like shape, relatively bulky components of the cup washer need to be disposed in an up and down direction.

[0058] In addition, the cup washer may have a risk of toppling over because of the tower-like shape, and thus, it is necessary to lower the overall center of gravity by placing components with relatively greater weights at the lower side in order to prevent the cup washer from toppling over.

[0059] Hereinafter, the structure of the cup washer will be described in more detail with reference to the drawings. FIG. 3 is a view showing a state in which a door 150 is opened in a cup washer according to an embodiment. FIG.4 is a perspective view showing a cup washer with some components removed. FIG.5 is a side view of FIG.4.

[0060] The cup washer according to an embodiment may include a base plate 110, a water tank 120, a washing part 130, an intermediate plate 140, a door 150, and a frame 160.

[0061] The base plate 110 may be disposed at the lowermost side of the cup washer and may support other components of the cup washer. The lower part of the base plate 110 may be placed on the ground. The base plate 110 may include a first part 111 and a second part 112. The first part 111 may be placed on the ground at its lower surface, and may support the second part 112.

[0062] On the upper side of the first part 111 there may be placed the second part 112 on which the water tank 120 may be placed. To the second part 112 a frame 160 may be coupled. For example, to the second part 112 a front supporter 161, a rear supporter 162, and an intermediate supporter 163 may be coupled. As a result, the frame 160 may be supported by the second part 112.

[0063] The water tank 120 may be placed on the upper side of the base plate 110, and store water for washing a cup. The water tank 120 may be connected to the city water supply via a tubing. Accordingly, water from the city water can flow into the water tank 120 and be stored therein. Additionally, the water tank 120 may be connected to the washing part 130 via a tubing. Accordingly, water from the water tank 120 can be introduced into the washing part 130, and be used to wash a cup accommodated in the washing part 130.

[0064] In the water tank 120 there may be provided a heating device. The water in the water tank 120 may be heated by the heating device and introduced into the washing part 130. Accordingly, the cleaning efficiency for the cup can be improved because the cup is washed using the heated hot water.

[0065] The water tank 120 may be filled with water. Therefore, the water tank 120 filled with water can have a relatively greater weight compared to other components. The water tank 120 may be placed on the base plate 110 to be disposed at the lower side of the cup washer.

[0066] The height of the overall center of gravity of the cup washer can be lowered because of the weight of the

water tank 120 filled with water and disposed at the lower side of the cup washer. Accordingly, the cup washer provided in a tower-like shape with a relatively great length in an up and down direction can maintain a stable state without easily toppling over even under an external impact.

[0067] The washing part 130 may be disposed on the upper side of the water tank 120, and wash the cup accommodated therein. In the washing part 130 there may be formed a space for accommodating a cup. The washing part 130 may be connected to the water tank 120 via a tubing. Therefore, water for washing can be introduced from the water tank 120 into the washing part 130.

[0068] In another embodiment, the washing part 130 may be directly connected with the city water without passing through the water tank 120. Accordingly, the cup can be washed using water introduced from the water tank 120 or using water introduced directly from the city water, depending on the user's choice.

[0069] The intermediate plate 140 may be disposed between the water tank 120 and the washing part 130, and support the washing part 130. On the intermediate plate 140 the washing part 130 may be disposed, and the intermediate plate 140 may support a portion of the weight of the washing part 130. The intermediate plate 140 may have a generally plate-like shape, and be coupled to the frame 160 at the edges to be supported by the frame 160.

[0070] The door 150 may be disposed on the upper side of the washing part 130, and open and close the open top of the washing part 130 by being hinge-rotated in an up and down direction. Referring to FIG. 3, the door 150 may be hinge-rotated in the up and down direction of the cup washer. Therefore, the user can manually open the door 150, put a cup 10 inside the washing part 130, close the door 150 back, and then cause the washing process to be performed on the cup 10.

[0071] At the upper end of the washing part 130 a top cover 210 may be provided. A portion of the top cover 210 may be coupled to the upper perimeter region of the washing part 130, and the door 150 may be placed on top of it.

[0072] At another portion of the top cover 210 a feeding entrance cover 213 may be provided. The feeding entrance cover 213 may open and close the inlets for detergent and rinse introduced into the washing part 130, and be provided so as to be detachable from the top cover 210.

[0073] The user may open and close the door 150 at the upper end of the dishwasher to put a cup in the washing part 130 or take a cup out of the washing part 130. At this time, since the door 150 is hinge-rotated in an up and down direction, the user can conveniently move the door 150 without having to bend his/her waist.

[0074] In addition, since the door 150 is hinge-rotated, the cup washer can be provided such that the area it occupies when viewed in a plan view remains unchanged even when the door 150 is opened. Accordingly, the

planar cross-sectional area of the cup washer is constant regardless of whether the door 150 is opened or closed, so that no additional space is required to open the door 150.

[0075] In the embodiment, the cup is provided so as to be hinge-rotated in an up and down direction at the upper end of the washing part 130, so that the user can conveniently use the cup washer by opening and closing the door 150 without bending the waist. In addition, this structure eliminates the need for additional space to open the door 150, thereby increasing space efficiency.

[0076] The frame 160 may be supported by the base plate 110, be coupled with the intermediate plate 140, and support the washing part 130. The frame 160 may prepare an internal space in the cup washer, and various components may be coupled to it, and it may support these components.

[0077] The frame 160 may include the front supporter 161, the rear supporter 162, the intermediate supporter 163, and the upper supporter 164. Each component of the frame 160 may support the weights of the washing part 130, the door 150, and the like provided on the upper side of the cup washer.

[0078] The front supporters 161 may be disposed as a pair spaced apart from each other at the front of the cup washer, with their lower portions connected to the base plate 110, and with their longitudinal directions disposed in an up-down direction. The pair of front supporters 161 may be disposed at positions spaced apart from each other in the lateral direction of the cup washer at the front of the cup washer, and form front corner regions of the cup washer.

[0079] The front supporter 161 may be formed to have an L-shaped cross-section in order to form the corner region of the cup washer. The front supporter 161 may be coupled to the base plate 110 by a coupling mechanism such as a screw.

[0080] The rear supporters 162 may be disposed as a pair spaced apart from each other at the rear of the cup washer, with their lower portions connected to the base plate 110, and with their longitudinal directions disposed in an up-down direction. The pair of rear supporters 162 may be disposed at positions spaced apart from each other in the lateral direction of the cup washer at the rear of the cup washer, and be disposed adjacent to rear corner regions of the cup washer. The rear supporter 162 may be coupled to the base plate 110 by a coupling mechanism.

[0081] The intermediate supporters 163 may be disposed as a pair spaced apart from each other between the front supporters 161 and the rear supporters 162, with their lower portions connected to the base plate 110, and with their longitudinal directions disposed in an up-down direction. The pair of intermediate supporters 163 may be disposed at positions spaced apart from each other in the lateral direction of the cup washer in the central region of the cup washer.

[0082] The intermediate supporter 163 may be

coupled to the base plate 110 by a coupling mechanism. In addition, the intermediate supporter 163 may be coupled to the intermediate plate 140 and the upper supporter 164 by coupling mechanisms to stably maintain its own position and support the weights of the cup washer components.

[0083] The upper supporters 164 may be disposed as a pair spaced apart from each other in the lateral direction at the upper side of the intermediate supporter 163, with their longitudinal directions disposed in a front and rear direction, and be coupled with the washing part 130. The pair of upper supporters 164 may be disposed at positions spaced apart from each other in the lateral direction of the cup washer at the upper side of the cup washer.

[0084] The washing part 130 may be coupled to the upper supporter 164 by a coupling mechanism. Therefore, the upper supporter 164 can support the weight of the washing part 130.

[0085] The upper supporter 164 may be provided in a plural number so that they are spaced apart from each other in the up and down direction of the cup washer. Thus, in FIG. 5 and the like, an embodiment is illustrated in which each pair is provided on each of the opposite sides of the cup washer in an up and down direction of the cup washer, making a total of four. However, the number of upper supporters 164 is not limited to this.

[0086] Each upper supporter 164 may be coupled to the front supporter 161, the rear supporter 162, and the intermediate supporter 163. Accordingly, the weight of the washing part 130 can be transferred to the front supporter 161, the rear supporter 162, and the intermediate supporter 163 through the upper supporter 164, and finally to the base plate 110.

[0087] With this structure, the cup washer can stably support the washing part 130 provided therein. The upper supporter 164 may be coupled to the front supporter 161, the rear supporter 162, and the intermediate supporter 163 by a coupling mechanism such as a screw.

[0088] In the embodiment, the components provided in the upper side of the cup washer, including the washing part 130, may be supported by the frame 160, and each component may be finally supported by the base plate 110. Due to this structure, each component can be stably supported by the frame 160 and base plate 110, even with relatively heavy components such as the washing part 130 provided in the upper side of the cup washer.

[0089] The cup washer may include a front panel 170 and a rear panel 180. The front panel 170 may be disposed at the front of the cup washer to cover the water tank 120 and the washing part 130. The front panel 170 may be coupled to the rear supporter 162 of the frame 160 by a coupling mechanism.

[0090] The rear panel 180 may be coupled with the frame 160 to cover the rear of the cup washer. The rear panel 180 may be provided with a first ventilation hole 181 to allow ventilation between the inside and outside of the cup washer. Air introduced into a drying module 132 to be described below may be introduced to the inside of the

cup washer through the first ventilation hole 181.

[0091] On the rear panel 180 a handle 260 that allows a user or manager to hold the cup washer for easy movement of the cup washer may be coupled.

[0092] The cup washer may include a display part 190 coupled to the upper side of the rear supporter 162 and disposed at one side of the door 150. The display part 190 may be disposed at one side of the door 150 to protrude from the door 150.

[0093] Therefore, the user can view the display part 190 from the front of the cup washer. The display part 190 may display various information about the use of the cup washer in the form of images, text, and videos.

[0094] While viewing the information displayed on the display part 190, the user may operate the cup washer or become aware of the operating status of the cup washer. Additionally, the display part 190 may be provided with, for example, a capacitive touch-type command input means. Therefore, the user can control the operation of the cup washer using the display part 190.

[0095] The cup washer may include a first circuit board part 220 and a board part supporter 230. The first circuit board part 220 may be disposed at one side of the water tank 120, and be provided with a controller that controls the operation of the cup washer. The first circuit board part 220 may be disposed at one side of the water tank 120 in the lower side of the cup washer, where there is a free space, since the water tank has a relatively smaller volume compared to the washing part 130.

[0096] The board part supporter 230 may be coupled to the base plate 110 at its lower side, coupled to the intermediate plate 140 at its upper side, and coupled with the first circuit board part 220. The board part supporter 230 may be stably coupled to the base plate 110 by a coupling mechanism.

[0097] The circuit board supporter 230 may be used not only to secure the first circuit board part 220, but also to secure tubings disposed at the lower side of the cup washer.

[0098] The cup washer may include an outer packaging part 250 which is coupled to the rear panel 180 and covers the rear supporter 162. To the rear supporter 162 a number of fastening mechanisms may be coupled for the coupling with other components of the cup washer.

[0099] Therefore, in the case of a structure in which the rear supporter 162 to which the fastening mechanism is fastened is exposed to the outside as it is, the visual aesthetic feeling of the cup washer may be deteriorated. Therefore, there is a need for a structure which covers the rear supporter 162 to which the fastening mechanism has been fastened.

[0100] The outer packaging part 250 may cover the rear supporter 162 and be coupled with a relatively smaller number of fastening mechanisms compared to the rear supporter 162. The outer packaging part 250 with such a structure can make the cup washer look neat overall by being disposed at a position corresponding to the rear supporter 162 outside the cup washer.

[0101] Hereinafter, the specific structure of the washing part 130 will be described in detail with reference to drawings. FIG.6 is a perspective view showing the washing part 130 according to an embodiment. FIG.7 is a front view showing the washing part 130 according to an embodiment.

[0102] FIG.8 is a side view showing the washing part 130 according to an embodiment. FIG.9 is a rear view showing the washing part 130 according to an embodiment. The washing part 130 may include a tub 131, a drying module 132, a sump 133, a circulation pump 134, and a drain pump 135.

[0103] The tub 131 may provide a space where a cup is accommodated, and allow a washing water to be sprayed. In the tub 131 a rack on which a cup is rested may be provided, and a spray means for spraying water may be provided at the bottom. The open top of the tub 131 may be opened and closed by the door 150.

[0104] The drying module 132 may be disposed at one side of the tub 131 so as to be connected to the tub 131, and may spray heated air for drying into the inside of the tub 131. After the washing of the cup 10 with water has been completed, moisture remains on the surface of the cup. The drying module 132 may dry the cup by spraying the heated air, that is, warm air, onto the cup to dry the water remaining on the cup.

[0105] The drying module 132 may be provided with a heating device for heating the air introduced into the drying module 132. Additionally, the drying module 132 may be provided with a blower fan 1321 that forces the air to flow through a path formed in the drying module 132.

[0106] The sump 133 may be disposed at the lower side of the tub 131 so as to be connected with the tub 131, and may store water to be sprayed in the tub 131. The water stored in the sump 133 may be circulated through the tub 131 and the sump 133 by the circulation pump 134, and be sprayed in the tub 131 by the spray device to wash the cup 10 accommodated in the tub 131.

[0107] The circulation pump 134 may be disposed at the lower side of the tub 131 so as to be connected with the tub 131 and the sump 133, and may circulate water between the tub 131 and the sump 133. The circulation pump 134 may force water to flow from the sump 133 to the tub 131.

[0108] The circulation pump 134 may be connected with the spray device disposed at the lower side of the tub 131. Therefore, when the circulation pump 134 operates, the water stored in the sump 133 may be introduced into the spray device, and be sprayed to the inside of the tub 131 by the spray device to wash the cup.

[0109] The drain pump 135 may be disposed at the lower side of the tub 131 so as to be connected with the sump 133, and discharge water from the sump 133 to the outside. When the washing of the cup with water has been completed, the drain pump 135 may operate so that the water stored in the sump 133 can be discharged to the outside of the cup washer through a drain tubing connected with the drain pump 135.

[0110] The washing process of the cup 10 with the use of water stored in the water tank 120 is as follows. Water may be introduced into the water tank 120 from the city water through a tubing, and be stored therein. The water in the water tank 120 may be heated by the heating device provided in the water tank 120. The heated hot water in the water tank 120 may be introduced into the tub 131 through a tubing, and be stored in the sump 133 disposed at the lower side of the tub 131.

[0111] When the circulation pump 134 operates to wash the cup, the hot water may pass from the sump 133 through the spray device, and be sprayed to the inside of the tub 131 to wash the cup. The hot water sprayed in the tub 131 may be introduced back into the sump 133, be introduced back into the spray device by the circulation pump 134, and be sprayed into the inside of the tub 131 by the spray device.

[0112] While the circulation pump 134 is operating, the hot water for washing may flow sequentially through the sump 133, the spray device, and the tub 131, and this flow may be repeated. When the cup washing with hot water has been completed, the circulation pump 134 may stop, and the drain pump 135 may operate to discharge the water stored in the sump 133 to the outside.

[0113] When the drainage by the drain pump 135 has been completed, the drying module 132 may operate to spray warm air to the inside of the tub 131, and after the warm air has been sprayed for a set period of time, a cup washing operation including the drying process may be completed.

[0114] The cup washer may proceed with a washing with a detergent and a rinsing with a rinse agent at the same time. Hereinafter, a structure provided for inputting a detergent and a rinse agent into the tub will be specifically described.

[0115] Meanwhile, in the cup washing process with hot water, the washing process using a detergent and the rinsing process using a rinse agent may be separated from each other. After completing the process of washing the cup with hot water mixed with a detergent, the water in the sump 133 contains the detergent and foreign substances. Therefore, this contaminated water may be discharged to the outside by activating the drainage pump 135.

[0116] After the contaminated water has been discharged to the outside, a rinsing operation may proceed by introducing hot water to the sump 133 again, mixing a rinse agent into the hot water, and activating the circulation pump 134. In this way, the washing process using a detergent and the rinsing process using a rinse agent can be separated, thereby increasing the washing efficiency of the cup washer.

[0117] The washing part 130 may include a detergent storage part 136, a rinse storage part 137, a detergent injection part 138, a rinse injection part 139, a detergent pump 1301, and a rinse pump 1302.

[0118] The detergent storage part 136 may be disposed at the rear of the tub 131, and store a detergent.

The rinse storage part 137 may be disposed separately from the detergent storage part 136 at the rear of the tub 131, and store a rinse. Therefore, detergent and rinse may not mix with each other.

[0119] The top cover 210 may be provided with a detergent feeding entrance 211 to which a detergent is input and a rinse feeding entrance 212 to which a rinse agent is input. The detergent feeding entrance 211 may be connected with the detergent storage part 136, and the rinse feeding entrance 212 may be connected with the rinse storage part 137. Accordingly, the detergent and rinse introduced to the detergent feeding entrance 211 and rinse feeding entrance 212 can be stored in the detergent storage part 136 and rinse storage part 137.

[0120] The detergent injection part 138 may be connected with the detergent storage part 136 and the tub 131, and may inject the detergent to the tub 131. The inlet of the detergent injection part 138 may be connected with the detergent storage part 136, and the outlet thereof may be connected to the tub 131.

[0121] The rinse injection part 139 may be connected with the rinse storage part 137 and the tub 131, and may inject the rinse to the tub 131. The inlet of the rinse injection part 139 may be connected with the rinse storage part 137, and the outlet thereof may be connected with the tub 131.

[0122] The detergent pump 1301 may be connected with the detergent injection part 138, and pump the detergent to the tub 131. The rinse pump 1302 may be connected with the rinse injection part 139, and pump the rinse to the tub 131. The operation of the detergent pump 1301 and the rinse pump 1302 may be controlled by the controller.

[0123] The controller may activate the detergent pump 1301 to mix detergent and water during the washing process, and may activate the rinse pump 1302 to mix rinse and water during the rinsing process.

[0124] The water tank 120 may be provided to be connected with the tube 131 via a tubing so that the water in the water tank 120 can be introduced to the tub 131. Accordingly, the water in the water tank 120 can be heated to become hot water, then be introduced to the tub 131, and be stored in the sump 133 until the circulation pump 134 is activated.

[0125] Meanwhile, as described above, the tub 131 may be provided with a water supply path directly connected with the city water. Therefore, depending on the user's choice, a cup can progress to a normal washing or a quick washing.

[0126] In the normal washing, the cup may be washed using the hot water heated in the water tank 120, and using detergent and rinse, thereby being capable of achieving the clean cup washing, but it may take a relatively long period of time.

[0127] In the quick washing, the cup may be washed using room temperature raw water supplied from the city water without using any detergent or rinse, thus making the washing time shorter, and, therefore, it may be con-

veniently used by a user who wants to quickly wash a cup that is relatively less contaminated.

[0128] FIG. 10 is a cross-sectional view showing a tub 131 and a rack 400 according to an embodiment. FIG. 11 is a perspective view showing a rack 400 according to an embodiment. The cup washer according to an embodiment may include the washing part 130 washing the cup accommodated therein. The washing part 130 may include the tub 131 and the rack 400.

[0129] The tub 131 may provide a space where a cup is accommodated, and allow a washing water to be sprayed to the inside thereof. The rack 400 may be provided inside the tub 131, allow a cup to be placed thereon, and be formed by coupling a plurality of wires with each other. For example, on the rack 400 a cup, a cup lid 12, a straw 11, and the like may be rested.

[0130] At this time, the cup 10 may be rested upside down on the rack 400. That is, the open entrance of the cup may be placed at the lower side of the rack 400, and the bottom of the cup may be placed at the upper side of the rack 400. Accordingly, water sprayed upward from the lower side of the rack 400 can be smoothly introduced into the inside of the cup and wash the inside of the cup.

[0131] The rack 400 may be formed generally into a three-dimensional mesh structure by coupling wires with each other. Due to such a shape, a cup or the like can be easily rested on the rack 400, and the sprayed water can pass through the lower side of the rack 400 to easily wash the cup or the like rested on the rack 400.

[0132] The rack 400 may include a bottom portion 410, a side portion 420, and a tine 430. The bottom portion 410 may be placed in the tub 131, and support from below a cup placed on the rack 400. In order to stably support the cup or the like, the bottom part 410 may be provided in a form that is generally widely spread out front, rear, left and right in a lateral direction of the tub 131.

[0133] The side portion 420 may be formed to protrude in one side of the tub 131, and support from one side a cup placed on the rack 400. The side portion 420 may protrude in an upward direction of the tub 131, and stably support the side surface of the cup placed on the rack 400.

[0134] The tine 430 may protrude from the bottom portion 410 in an upward direction of the tub 131, and when a cup is placed on the rack 400, at least a portion of the tine 430 may be disposed inside the cup. The tine 430 may be provided in a plural number so that the tines 430 can be spaced apart from each other at an appropriate distance.

[0135] The tine 430 may be provided in a rod shape, and disposed such that the longitudinal direction thereof is generally in an up and down direction of the tub 131. Accordingly, the cup, the lid 12, the straw 11, and the like can be stably supported by the tine 430.

[0136] The bottom portion 410 may include an edge portion 411, a first slope portion 412, and a first bend portion 413. The edge portion 411 may form the edge of the bottom portion 410, and be formed so that a portion

thereof in each of the opposite sides protrudes in an upward direction of the tub 131.

[0137] In a portion in each of the opposite sides of the edge portion 411 a protruding edge 4111 may be formed so as to protrude. The protruding edge 4111 may be provided to contact with the inner surface of the side wall of the tub 131 so that when the rack 400 is shaken laterally, it contacts with the tub 131 and restricts the movement of the rack 400, thereby enabling the rack 400 to maintain a stable position in the tub 131.

[0138] Additionally, the protruding edge 4111 may act as a handle when the manager places the rack 400 into or removes it from the tub 131.

[0139] The first slope portion 412 may be disposed so that its longitudinal direction being inclined with respect to the lateral direction of the tub 131. The first slope portion 412 may be provided in a plural number, and they may be disposed at positions spaced apart from each other. Accordingly, the plurality of first slope portions 412 can form the bottom surface of the rack 400 on which a cup and the like are placed.

[0140] Since the plurality of first slope portions 412 have an incline, the cup placed on the first slope portions 412 can be rested on the rack 400 generally obliquely with respect to the up and down direction of the tub 131. Since the cup is rested obliquely, one side of the cup can lean against the side portion 420, and be supported by the side portion 420.

[0141] Due to such a structure, the cup can be supported simultaneously by the bottom portion 410 and the side portion 420, and thus the cup can be generally stably rested on the rack 400.

[0142] The first bend portion 413 may be bent from the first slope portion 412, and coupled to the edge portion 411. In order for the first slope portion 412 to have a structure with an incline, the first bend portion 413 may be formed at one end of the first slope portion 412.

[0143] The first bend portion 413 may be provided in a plural number, and the first bend portions 413 may be disposed to be spaced apart from each other, and each of the first bend portions 413 may extend from each of the first slope portions 412.

[0144] The side portion 420 may include a vertical portion 421, a second bend portion 422, a second slope portion 423, and a horizontal portion 424. The vertical portion 421, the second bend portion 422, and the second slope portion 423 may be respectively provided in a plural number. Each of the vertical portion 421, the second bend portion 422, and the second slope portion 423 may be spaced apart from another to form a region where a cup or the like can be rested.

[0145] In an embodiment, the vertical portion 421, second bend portion 422 and second slope portion 423 of the side portion 420, and the first slope portion 412 and first bend portion 413 of the bottom portion 410 may be formed integrally, and every portion may be formed by bending a single wire.

[0146] The vertical portion 421 may have one end

coupled to the edge portion 411, and be disposed with its longitudinal direction in the up and down direction of the tub 131. The second bend portion 422 may be bent from the vertical portion 421, and be disposed with its longitudinal direction in the lateral direction of the tub 131.

[0147] The second slope portion 423 may have one end connected to the second bend portion 422 and the other end connected to the first slope portion 412, and be disposed with its longitudinal direction being inclined with respect to the up and down direction of the tub 131. The cup placed obliquely on the rack 400 by the first slope portion 412 of the bottom portion 410 may be supported at a portion of its side surface by the second slope portion 423. Due to such a structure, the cup can be supported at the bottom by the first slope portion 412, and supported at the side by the second slope portion 423.

[0148] The horizontal portion 424 may be disposed with its longitudinal direction in the lateral direction of the rack 400, and be fixedly coupled with each of the side section 420 provided in a plural number. The horizontal section 424 may be coupled to, for example, each of the plurality of vertical portions 421. By coupling the horizontal portion 424 with each of the plurality of side portions 420, the horizontal portion can serve to ensure that each side portion 420 maintains a designed distance from another without being deformed.

[0149] In an embodiment, the cup rested on the rack 400 may be supported at its lower side by the first slope portion 412 of the bottom portion 410, and supported at the side by the second slope portion 423 of the side portion 420. Accordingly, the cup can be rested generally obliquely on the rack 400, so that not only the lower side of the cup but also the side portion of the cup can be supported by the rack 400. Therefore, the rack 400 according to the embodiment can allow the cup to be more stably rested thereon when compared to a structure in which the cup is supported only at the lower side.

[0150] FIG. 12 is a side view showing a rack 400 according to an embodiment. FIG. 13 is an enlarged view of a portion of the rack 400 illustrated in FIG. 12. The tine 430 may be provided to protrude from the first slope portion 412 of the bottom portion 410 with the longitudinal direction being disposed generally in the up and down direction of the tub 131, and disposed in a slightly oblique form with respect to the up and down direction of the tub 131 since the first slope portion 412 has a slope.

[0151] The tine 430 may be provided in a plural number so that they are disposed to be spaced apart from each other. Due to such a structure, a cup lid 12 can be, for example, disposed between the plurality of tines 430. The lid 12 may be rested on a rack 400 while being supported by a plurality of tines 430.

[0152] Meanwhile, since the upper end of the tine 430 is not connected to other part, the reusable straw 11 can be rested on the rack 400 by being inserted around the tine 430 when washing the straw 11. In order for the straw 11 to be stably rested on the tine 430, the tine 430 needs to have a structure by which the rested straw 11 is tightly

held.

[0153] To this end, the tine 430 according to the embodiment may have a slope portion formed therein so that the inserted straw 11 is kept tight without being loosened. Specifically, the tine 430 may include a first section 431, a second section 432, and a third section 433, and these sections may be formed integrally.

[0154] The first section 431 may protrude from the bottom portion 410. The first section 431 may protrude from the first slope portion 412 of the bottom portion 410 with the longitudinal direction being generally perpendicular to the first slope portion 412.

[0155] The second section 432 may extend from the first section 431 with the longitudinal direction being inclined with respect to the longitudinal direction of the first section 431. The third section 433 may extend from the second section 432 with the longitudinal direction being inclined with respect to the longitudinal direction of the second section 432. Additionally, the first section 431 and the third section 433 may be disposed so that their longitudinal directions are parallel to each other.

[0156] Due to such a structure, as shown in FIG. 12, the cross-sectional area of the tine 430 can be expanded when viewed in the longitudinal direction. Because of the expansion of the cross-sectional area of the tine 430, the straw 11 can be tightly rested on the tine 430.

[0157] That is, a portion of the straw 11 may be in contact with the first section 431 to be supported by the first section 431, and another portion of the straw 11 may be in contact with the third section 433 to be supported by the third section 433.

[0158] Due to such a structure, the straw 11 can be stably supported by the tine 430, so that the straw 11 can be prevented from being removed from the tine 430 due to an external impact such as a sprayed water, while the straw 11 can be stably rested on the rack 400 during the washing process. Additionally, due to the second section 432 having a slope, the straw 11 can be stably rested on the tine 430 while reducing the length of the tine 430.

[0159] In an embodiment, the tine 430 may include the second section 432 provided to be inclined with respect to another section. Accordingly, the straw 11 can be tightly rested on the tine 430 while at the same time the length of the tine 430 can be effectively reduced, so that the straw 11 can remain stably rested on the rack 400 even under an external impact such as a sprayed water.

[0160] FIG. 14 is a perspective view showing a rack 400 additionally including a first flow path guide part 440 according to an embodiment. FIG. 15 is an enlarged side view of a portion of the rack 400 shown in FIG. 14.

[0161] The tub 131 may include a detergent inlet 1312, a rinse inlet 1311, and a washing water inlet 1315. The detergent inlet 1312 may be connected with the detergent pump 1301 via a tubing, so that the detergent pumped from the detergent pump 1301 can be introduced into the tub 131 through the detergent inlet 1312.

[0162] In addition, the rinse inlet 1311 may be connected with the rinse pump 1302 via a tubing, so that the

rinse pumped from the rinse pump 1302 can be introduced into the tub 131 through the rinse inlet 1311. The washing water inlet 1315 may be connected with the water tank 120 via a tubing, so that water discharged from the water tank 120 can be introduced into the tub 131 through the washing water inlet 1315.

[0163] The water introduced from the water tank 120 may be stored in the sump 133, and then flow to circulate through the sump 133 and the tub 131 while washing a cup and the like accommodated in the tub 131. For effective washing and rinsing of the cup, the water introduced into the tub 131 needs to be smoothly mixed with the detergent or the rinse.

[0164] The washing water inlet 1315 may be disposed at a location spaced apart from the detergent inlet 1312 or the rinse inlet 1311. As a result, the water introduced through the washing water inlet 1315 fails to come into contact with the detergent or rinse introduced into the tub 131, and the water is introduced into the sump 133 located at the bottom of the tub 131, and likewise, the detergent or rinse is introduced into the sump 133, after which the water and the detergent or rinse can be mixed.

[0165] Since the flow of water is not very active when the water is stored in the sump 133, in the case where the water is mixed with detergent or rinse in the sump 133, the water may not mix well with the detergent or rinse.

[0166] Therefore, in order to increase the mixing efficiency, it is necessary to mix water, detergent, and rinse with each other near the respective inlets where water, detergent, and rinse are introduced into the tub 131. Since the water flows actively especially at the inlet of the tub 131, the mixing of detergent or rinse with the water can occur smoothly when the mixing occurs near the respective inlets of the tub 131. Such a structure will be described below.

[0167] The tub 131 may include the washing water inlet 1315, the detergent inlet 1312, and the rinse inlet 1311. The washing water inlet 1315, the detergent inlet 1312, and the rinse inlet 1311 may be formed in the rear of the tub 131. Meanwhile, the tub 131 may include an outer panel 131a and an inner panel 131b.

[0168] The outer panel 131a may form the outer shape of the tub 131. Since a number of other components are mounted on the outer panel 131a, it may be provided with structures for fastening coupling mechanisms, which are constructed with somewhat complexity to secure the space where these components are mounted.

[0169] The inner panel 131b may be disposed on the inner side of the outer panel 131a, and have a relatively simple structure. The inner panel 131b may have a shape corresponding to the inner shape of the outer panel 131a, and be provided to cover all or part of the inner surface of the outer panel 131a.

[0170] Since the outer panel 131a is provided with a complex shape, it may be manufactured from a material with good formability, for example, a plastic material. The inner panel 131b may be formed from a material, such as stainless steel, that can provide aesthetic feeling to the

user and have excellent corrosion resistance as its surface comes into contact with water and foreign substances.

[0171] In this way, the tub 131 is provided with the outer panel 131a and the inner panel 131b manufactured separately from materials that accord with the required characteristics, thereby reducing the manufacturing cost and at the same time ensuring the required corrosion resistance and aesthetic feeling.

[0172] The water, detergent, and rinse may be introduced into the inside of the tub 131 by passing through the entire tub 131. Accordingly, the detergent inlet 1312, the rinse inlet 1311, and the washing water inlet 1315 may be formed to penetrate through the outer panel 131a and the inner panel 131b.

[0173] The detergent inlet 1312 may be formed to penetrate through one side of the tub 131, and serve as a passage through which detergent is introduced. The washing water inlet 1315 may be disposed in the upper side of the detergent inlet 1312, and serve as a passage through which the washing water inlet 1315.

[0174] The rinse inlet 1311 may be disposed to be spaced apart from the detergent inlet 1312, and serve as a passage through which rinse is introduced. The rinse inlet 1311 may be disposed at the same or similar height as the detergent inlet 1312, and disposed in a position lower than the detergent inlet 1312.

[0175] The rack 400 may include a first flow path guide part 440. The first flow path guide part 440 may be coupled with the bottom part 410, and disposed to face the washing water inlet 1315 so that water introduced from the washing water inlet 1315 can be directed toward detergent introduced through the detergent inlet 1312. In addition, the first flow path guide part 440 may guide the flow direction of water introduced through the washing water inlet 1315 so that the water is directed toward the rinse introduced through the rinse inlet 1311.

[0176] The first flow path guide part 440 may be disposed at the rear of the tub 131, and disposed at a location adjacent to the washing water inlet 1315. Accordingly, water introduced through the washing water inlet 1315 and poured to the inside of the tub 131 can collide against the first flow path guide part 440 to change its flow path.

[0177] The first flow path guide part 440 may include a base part 441 and a first pad 442. The base part 441 may be coupled with the bottom portion 410. The base part 441 may be formed to protrude at the rear of the bottom portion 410, and formed generally by bending the wire.

[0178] The first pad 442 may be coupled to the base part 441, and disposed at a location corresponding to the washing water inlet 1315 to change the flow direction of water introduced into the tub 131. The first pad 442 may be formed in a curved shape when viewed in a cross section to guide water to flow in the downward direction of the tub 131.

[0179] The first pad 442 may be disposed to directly face the washing water inlet 1315. Accordingly, the water

introduced through the washing water inlet 1315 can be sprayed toward the first pad 442, and collide against the first pad 442 so that the flow direction can be changed to the downward direction of the tub 131.

[0180] The first pad 442 may have a cross-section formed in a curved line, and the lower end of the first pad 442 may have a surface curved to face toward the direction of the washing water inlet 1315. Accordingly, the water colliding against the first pad 442 can flow downward due to gravity, and approach the wall surface of the tub 131.

[0181] Meanwhile, the detergent inlet 1312 and the rinse inlet 1311 may be disposed in the lower side of the washing water inlet 1315. The detergent and rinse introduced through the detergent inlet 1312 and rinse inlet 1311 may have relatively high viscosities, and may flow down along the wall surface of the tub 131.

[0182] Since the water colliding against the first pad 442 flows downward and approaches the wall surface of the tub 131, it can come into contact with the detergent or rinse flowing down along the wall surface of the tub 131. Therefore, the water flowing inside the tub 131 may come into contact with the detergent or rinse.

[0183] Due to such a structure, the flowing water comes into contact with the detergent or rinse at a location before it is introduced into the sump 133, so the water can be smoothly mixed with the detergent or rinse compared to the case where the detergent and rinse are mixed with the water staying in the sump 133.

[0184] During the washing process, the controller provided in the cup washer may control the operation of the detergent pump 1301 or the rinse pump 1302 so that detergent or rinse is introduced into the tub 131 at the time when water is introduced into the tub 131 through the washing water inlet 1315. Accordingly, the detergent or rinse can be mixed with the flowing water, so that the water and the detergent or rinse can be smoothly mixed with each other.

[0185] In an embodiment, the rack 400 may be provided with the first flow path guide part 440 that guides the flow direction of water to a location adjacent to the washing water inlet 1315 of the tub 131. Thus, the water introduced into the tub 131 can flow toward the detergent or rinse by the first flow guide part 440. As a result, the flowing water can be mixed with the detergent or rinse, so the water and the detergent or rinse can be smoothly mixed with each other, improving the washing efficiency of the cup washer.

[0186] FIG. 16 is a perspective view showing a rack 400 additionally including an air inlet hole 1316 according to an embodiment. FIG. 17 is a view showing a rack 400 at a region where an air inlet hole 1316 is disposed. The tub 131 may include the air inlet hole 1316 and a guide cone 1317.

[0187] The air for drying may be introduced to the air inlet hole 1316. The air inlet hole 1316 may be formed to penetrate through the tub 131, and connected with the drying module 132. Therefore, the air heated in the drying

module 132, that is, the hot air, can be sprayed into the inside of the tub 131 through the air inlet hole 1316.

[0188] The warm air sprayed into the tub 131 through the air inlet hole 1316 can dry the washing objects, such as a cup, rested on the rack 400 by evaporating water remaining on the cup and the like, thereby providing convenience to the user.

[0189] The guide cone 1317 may be disposed inside the tub 131 to be connected with the air inlet hole 1316, and guide the flow of warm air introduced into the tub 131. The guide cone 1317 may be formed roughly in the form of a hollow horn or cone.

[0190] When viewed with the air flow direction as a reference, the inlet of the guide cone 1317 may be connected with the air inlet hole 1316, and the outlet 1317a of the guide cone 1317 may be disposed to be directed toward a washing object such as a cup rested on the rack 400.

[0191] The guide cone 1317 may be provided with a flow path formed therein, through which air flows, and whose cross-sectional area decreases as it goes in the outlet direction of the guide cone 1317. Due to such a structure, an increased flow speed of air can be obtained at the outlet 1317a of the guide cone 1317, so that the air discharged through the outlet 1317a of the guide cone 1317 can smoothly reach the cup or the like.

[0192] The guide cone 1317 may be provided to be inclined with respect to the lateral direction of the tub 131 so that it is directed upward as it goes in the outlet direction. Due to such a structure, the outlet 1317a of the guide cone 1317 can be disposed at a location closer to a cup or the like rested on the rack 400.

[0193] The guide cone 1317 may be provided so that the outlet is disposed in the lower side of the first slope portion 412. Due to such a structure, the air can be discharged from the guide cone 1317 in the lower side of the first slope portion 412 on which the cup and the like are rested, and be smoothly sprayed onto the cup and the like rested on the first slope portion 412.

[0194] FIG. 16 illustrates a state in which a cup is washed and dried while rested on the rack 400. Referring to FIG. 16, due to the above-described structure of the guide cone 1317, the outlet 1317a of the guide cone 1317 can be disposed directly below the cup at a location corresponding to the open portion of the cup.

[0195] Accordingly, since the warm air introduced into the tub 131 from the drying module 132 flows along the guide cone 1317 which has an upward slope and a structure whose cross-sectional area decreases as it approaches the outlet, the warm air discharged from the outlet 1317a of the guide cone 1317 can flow into the inside of the cup through the open portion of the cup located directly above with an increased speed.

[0196] In an embodiment, the guide cone 1317 can be provided to allow the air for drying to flow therethrough and be introduced to the inside of the tub 131, and the guide cone 1317 can guide the flow of air introduced into the tub 131 so that the air can be directed from the outlet

directly to the washing objects such as a cup and the like.

[0197] Due to such a structure, by using the guide cone 1317 to spray air directly onto the cup or the like, the drying efficiency of the cup washer can be significantly improved compared to the case where the warm air is evenly sprayed to the entire washing part 130.

[0198] FIG.18 is a view showing an auxiliary outlet 1318 and a second flow path guide part 450 according to an embodiment. In the tub 131, the water may be circulated through the tub 131 and the sump 133 to wash the cup and the like. If water is excessively stored inside the tub and the water level in the tub 131 rises, the cup and the like placed on the rack 400 may be partially submerged in the water.

[0199] In such a case, foreign substances contained in the circulating water may adhere to the cup and the like, so it is required to prevent the cup from being submerged in the water. To this end, the tub 131 may be provided with the auxiliary outlet 1318.

[0200] The tub 131 may include the auxiliary outlet 1318 which is disposed at a height corresponding to the height of the bottom portion 410, and which discharges water outside the tub 131 to control the water level inside the tub 131.

[0201] Accordingly, when the water level in the tub 131 reaches the bottom portion 410 of the rack 400, the water can be discharged to the outside through the auxiliary outlet 1318, and thus, the water level in the tub 131 does not rise any further, and the cup and the like rested on the rack 400 can be prevented from being submerged in the water.

[0202] Meanwhile, the water can be introduced into the tub 131 from outside the tub 131 through the auxiliary outlet 1318. For example, when the drain pump 135 operates and the water contaminated by being used for washing is drained to the outside, some of the contaminated water may be introduced into the tub 131 through the auxiliary outlet 1318.

[0203] That is, the contaminated water can flow back into the tub 131 through the auxiliary outlet 1318. This is because the water drained to the outside through the auxiliary outlet 1318 and the water drained to the outside using the drain pump 135 are drained to the outside of the cup washer through the same drain tubing.

[0204] Since the water flowing back in this way may contaminate the cup or the like rested on the rack 400, the rack 400 may include a second flow path guide part 450 to suppress the flowing back of the water. The second flow path guide part 450 may be disposed at a location corresponding to the auxiliary outlet 1318, and guide the flow path of water introduced to the inside of the tub 131 from the auxiliary outlet 1318.

[0205] The second flow path guide part 450 may be disposed to directly face the auxiliary outlet 1318, and change the flow direction of the water flowing back through the auxiliary outlet 1318 to the tub 131 to be directed to the lower side of the tub 131, thereby suppressing the contaminated water flowing back from spil-

ling onto the cup or the like rested on the rack 400 and contaminating the cup.

[0206] The second flow path guide part 450 may include a second pad 451, a third pad 452, and a fitting hole 453. The second pad 451 can be collided by the water introduced from the auxiliary outlet 1318, and thus guide the water to flow toward the lower side of the tub 131.

[0207] The second pad 451 may be disposed to face the auxiliary outlet 1318, and block the flow path of the water sprayed from the auxiliary outlet 1318. Accordingly, the water sprayed from the auxiliary outlet 1318 can collide against the second pad 451, and flow in the downward direction of the tub 131 by gravity. Accordingly, the contaminated water flowing back can be suppressed from coming into contact with the washing object, such as the cup, disposed on the opposite side of the auxiliary outlet 1318 with the second pad 451 interposed therebetween.

[0208] The third pad 452 may be bent from the second pad 451, and suppress the water introduced from the auxiliary outlet 1318 from flowing in an upward direction of the tub 131. The third pad 452 may be bent toward the auxiliary outlet 1318.

[0209] Accordingly, the third pad 452 can suppress the water sprayed from the auxiliary outlet 1318 from flowing in the upward direction of the tub 131 and in the opposite-side direction of the tub 131. The water sprayed from the auxiliary outlet 1318 may collide against the second pad 451, so that some of it may flow in the downward direction of the tub 131, while the remainder may flow in the upward direction or opposite-side direction of the tub 131.

[0210] The water flowing in the upward direction or opposite-side direction of the tub 131 may collide against the third pad 452 again, and eventually flow in the downward direction of the tub 131 by gravity. Accordingly, the contaminated water flowing back into the tub 131 through the auxiliary outlet 1318 can be blocked by the second pad 451 and the third pad 452 so as not to come into contact with the cup or the like rested on the rack 400.

[0211] The fitting hole 453 may be formed to penetrate through the third pad 452, and provided to fit the second flow path guide part 450 to the edge part 411. The second flow path guide part 450 can be mounted on the edge portion 411 of the rack 400 through the fitting hole 453.

[0212] Although the present invention has been described with reference to the drawings provided as examples, the present invention is not limited by the drawings and embodiments disclosed in this disclosure, and it is obvious that various modifications can be made by those skilled in the art without departing from the scope of the technical idea of the present invention. In addition, even if operational effects according to the configuration of the present invention were not explicitly described while explaining the embodiments of the present invention, it is natural that the effects that can be predicted by that configuration should also be acknowledged.

Claims

1. A cup washer comprising:

a washing part washing a cup accommodated therein, wherein the washing part includes:

a tub providing a space to accommodate a cup; and
a rack provided inside the tub and allowing a cup to be rested thereon, and wherein the rack includes:

a bottom portion supporting from below a cup placed on the rack;
a side portion formed to protrude in one side of the tub, and supporting a cup from one side; and
a tine protruding from the bottom portion in an upward direction of the tub.

2. The cup washer of claim 1, wherein the bottom portion includes:

an edge portion forming an edge of the bottom portion, and formed so that a portion thereof protrudes in an upward direction of the tub;
a first slope portion disposed with its longitudinal direction being inclined with respect to a lateral direction of the tub; and
a first bend portion bent from the first slope portion, and coupled to the edge portion.

3. The cup washer of claim 2, wherein the side portion includes:

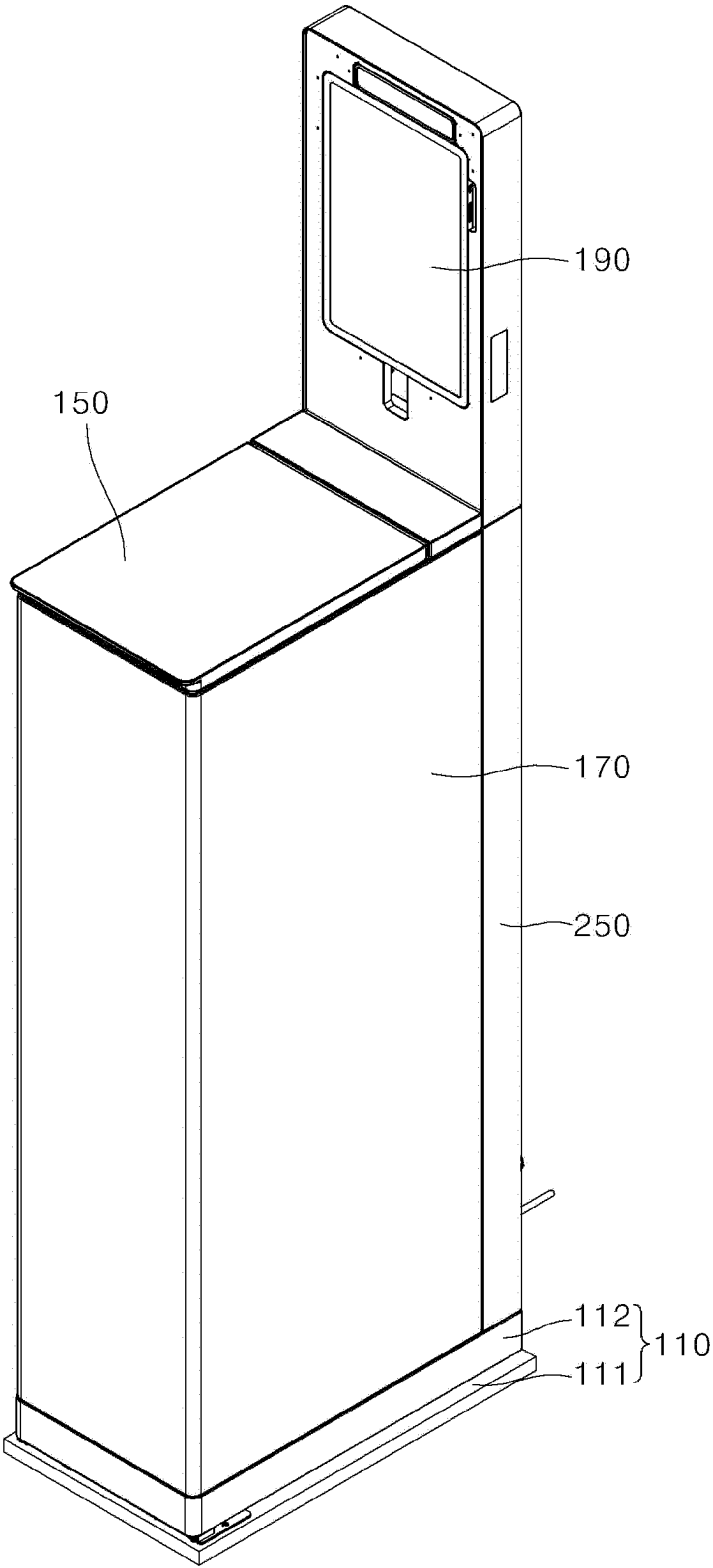
a vertical portion having one end coupled to the edge portion, and disposed with its longitudinal direction in an up and down direction of the tub;
a second bend portion bent from the vertical portion; and
a second slope portion extending from one end of the second bend portion, and disposed with its longitudinal direction being inclined with respect to an up and down direction of the tub 131.

4. The cup washer of claim 1, wherein the tine includes:

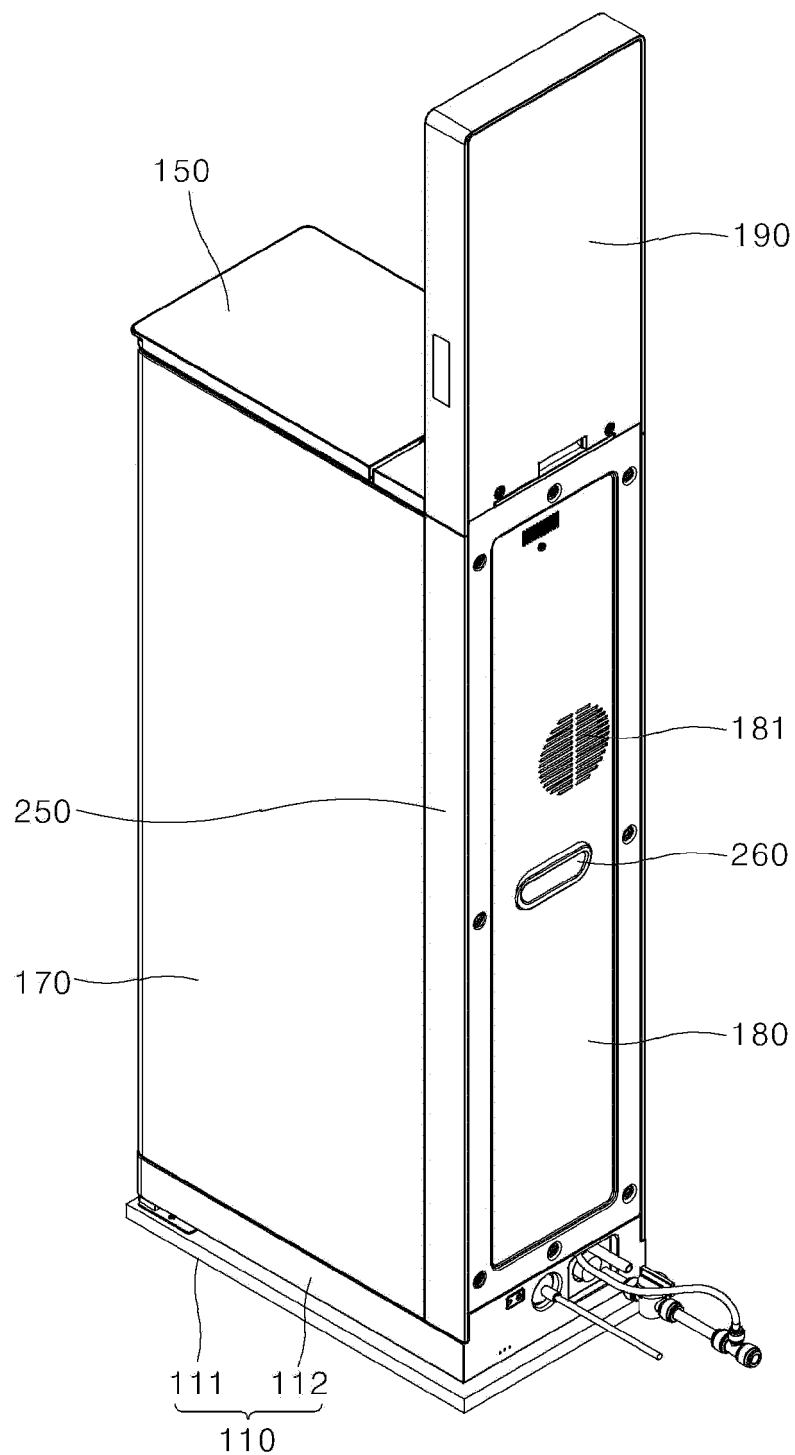
a first section protruding from the bottom portion;
a second section extending from the first section, and disposed with its longitudinal direction being inclined with respect to the longitudinal direction of the first section; and
a third section extending from the second section, and disposed with its longitudinal direction being inclined with respect to the longitudinal direction of the second section.

5. The cup washer of claim 4, wherein the first section and the third section are disposed so that their longitudinal directions are parallel to each other.
6. The cup washer of claim 1, wherein the tub is provided with
 - a detergent inlet introducing detergent; and
 - a washing water inlet disposed in an upper side of the detergent inlet, and introducing water into the tub, and
 - wherein the rack includes:
 - a first flow path guide part coupled with the bottom portion, and disposed to face the washing water inlet and guide a flow direction of water.
7. The cup washer of claim 6, wherein the first flow path guide part includes:
 - a base part coupled with the bottom portion; and
 - a first pad coupled to the base part, disposed at a location corresponding to the washing water inlet to change a flow direction of water introduced into the tub, and formed in a curved shape when viewed in a cross section to guide water to flow in a downward direction of the tub.
8. The cup washer of claim 7, wherein the tub is provided with a rinse inlet disposed to be spaced apart from the detergent inlet, and introducing rinse, and wherein the first flow path guide part directs water introduced through the washing water inlet toward rinse introduced through the rinse inlet.
9. The cup washer of claim 2, wherein the tub is provided with
 - an air inlet hole introducing air for drying; and
 - a guide cone connected with the air inlet hole, and guiding a flow of warm air introduced into the tub.
10. The cup washer of claim 9, wherein the guide cone is provided with a flow path formed therein, through which air flows, and whose cross-sectional area decreases as it goes in an outlet direction of the guide cone.
11. The cup washer of claim 9, wherein the guide cone is provided to be directed upward as it goes in an outlet direction.
12. The cup washer of claim 9, wherein the guide cone is provided so that its outlet is disposed in a lower side of the first slope portion.
13. The cup washer of claim 2, wherein the tub is provided with an auxiliary outlet disposed at a height corresponding to a height of the bottom portion, and discharging water outside the tub, and wherein the rack includes a second flow path guide part disposed at a location corresponding to the auxiliary outlet, and guiding the flow path of water introduced to the inside of the tub from the auxiliary outlet.
14. The cup washer of claim 13, wherein the second flow path guide part includes:
 - a second pad guiding water introduced from the auxiliary outlet to flow in a downward direction of the tub;
 - a third pad bent from the second pad, and suppressing water introduced from the auxiliary outlet from flowing in an upward direction of the tub; and
 - a fitting hole formed to penetrate through the third pad.
15. The cup washer of claim 8, wherein the tub includes:
 - an outer panel; and
 - an inner panel disposed inside the outer panel, and
 - wherein the detergent inlet, the rinse inlet, and the washing water inlet are formed to penetrate through the outer panel and the inner panel.

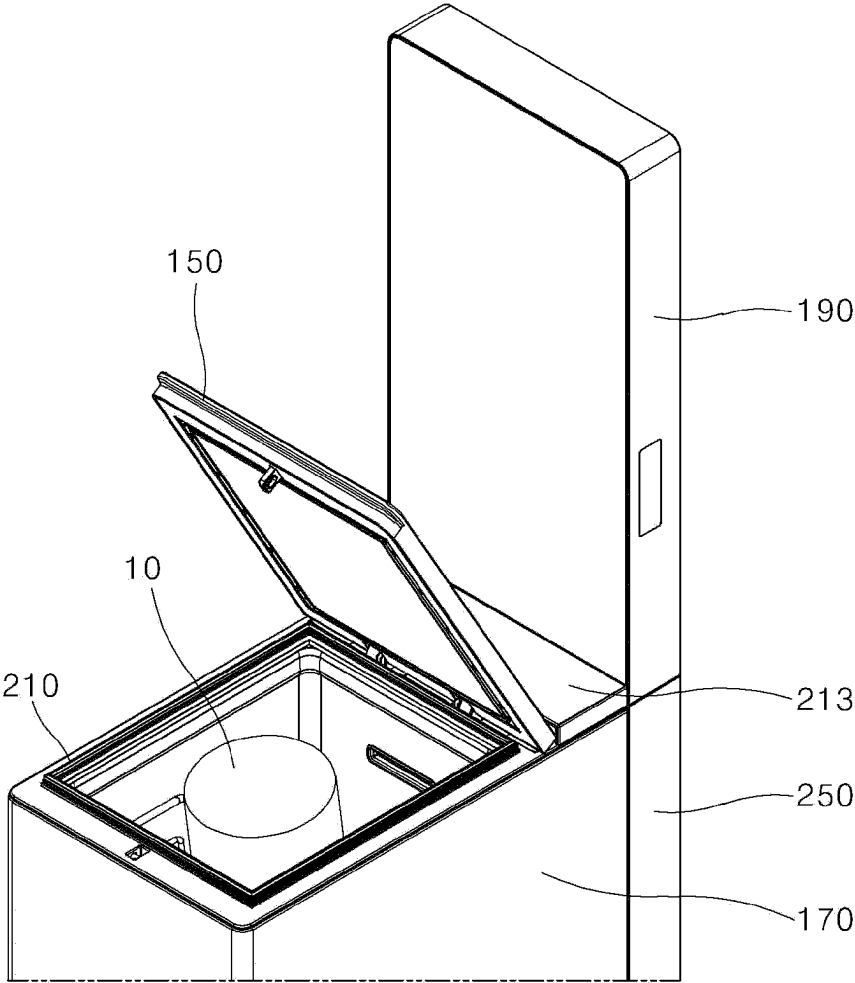
【FIG. 1】



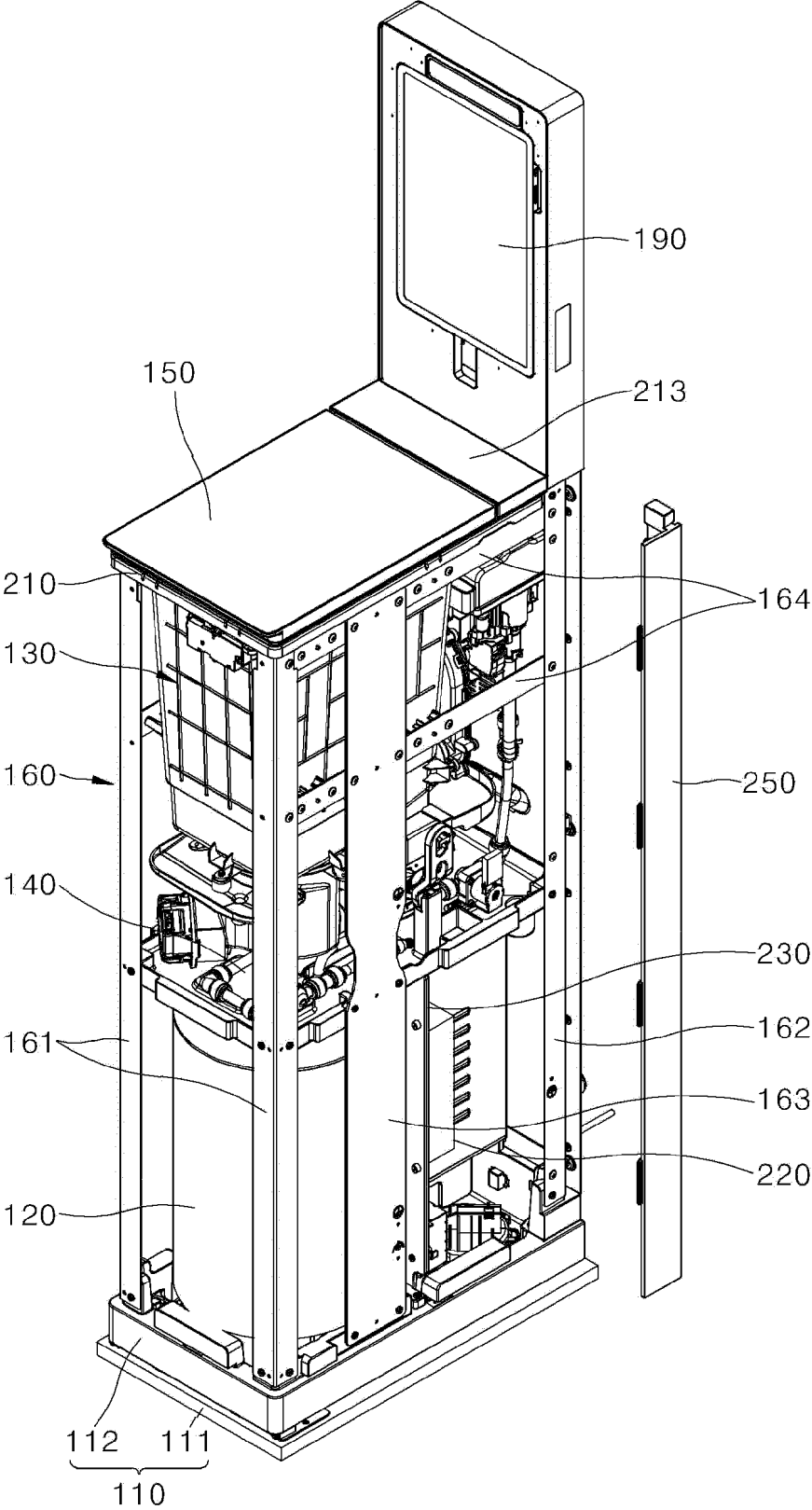
【FIG. 2】



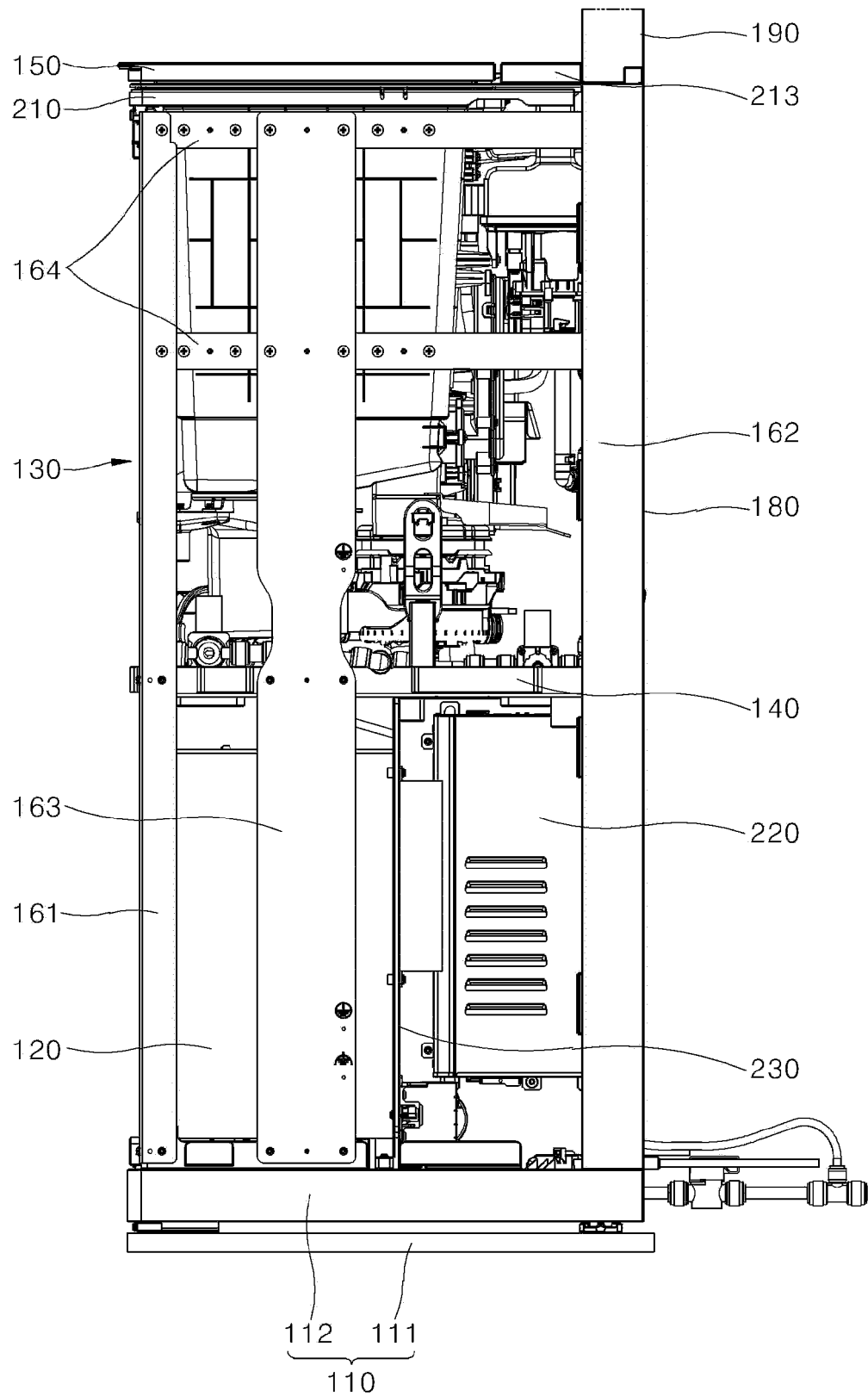
【FIG. 3】



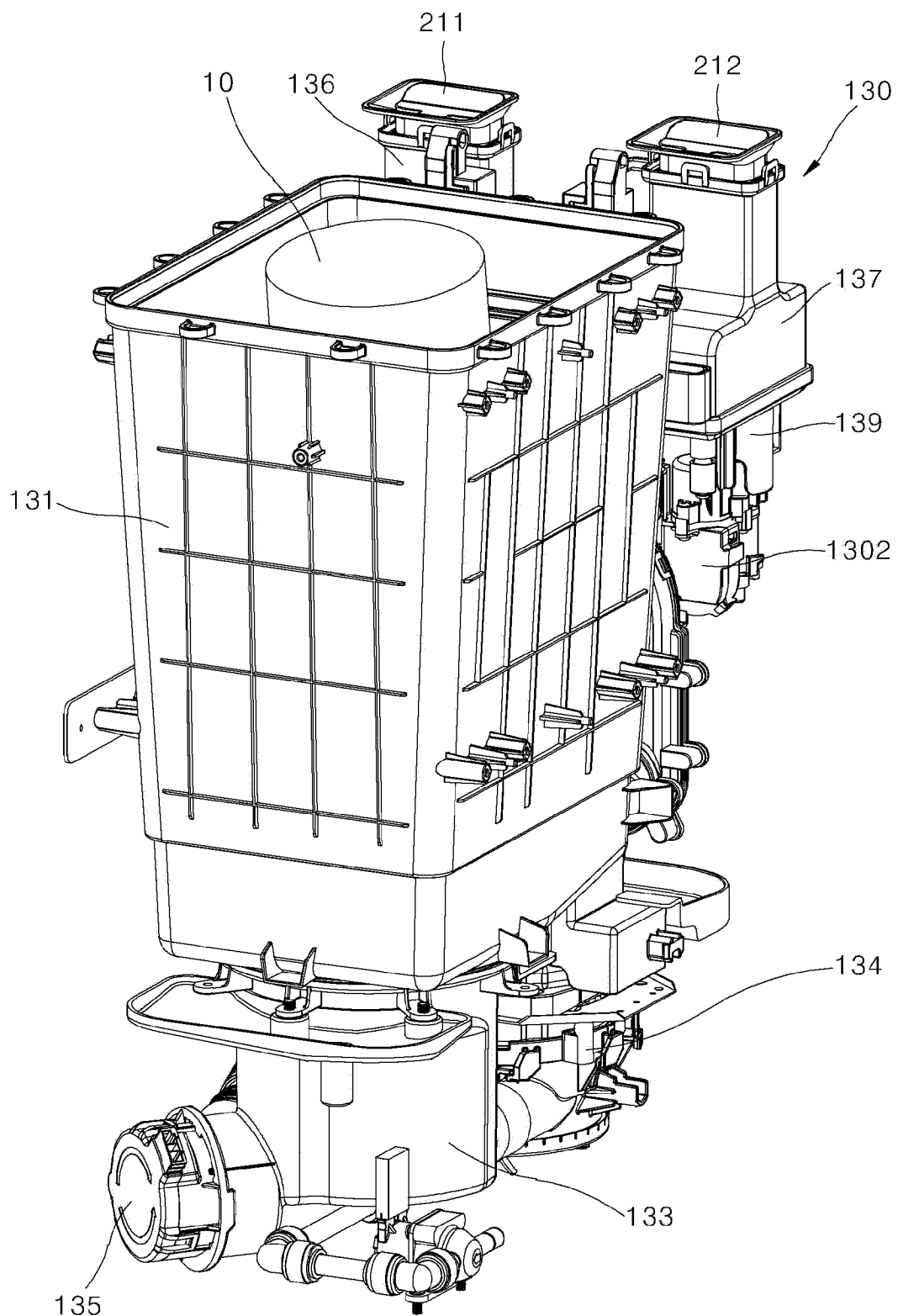
【FIG. 4】



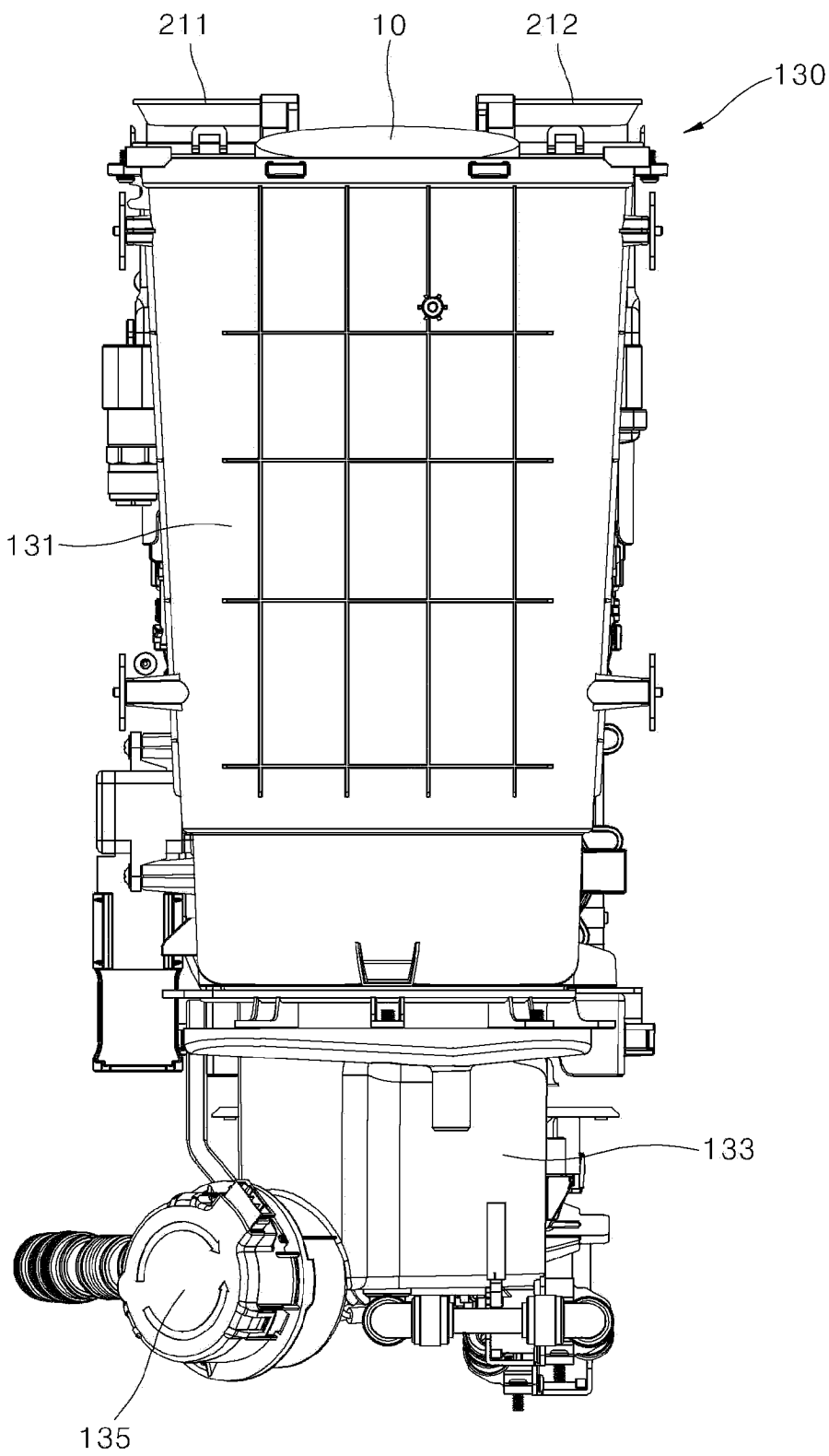
【FIG. 5】



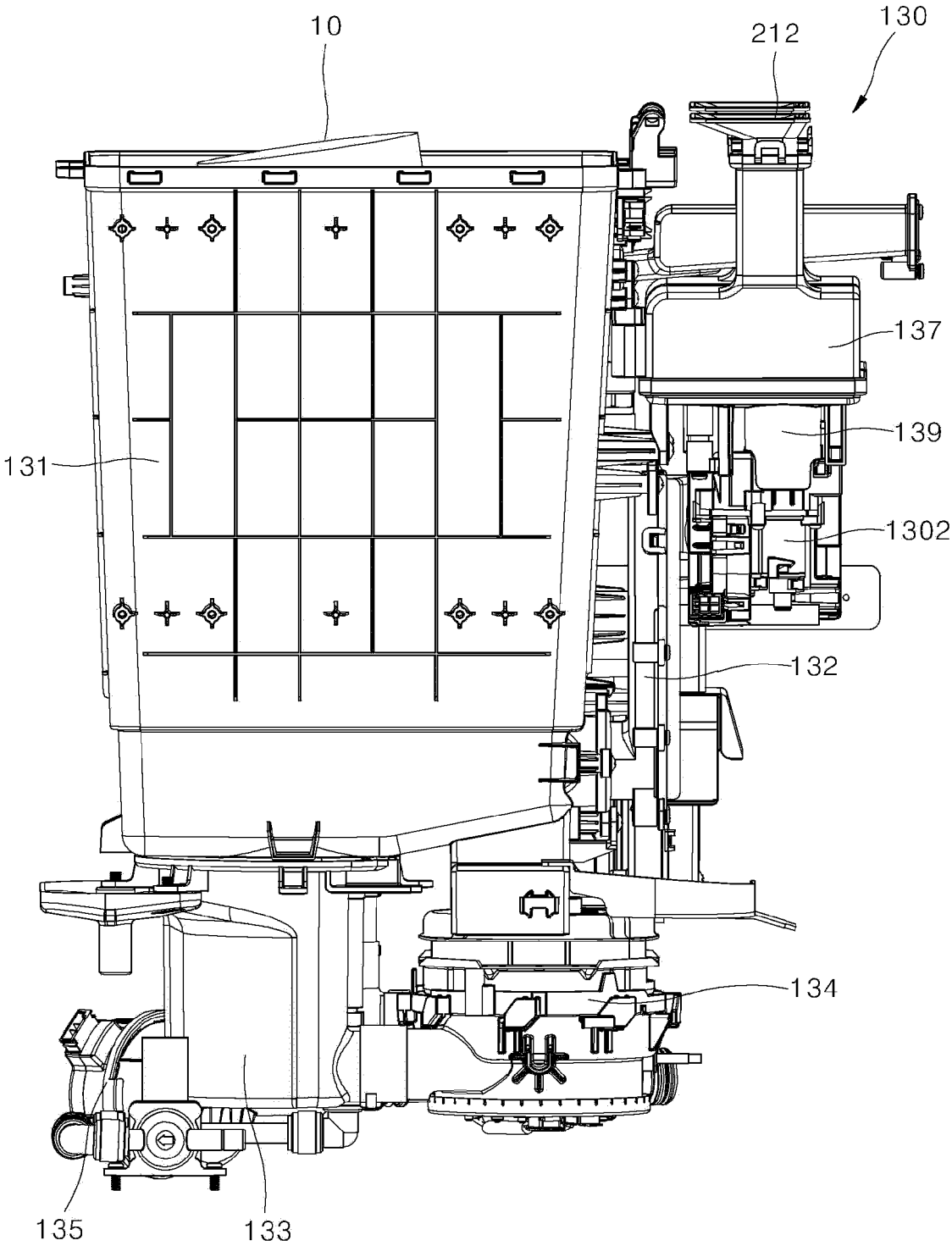
【FIG. 6】



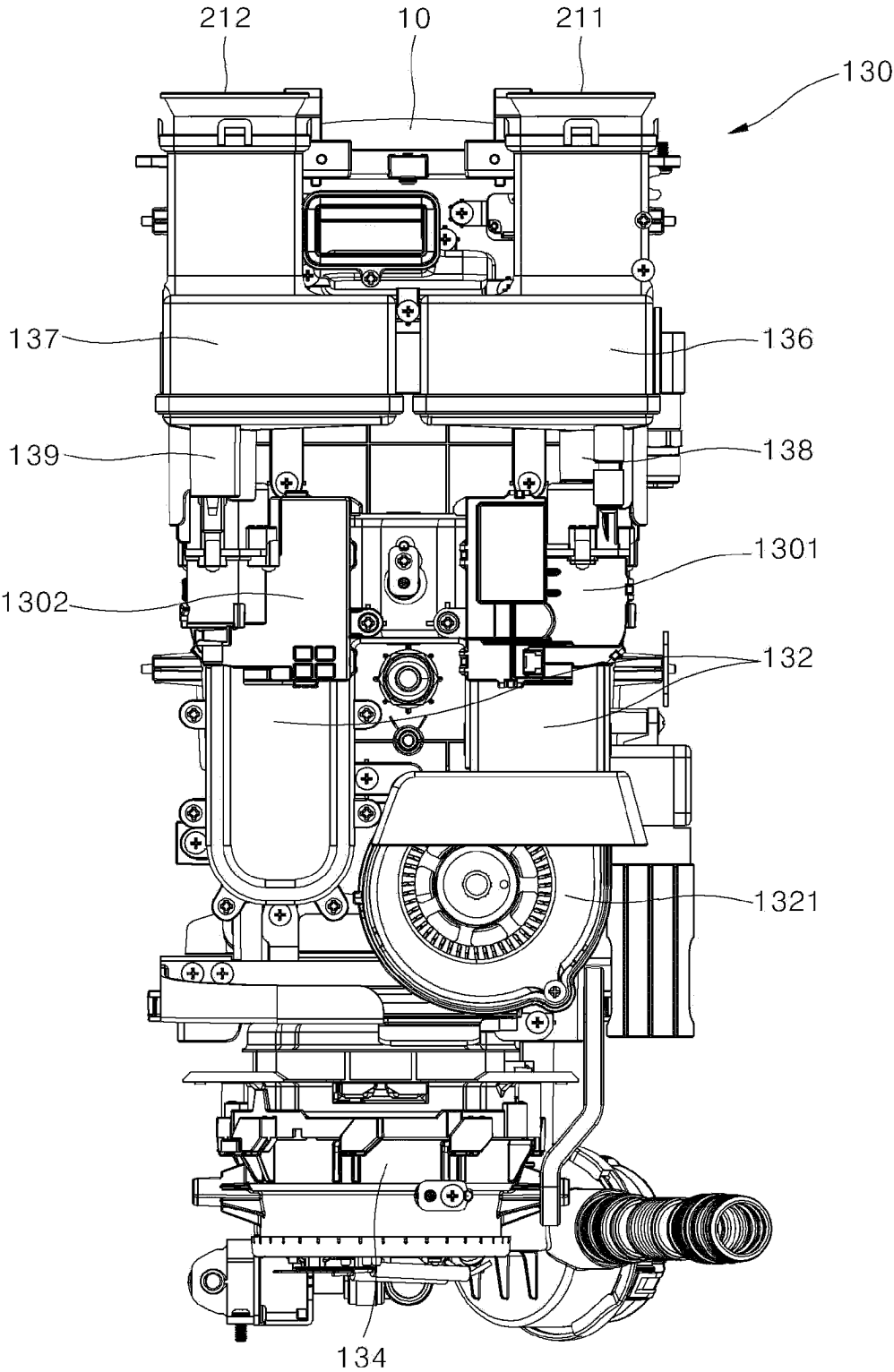
【FIG. 7】



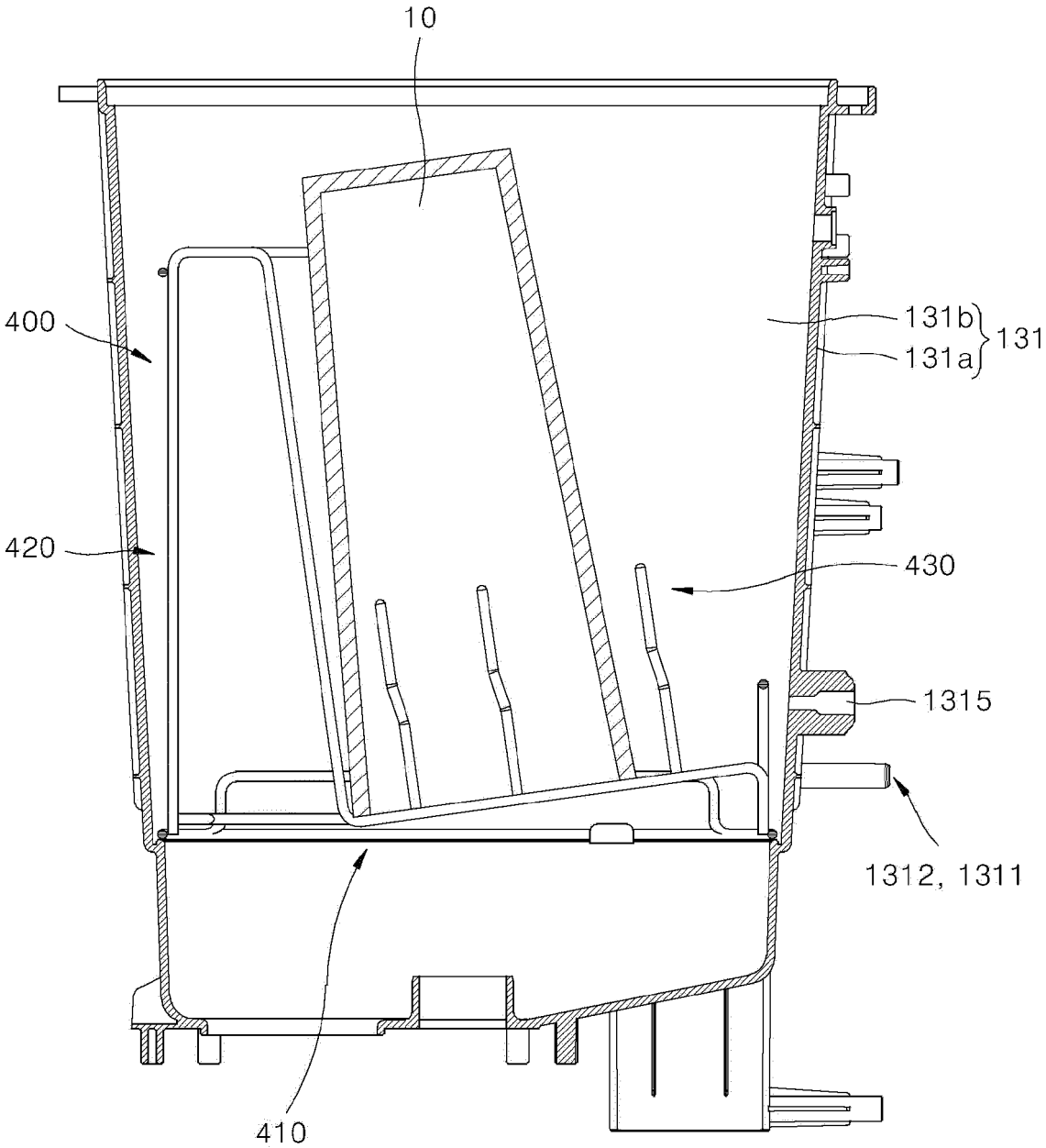
【FIG. 8】



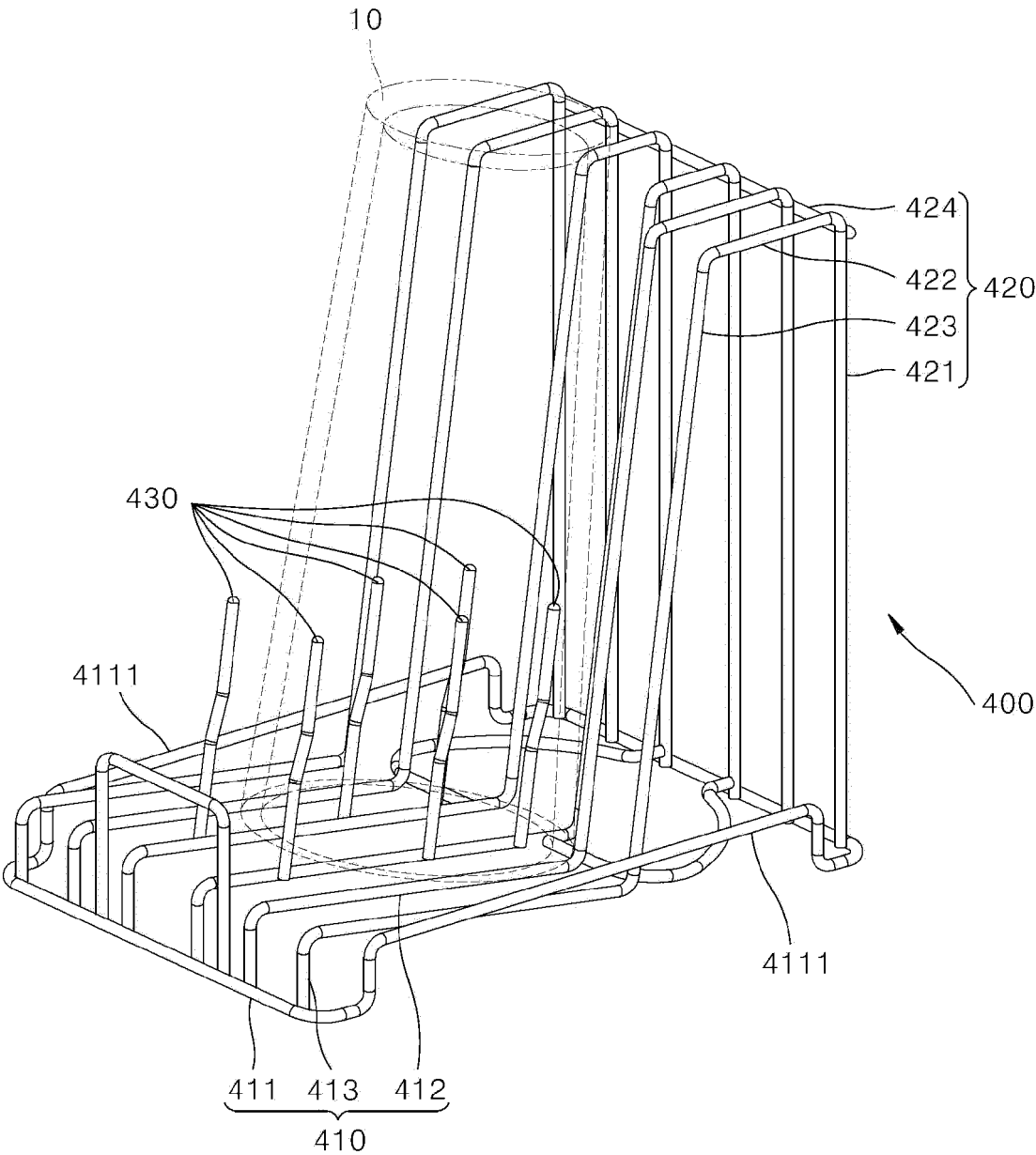
【FIG. 9】



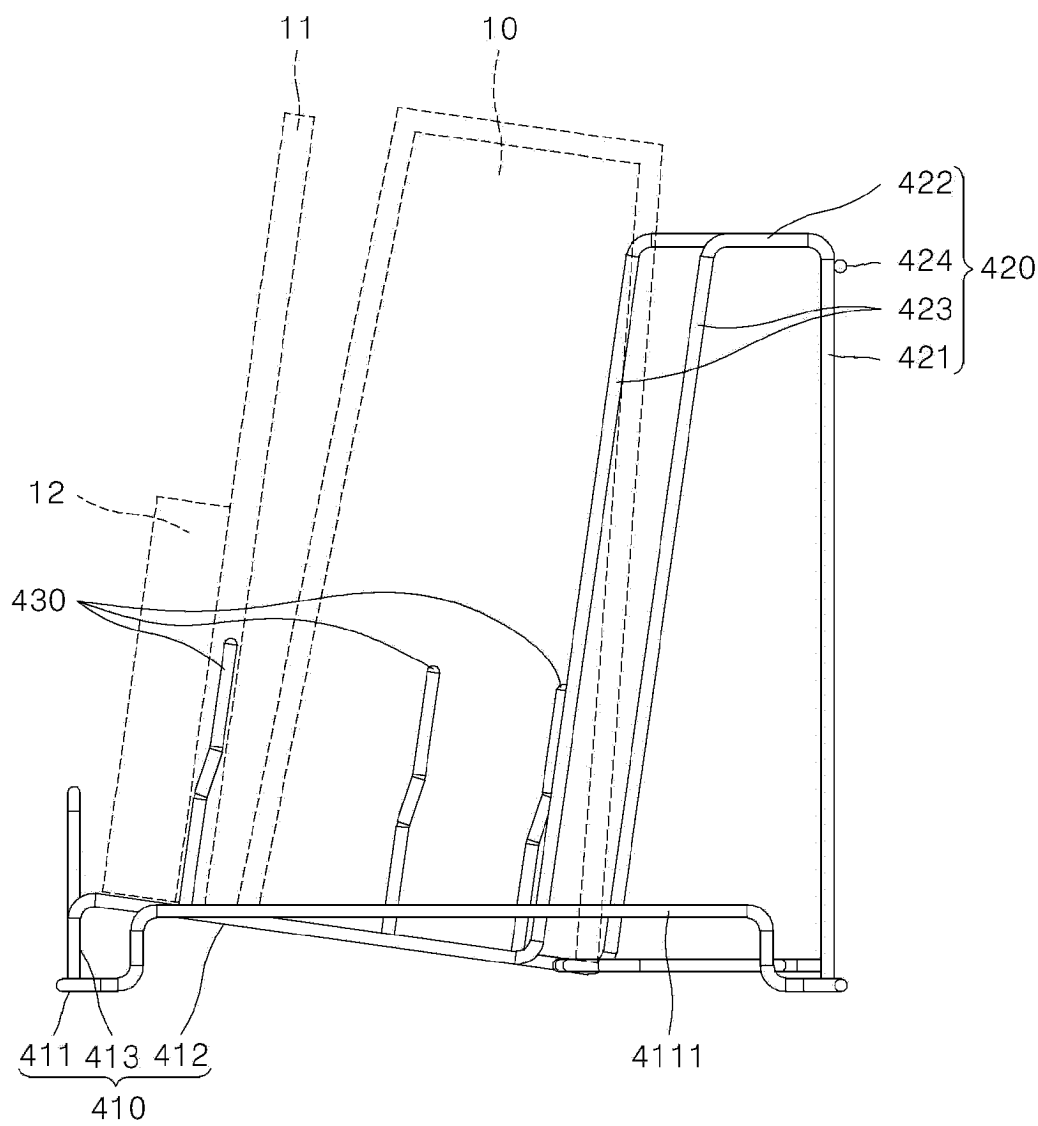
【FIG. 10】



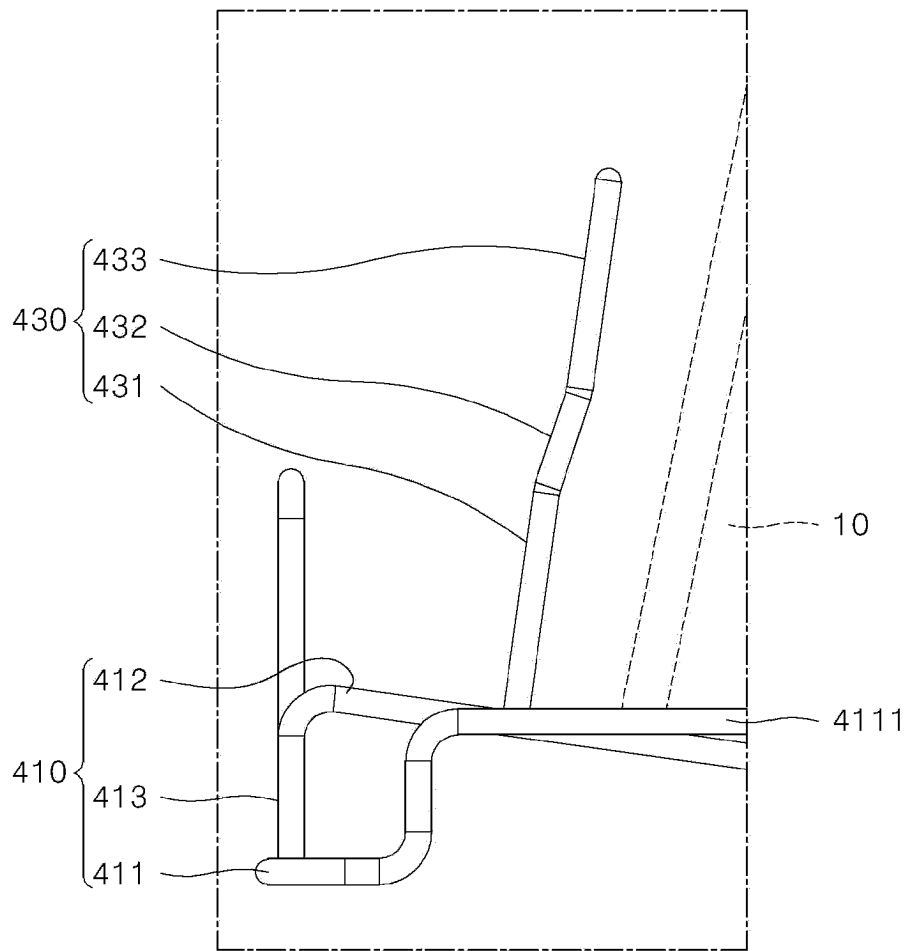
【FIG. 11】



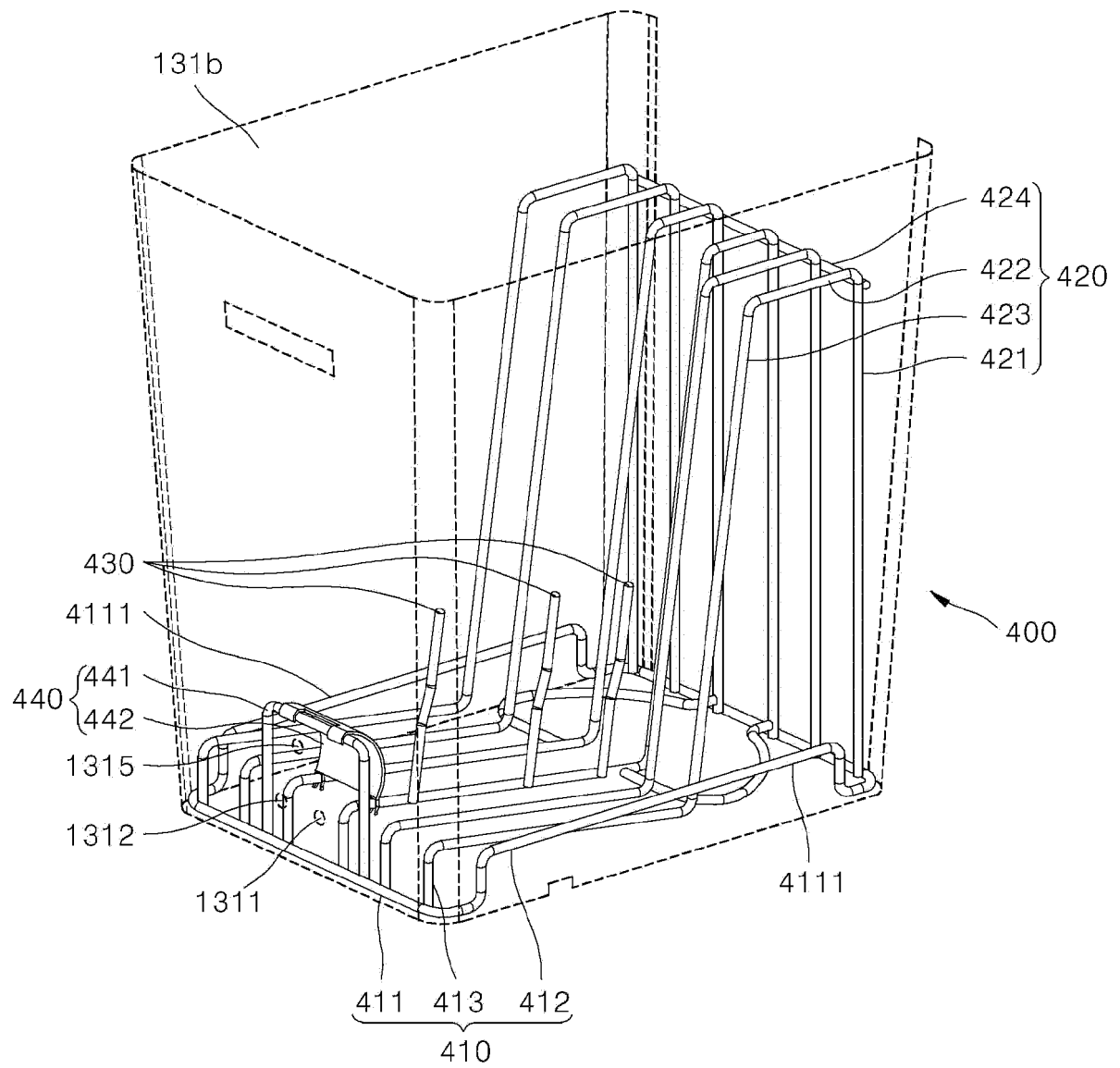
【FIG. 12】



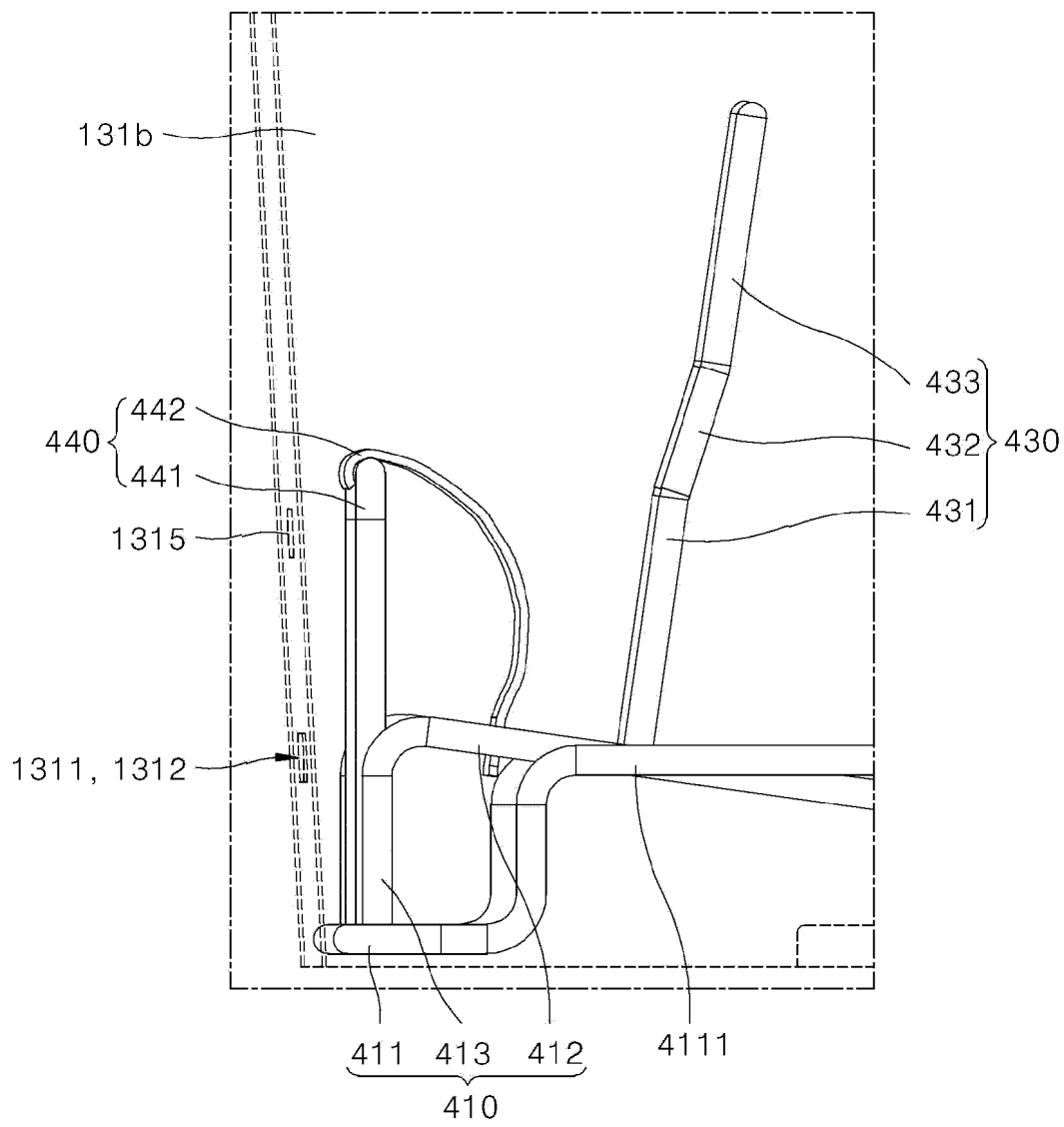
【FIG. 13】



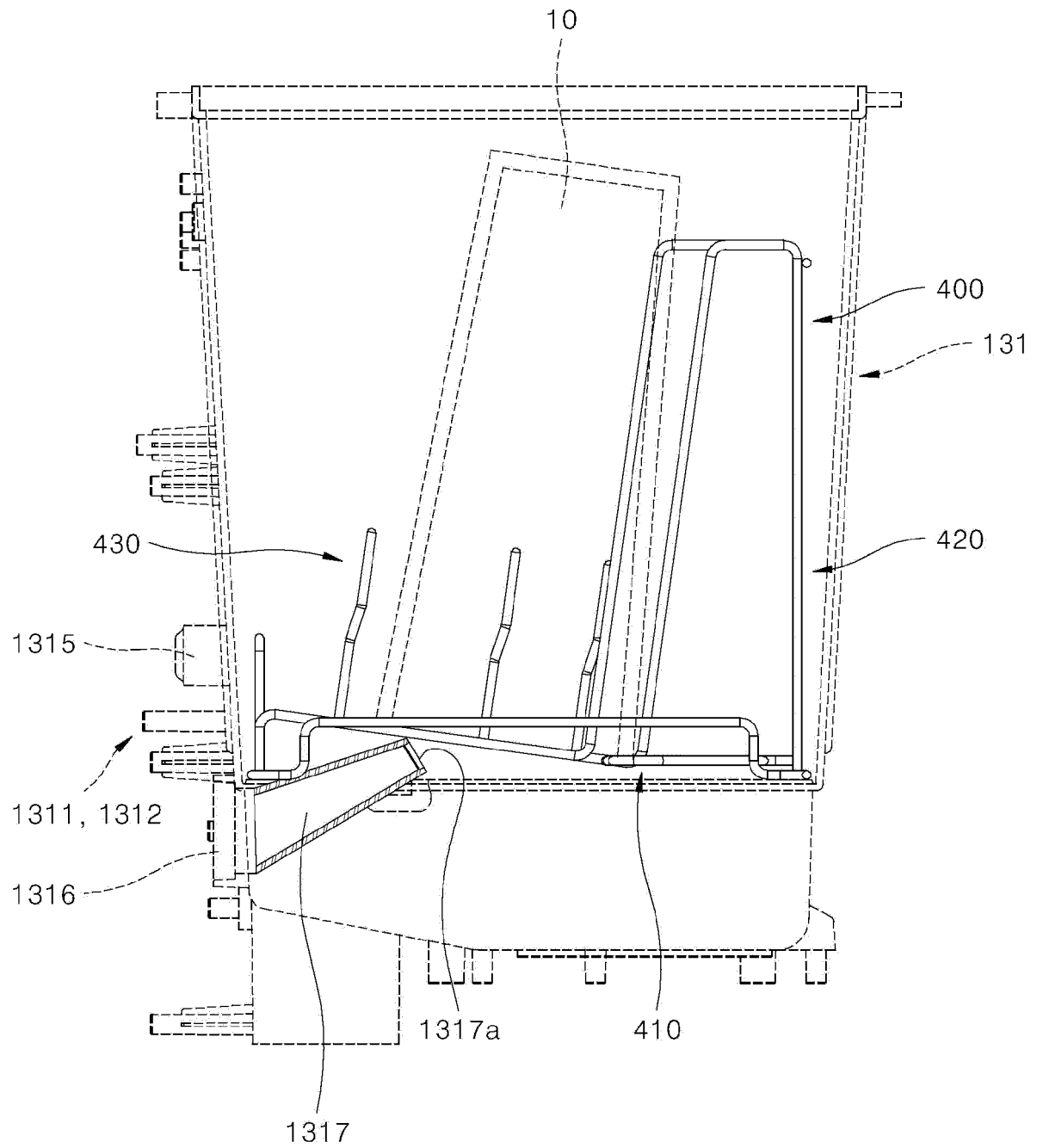
【FIG. 14】



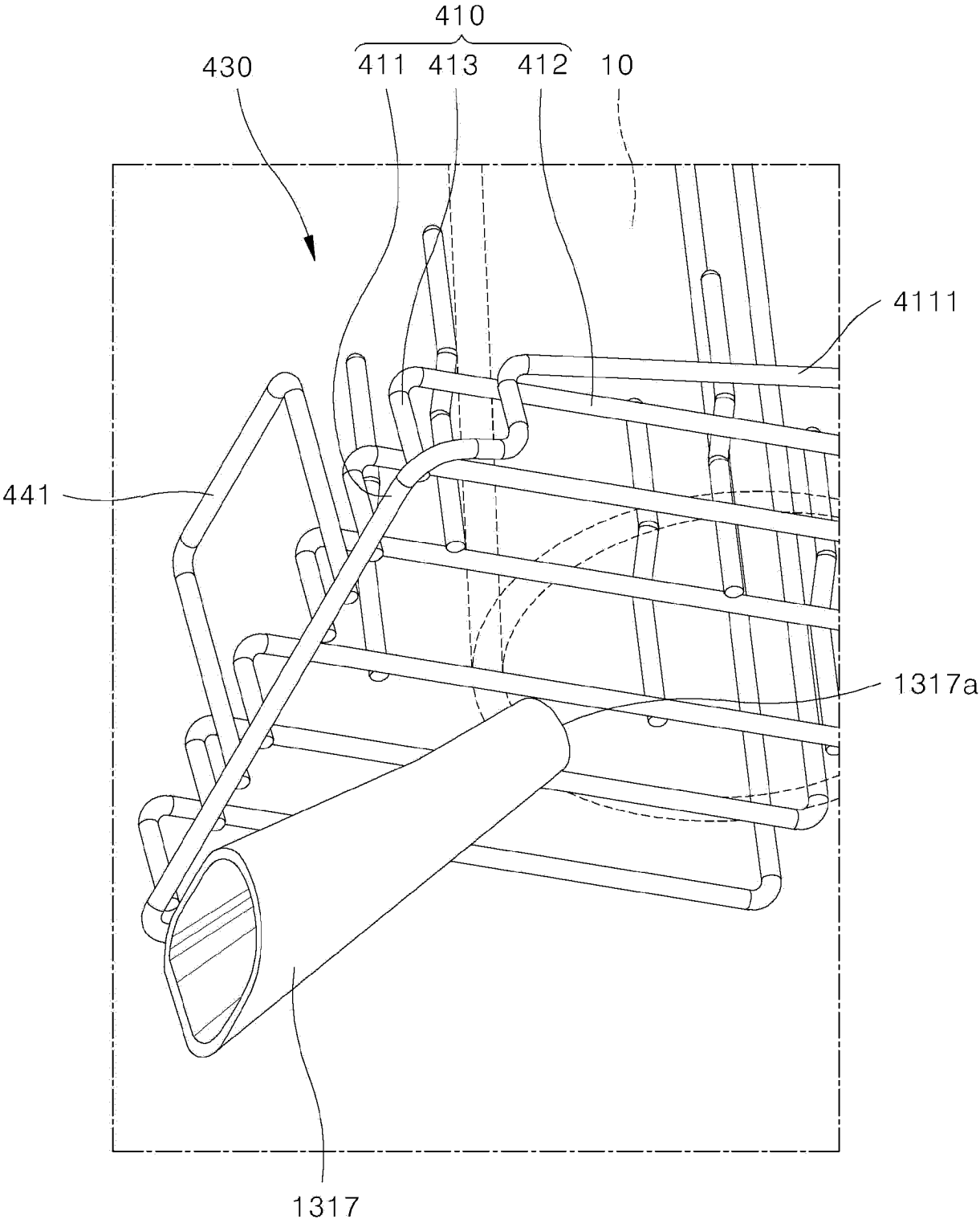
【FIG. 15】



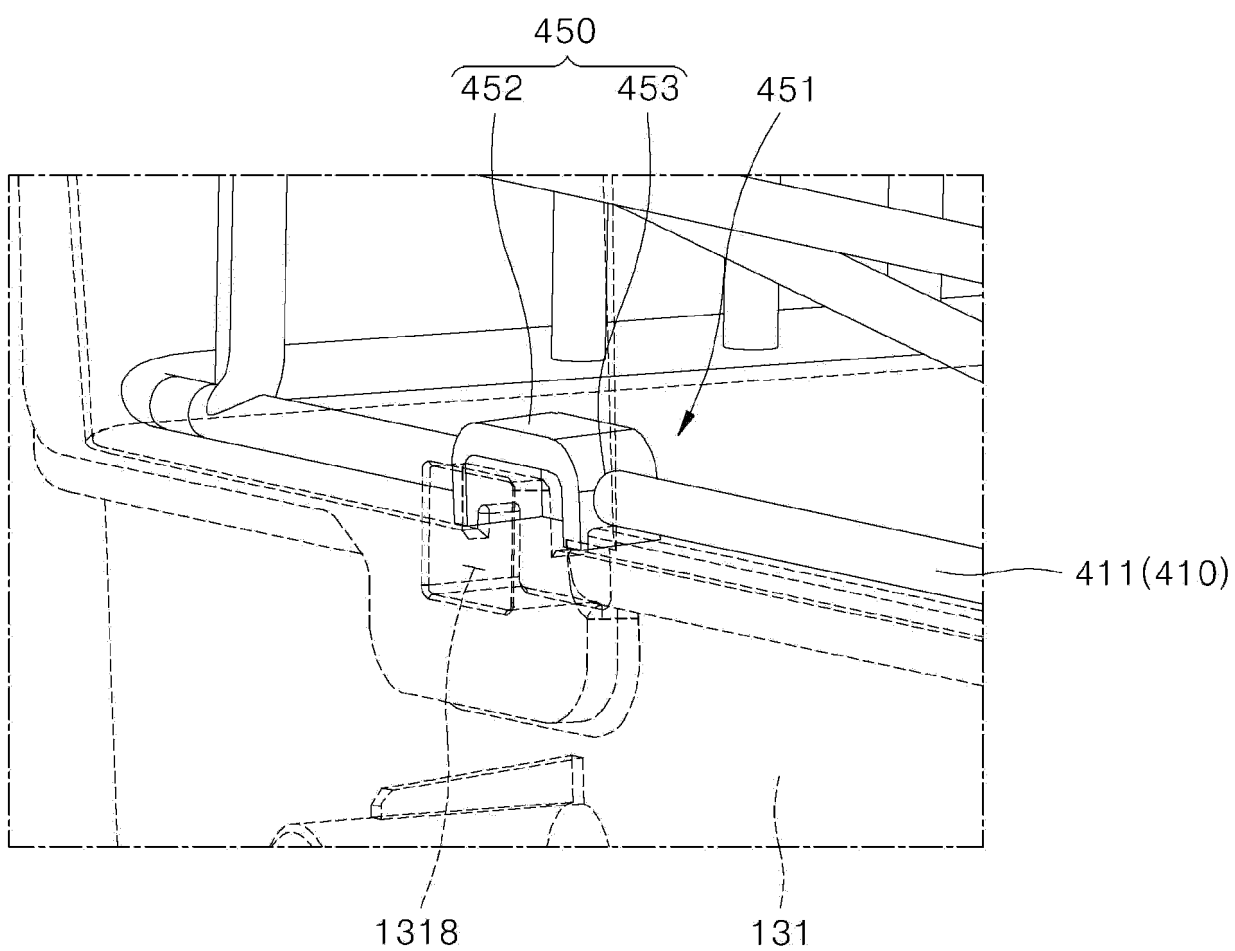
【FIG. 16】



【FIG. 17】



【FIG. 18】



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2023/013974

A. CLASSIFICATION OF SUBJECT MATTER

A47L 15/00(2006.01)i; A47L 15/50(2006.01)i; A47L 15/48(2006.01)i; A47L 15/42(2006.01)i; A47L 15/44(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)

A47L 15/00(2006.01); A47L 15/18(2006.01); A47L 15/30(2006.01); A47L 15/50(2006.01); A47L 17/10(2006.01);
A61L 2/18(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: 컵(cup), 보틀(bottle), 텀블러(tumbler), 머그(mug), 홀더(holder), 트레이(tray), 선반
(shelf), 랙(rack), 절곡(bend), 경사(incline), 가이드(guide), 콘(cone), 건조(dry)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2013-036468 A1 (PREMARK FEG L.L.C.) 14 March 2013 (2013-03-14) See pages 1 and 15-23 and figures 1-8.	1-5
A		6-15
A	KR 10-2114048 B1 (KIM, Yeon Jeong et al.) 25 May 2020 (2020-05-25) See paragraphs [0036]-[0055] and figures 3-6.	1-15
A	CN 216020886 U (FOSHAN JINSHI NEW MATERIAL TECHNOLOGY CO., LTD.) 15 March 2022 (2022-03-15) See paragraphs [0021] and [0023]-[0024] and figures 1-3.	1-15
A	JP 11-290261 A (SANYO ELECTRIC CO., LTD.) 26 October 1999 (1999-10-26) See paragraphs [0021]-[0025] and figures 1-2.	1-15

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

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“P” document published prior to the international filing date but later than the priority date claimed

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“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

04 January 2024

Date of mailing of the international search report

04 January 2024

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2023/013974

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 215650973 U (QINGDAO HAIER DISHWASHER CO., LTD. et al.) 28 January 2022 (2022-01-28) See paragraphs [0044]-[0050] and figures 1-2 and 5-6.	1-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2023/013974

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
WO	2013-036468	A1	14 March 2013	DE	102011082130	A1	07 March 2013
				EP	2753227	A1	16 July 2014
KR	10-2114048	B1	25 May 2020	None			
CN	216020886	U	15 March 2022	None			
JP	11-290261	A	26 October 1999	None			
CN	215650973	U	28 January 2022	None			

REFERENCES CITED IN THE DESCRIPTION

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- KR 1020140064119 [0006]