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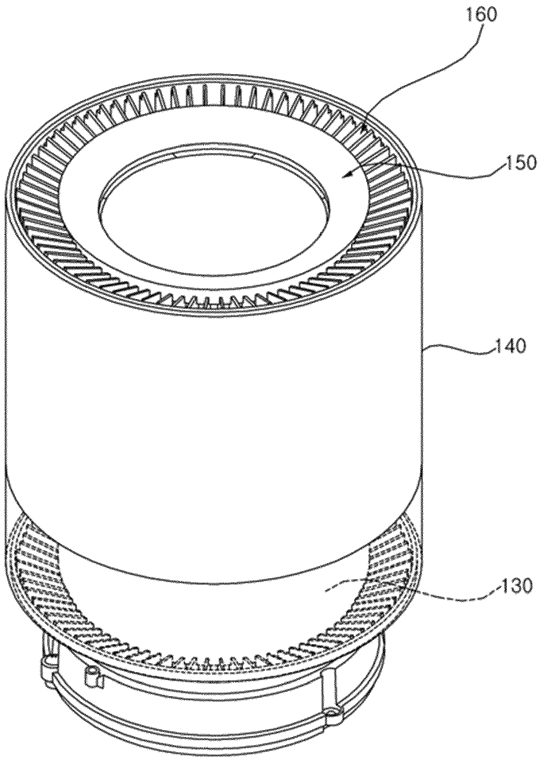
(54) **HUMIDIFIER**

(57) The present invention relates to a humidifier. The humidifier of the present invention includes a humidifying device which generates humidified air; a water tank which has a water storage space open to an upper side, and supplies water to the humidifying device; and a water tank cover which covers the open upper side of the water tank, wherein the water tank cover comprises a water supply hole located in an upper side of the water storage space so that the supplied water falls into the water storage space, wherein the water supply hole is formed along a circumference of an upper end of the water tank.

FIG. 7



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Description

[0001] This invention relates to a humidifier, and more particularly, to a humidifier capable of supplying water through an upper water supply structure.

[0002] A humidifier is a device that vaporizes water and emits humidified air with a high moisture content. A humidifier can generate humidified air by evaporating water through natural evaporation, heated evaporation, or ultrasonic vibration.

[0003] The 'humidifier' disclosed in Korea Patent No. 10-2346621 includes a case having a suction hole formed in the side surface and a discharge hole opened upward; a water tank installed inside the case; a disk assembly that supplies moisture to the air sucked through the suction hole while rotating; and a water supply assembly disposed in the upper side of the case, wherein the water supply assembly includes: a water supply case that is disposed in the upper side of the case, and has a water supply hole formed in a center; and a water supply guide that is located in the lower side of the water supply case, and guides the water flowing in through the water supply hole.

[0004] The conventional humidifier has a problem in that the water supply guide and the water tank are spaced apart in the vertical direction, and noise is generated as the water supplied to the water tank through the water supply guide falls.

[0005] In addition, there is a problem in that the supplied water is splashed around as it falls into the water tank. Thus, there is a risk that residual water may be generated inside the humidifier, thereby causing bacteria such as mold to grow.

[0006] In addition, due to a humidifier structure in which a disk assembly, a blower fan, a fan motor, and a water supply case are disposed in the upper side of the water tank, there is a problem in that it is inconvenient for a user to detach the humidifier after use and clean the water tank.

[0007] In addition, there is a problem in that a user cannot check the water level of the water tank during the water supply process. Due to this, if a user supplies excessive water, there is a problem in that the inside of the humidifier is flooded.

[0008] In addition, due to the complex structure of the water supply case, there is a problem in that it is difficult for a user to clean the path through which the supplied water flows. Due to this, there is a problem in that the supplied water becomes contaminated as it passes through a contaminated water supply path inside the water supply case.

SUMMARY

[0009] The present invention has been made in view of the above problems, and provides a humidifier with improved user convenience. The present invention is specified by the independent claims. Preferred embodiments are defined by the dependent claims.

[0010] The invention may further provide a humidifier with reduced noise during a water supply process.

[0011] The invention may further provide a humidifier with improved hygiene. The invention may further provide a humidifier that is easy to clean.

[0012] The invention may further provide a water supply structure with a simplified structure.

[0013] The invention may further provide a humidifier with a reduced risk of internal flooding.

[0014] The invention may further provide a humidifier that allows a user to check the water level in a water tank.

[0015] The invention may further provide a humidifier with improved durability.

[0016] In accordance with an aspect of the present invention, a humidifier includes: a humidifying device which generates humidified air; a water tank which has a water storage space open to an upper side, and supplies water to the humidifying device; and a water tank cover which covers the open upper side of the water tank, wherein the water tank cover includes a water supply hole located in an upper side of the water storage space so that the supplied water falls into the water storage space, wherein the water supply hole is formed along a circumference of an upper end of the water tank, so that the supplied water is guided to the inner wall of the water tank.

[0017] The water supply hole is located in an inner side in a horizontal direction than to the circumference of the upper end of the water tank, so that the supplied water may not overflow out of the water tank.

[0018] The water tank cover includes: a guide rim which is disposed in an upper side of the upper end of the water tan, and extends along the circumference of the upper end of the water tank; and a guide cover which is coupled to the guide rim, and covers the upper side of the water storage space.

[0019] The guide cover includes a guide plate which covers the upper side of the water storage space, and is inclined downward as it approaches the water supply hole, so that the guide plate can guide the supplied water to the water supply hole.

[0020] The guide cover includes a border wall which is spaced outwardly from an outer circumference of the guide plate, and coupled to the guide rim, so that the border wall can guide the supplied water to the water storage space.

[0021] The water supply hole is formed between the outer circumference of the guide plate and the border wall, so that the guide plate guides the supplied water to the water supply hole, and the border wall can prevent the water passing through the water supply hole from flowing out of the water tank.

[0022] The inner circumference of the guide rim may be spaced upward from the guide plate to form a space through which supplied water flows into the water supply hole.

[0023] The guide rim covers the upper side of the water supply hole, so that the water supply hole may not be

exposed to the outside.

[0024] The guide plate includes a guide rib which protrudes upward from an edge, and extends along the water supply hole, so that the supplied water may bypass the guide rib and flow into the water supply hole.

[0025] The guide cover is formed to be transparent, so that a user can visually check the water level inside the water tank through a transparent guide cover.

[0026] The guide plate includes a first guide slope inclined downward in a center direction of the guide plate, so that water splashed onto the guide rim during the water supply process may be guided to the water supply hole by the first guide slope.

[0027] The guide rim includes an inner peripheral wall extending downward from an inner circumference of the first guide slope, so that a space where excessively supplied water can be temporarily stored in the water tank cover may be formed.

[0028] The guide rim includes a fastening rib formed in a lower end of the inner peripheral wall, and the guide cover includes: a border wall which is spaced outwardly from an outer circumference of the guide plate, and coupled to the guide rim; and a fastening stopper formed in an upper end of the border wall, wherein the fastening rib is detachably coupled to the fastening stopper, so that the guide rim and the guide cover can be separated from or coupled with each other.

[0029] Since the border wall extends downward and is disposed in the opening of the upper side of the water tank, the border wall can guide the supplied water and prevent the supplied water from falling into a gap between the water tank cover and the water tank.

[0030] The humidifier further includes a case having an open upper side, and the humidifying device is disposed inside the case, the water tank is disposed in an upper side of the humidifying device inside the case, and a discharge flow path through which humidified air flows is formed between the case and the water tank, so that a user can easily attach and detach the water tank disposed in the upper portion.

[0031] The water tank cover includes: a guide rim which is disposed in an upper side of the upper end of the water tank, and extends along a circumference of the upper end of the water tank; and a guide cover which is coupled to the guide rim, and covers the upper side of the water storage space, wherein the guide rim includes a first guide slope inclined downward in center direction of the guide cover, wherein an outer circumference of the first guide slope is located in an outer side in a horizontal direction than to the upper end of the water tank.

[0032] The case includes: an outer shell spaced horizontally outward from the water tank; and an inner shell which is disposed inside the outer shell, and accommodates the water tank, wherein the discharge flow path includes: a first discharge flow path which is formed between the water tank and the inner shell, and through which humidified air flows; and a second discharge flow path which is formed between the inner shell and the outer shell, wherein the outer circumference of the first guide slope is located in an inner side in a horizontal direction than to an upper end of the inner shell, so that water splashed out of the water tank cover during the water supply process may flow into the humidifying device through the first discharge flow path.

[0033] The inner shell has a shell inlet through which humidified air discharged from the humidifier flows in, so that water flowing into the first discharge flow path may flow into the humidifying device through the shell inlet.

[0034] The humidifier further includes a water tank housing in which the water tank is accommodated; and a middle tray disposed between the humidifying device and the water tank housing, wherein the middle tray includes a load sensor that is located in the upper surface to detect a load, and the water tank housing pressurizes the load sensor, so that a user can check the level of water filled in the water tank by using the load sensor.

[0035] In accordance with another aspect of the present invention, a humidifier includes: a humidifying device which generates humidified air; a water tank which has a water storage space open to an upper side, and supplies water to the humidifying device; a water tank cover which covers the open upper side of the water tank; and a second guide slope which extends along a circumference of an upper end of the water tank, and is inclined downward in a center direction of the water tank, wherein the water tank cover includes a water supply hole located in an upper side of the water storage space so that the supplied water falls into the water storage space, wherein the second guide slope is located in a lower side of the water supply hole, so that the second guide slope can guide the supplied water to the inside of the water tank.

[0036] The humidifier further includes a water tank handle detachably coupled to the upper end of the water tank, wherein the water tank handle includes: a handle rim coupled to the upper end of the water tank; and the second guide slope extending inward from the handle rim, so that a user can hold the water tank handle and remove the water tank from the humidifier.

BRIEF DESCRIPTION OF THE DRAWINGS

[0037] The above and other objects, features and advantages of the present invention will be more apparent from the following detailed description in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a humidifier according to an embodiment of the present invention;

FIG. 2 is a schematic diagram of a humidifier according to an embodiment of the present invention;

FIG. 3 is a longitudinal cross-sectional view of a humidifier according to an embodiment of the present invention;

FIG. 4 is a longitudinal cross-sectional view of a blowing device according to an embodiment of the present invention;

FIG. 5 is a diagram showing a humidifying device and a flow path unit according to an embodiment of the present invention;
FIG. 6 is a longitudinal cross-sectional view of a humidifying device according to an embodiment of the present invention;
FIG. 7 is a perspective view of a flow path unit according to an embodiment of the present invention;
FIG. 8 is an exploded view of a coupling of flow path unit according to an embodiment of the present invention;
FIG. 9 is a perspective view of a water tank cover according to an embodiment of the present invention;
FIG. 10 is a plan view of a water tank cover according to an embodiment of the present invention;
FIG. 11 is a cross-sectional perspective view of a guide rim according to an embodiment of the present invention;
FIG. 12 is a bottom view of a guide rim according to an embodiment of the present invention;
FIG. 13 is a perspective view of a guide cover according to an embodiment of the present invention;
FIG. 14 is an enlarged view of a guide cover according to an embodiment of the present invention;
FIG. 15 is a perspective view of a water tank according to an embodiment of the present invention;
FIG. 16 is an exploded view of a coupling of a water tank housing, an inner shell, and a middle tray according to an embodiment of the present invention;
FIG. 17 is a cross-sectional perspective view of a flow path unit according to an embodiment of the present invention;
FIG. 18 is a longitudinal cross-sectional view of a flow path unit according to an embodiment of the present invention;
FIG. 19 is a cross-sectional perspective view of a portion of a flow path unit according to an embodiment of the present invention;
FIG. 20 is a cross-sectional view of a portion of a flow path unit according to an embodiment of the present invention;
FIG. 21 is an enlarged view of S1 in FIG. 20;
FIG. 22 is a perspective view of a water tank and a water tank handle according to an embodiment of the present invention;
FIG. 23 is a plan view of a water tank coupled with a water tank handle according to an embodiment of the present invention;
FIG. 24 is a longitudinal cross-sectional view of a flow path unit coupled with a water tank handle according to an embodiment of the present invention;
FIG. 25 is an enlarged view of S2 in FIG. 24;
FIG. 26 is an exploded view of a coupling of a flow path unit according to an embodiment of the present invention;
FIG. 27 is a cross-sectional perspective view of a humidifier according to an embodiment of the present invention;
FIG. 28 is a perspective view of a middle tray according to an embodiment of the present invention;
FIG. 29 is a cross-sectional perspective view of a middle tray according to an embodiment of the present invention; and
FIG. 30 is a longitudinal cross-sectional view of a middle tray according to an embodiment of the present invention.

DETAILED DESCRIPTION

[0038] Description will now be given in detail according to exemplary embodiments disclosed herein, with reference to the accompanying drawings. For the sake of brief description with reference to the drawings, the same or equivalent components may be denoted by the same reference numbers, and description thereof will not be repeated.

[0039] In general, suffixes such as "module" and "unit" may be used to refer to elements or components. Use of such suffixes herein is merely intended to facilitate description of the specification, and the suffixes do not have any special meaning or function.

[0040] In the present invention, that which is well known to one of ordinary skill in the relevant art has generally been omitted for the sake of brevity. The accompanying drawings are used to assist in easy understanding of various technical features and it should be understood that the embodiments presented herein are not limited by the accompanying drawings. As such, the present invention should be construed to extend to any alterations, and substitutes in addition to those which are particularly set out in the accompanying drawings.

[0041] It will be understood that although the terms first, second, etc. may be used herein to describe various elements, these elements should not be limited by these terms. These terms are only used to distinguish one element from another.

[0042] It will be understood that when an element is referred to as being "connected with" another element, there may be intervening elements present. In contrast, it will be understood that when an element is referred to as being "directly connected with" another element, there are no intervening elements present.

[0043] A singular representation may include a plural representation unless context clearly indicates otherwise.

[0044] In the present application, it should be understood that the terms "comprises, includes," "has," etc. specify the presence of features, numbers, steps, operations, elements, components, or combinations thereof described in the specification, but do not preclude the presence or addition of one or more other features, numbers, steps, operations, elements, components, or combinations thereof.

[0045] The direction indications of up(U), down(D), left(Le), right(Ri), front(F), rear(R), and outside(O) shown

in the drawing are only for convenience of explanation, and the technical concept disclosed in this specification is not limited thereto.

[0046] Referring to FIG. 1, a humidifier 1 may include a case 10, a stand 16, a discharge grill 160, and a water tank cover 150.

[0047] The case 10 may define an outer shape of the humidifier 1. The case 10 may extend long in the up-down direction. For example, the case 10 may have a cylindrical shape extending long in the up-down direction. The case 10 may include an internal space. A humidifying device 200, which will be described later, may be disposed in the internal space of the case 10.

[0048] The case 10 may include a suction hole (not shown) . The suction hole may be a through hole formed in the case 10. The suction hole may be formed in a side surface of the case 10. The suction hole may be formed in a circumferential surface of the case 10. For example, the suction hole may be a through hole formed in a circumferential surface of the case 10. The case 10 may include a discharge hole (no reference numeral). The humidified air may be supplied to the indoor space through a discharge hole of the case 10. The discharge hole may be formed in the upper side of the case 10. The upper side of the case 10 may be open. The discharge hole may be an opening formed in the upper side of the case 10. For example, the discharge hole may be an annular discharge hole opened at the upper surface of the cylindrical case 10. The indoor air flowed in through the suction hole may be discharged through the discharge hole together with humidified air.

[0049] The humidifier 1 may include a stand 16 that supports the case 10. The stand 16 may be disposed in the lower side of the case 10. The stand 16 may be fixed to the case 10. The stand 16 is able to prevent the case 10 from falling. A diameter of the stand 16 may be larger than a diameter of the case 10. The outer circumference of the stand 16 may be located outside relative to the peripheral wall of the case 10 in the horizontal direction.

[0050] The discharge grill 160 may be disposed in the discharge hole. The discharge grill 160 may be disposed in the open upper side of the case 10. The discharge grill 160 may be disposed in the discharge hole. The discharge grill 160 may form the upper surface of the case 10. Humidified air may pass through the discharge grill 160 and be supplied to the indoor space.

[0051] The water tank cover 150 may be disposed on the open upper side of the case 10. The water tank cover 150 may be disposed at the center of the discharge grill 160. The discharge grill 160 may be disposed in the outside of the water tank cover 150. The water tank cover 150 may cover the water tank 110 described later. The water tank cover 150 may be a lid of the water tank 110. The water tank cover 150 may be removably attached to the discharge grill 160. For example, a user may supply water to the water tank 110 by separating the water tank cover 150 from the discharge grill. After supplying water, a user may couple the water tank cover 150 to the discharge grill 160.

[0052] Referring to FIG. 2, the humidifier 1 may include a case 10, a water tank 110, a humidifying device 200, and a blowing fan 350.

[0053] The indoor air may flowed in through a suction hole 310 formed in the case 10 (Fi). The suction hole 310 may be formed in the lower portion of the case 10. The air flowed into the inside of the case 10 may flow through the flow path defined therein (Fi). The air flowing inside the case 10 may be discharged back to the indoor space through a discharge hole 1600 defined in the upper side (Fi). Therefore, the humidity of the discharged air may be higher than the humidity of the sucked air.

[0054] The water tank 110 may store water. The water tank 110 may include a water storage space 1100 in which water is stored. The water stored in the water storage space 1100 may be supplied to the humidifying device 200 (Fs1). The humidifying device 200 can generate humidified air using supplied water.

[0055] The humidifying device 200 may generate humidified air. Humidified air may include haze and/or water vapor. That is, humidified air may refer to air including haze and/or water vapor. The humidity of humidified air may be higher than the humidity of indoor air.

[0056] The humidifying device 200 may include a heating water tank 230. Water supplied from the water tank 110 may flow into the heating water tank 230 (Fs1). The heating water tank 230 may heat the water supplied from the water tank 110. The heating water tank 230 may sterilize the supplied water by heating it.

[0057] The humidifying device 200 may include a humidifying water tank 260. The water sterilized in the heating water tank 230 may move to the humidifying water tank 260 (Fs1). The humidifying water tank 260 may utilize water supplied from the heating water tank 230 to generate humidified air. The humidifying water tank 260 may generate humidified air by using any one of an ultrasonic method, a heating method, an evaporation method, and a disk method. For example, the humidifying water tank 260 may generate humidified air by atomizing the supplied water by using an ultrasonic vibrator.

[0058] The blowing fan 350 may be disposed inside the case 10. The blowing fan 350 may be disposed in the lower portion of the humidifying device 200. The blowing fan 350 may form an air current that flows inside the case. The blowing fan 350 may form an airflow flowing from the suction hole 310 to the discharge hole 1600 (Fi).

[0059] For example, the blowing fan 350 may form a rising airflow that flows from the suction hole 310 formed in the lower portion of the case 10 to the discharge hole 1600 formed in the upper surface of the case 10.

[0060] The case 10 may include a blowing flow path 390. The blowing flow path 390 may be formed inside the case 10. The blowing flow path 390 may be a flow path through which air blowing from the blowing fan 350 flows. The air flowed in through the suction hole 310 may flow to the blowing fan 350 through the suction flow path 330 (Fi). The air passed through the blowing fan 350 may

flow into the blowing flow path 390 (Fi).

[0061] The case 10 may include a discharge flow path 1000. The discharge flow path 1000 may be formed inside the case 10. The air passed through the blowing flow path 390 may flow to the discharge flow path 1000 (Fd). The discharge flow path 1000 may be located in the upper side of the blowing flow path 390. The discharge flow path 1000 may be located in the downstream side of the blowing flow path 390.

[0062] The discharge flow path 1000 may include a first discharge flow path 1000a and a second discharge flow path 1000b. The discharge hole 1600 may include a first discharge hole 1600a corresponding to the first discharge flow path 1000a, and a second discharge hole 1600b corresponding to the second discharge flow path 1000b. The second discharge flow path 1000b may be formed inside the case 10. The first discharge flow path 1000a may be formed inside the second discharge flow path 1000b. The second discharge flow path 1000b may be connected to the blowing flow path 390. The second discharge flow path 1000b may be located in the downstream side of the blowing flow path 390. Some of the air passed through the blowing flow path 390 may rise through the second discharge flow path 1000b (Fd2). The air that passed through the second discharge flow path 1000b may be supplied to the indoor space through the second discharge hole 1600b (Fd2). Some remaining portion of the air that passed through the blowing flow path 390 may flow into the humidifying device 200 (Fs2). Some remaining portion of the air passed through the blowing flow path 390 may flow into the humidifying water tank 260 (Fs2) . Some remaining portion of the air flowing into the humidifying water tank 260 may flow into the first discharge flow path 1000a along with the humidified air generated in the humidifying water tank 260 (Fdl). Humidified air flowing through the first discharge flow path 1000a may be supplied to the indoor space through the first discharge hole 1600a (Fdl).

[0063] Referring to FIG. 3, the humidifier 1 may include a blower 300, a humidifying device 200, a flow path unit 100, a display 500, and an electrical equipment unit 380.

[0064] The blower 300 may form an airflow. The blower 300 may be disposed inside the case 10. The blower 300 may form an airflow flowing inside the case 10. The blower 300 may flow indoor air into the case 10 through the suction hole 310. The blower 300 may blow the sucked air to the humidifying device 200 and/or the flow path unit 100. The blower 300 may form an airflow that pulls the humidified air generated by the humidifying device 200. The blower 300 may provide power to discharge humidified air generated by the humidifying device 200 to the indoor space.

[0065] The humidifying device 200 may generate humidified air. The humidifying device 200 may be disposed inside the case 10. The humidifying device 200 may be disposed in the upper side of the blower 300. The humidifying device 200 may discharge humidified air. The rising airflow formed from the blower 300 may be directed to the humidifying device 200 through the blowing flow path 390. The rising airflow may pull the humidified air generated by the humidifying device 200 upward. The humidified air may be discharged through the discharge hole 1600 along with an upward airflow.

[0066] A flow path unit 100 may include a flow path through which air is discharged. The flow path unit 100 may include a discharge flow path 1000. The discharge flow path 1000 may include a first discharge flow path 1000a and a second discharge flow path 1000b. Humidified air generated by the humidifying device 200 may flow to the first discharge hole 1600a through the first discharge flow path 1000a. Humidified air may be supplied to the indoor space through the first discharge hole 1600a. A portion of the air flowing in the blowing flow path 390 may flow to the second discharge hole 1600b through the second discharge flow path 1000b. The portion of air is supplied to the indoor space through the second discharge hole 1600b.

[0067] The display 500 may display information on the humidifier 1. The display 500 may include an output unit that displays information on the humidifier 1 to a user. Information on the humidifier 1 may include information such as the level of water stored in the water tank 110, the amount of humidification discharged, the temperature and humidity of the indoor space, the quality of air in the indoor space, the concentration of fine dust in the indoor space, and the like. The display 500 may include an input unit through which a user's command is input. A user may control the operation of the humidifier 1 through the display 500. For example, a user may control the humidification amount, air volume, operation time, turn on-off of lighting, the intensity of lighting, etc through the display 500.

[0068] The electrical equipment unit 380 may transmit and receive electrical signals. The electrical equipment unit 380 may control the operation of the humidifier 1. The electrical equipment unit 380 may control the power supplied to the humidifier 1.

[0069] Referring to FIG. 4, the blower 300 may include a filter 320, a blowing fan 350, and a blower motor.

[0070] The indoor air may be sucked into the blower 300 through the suction hole 310 formed in the case 10. The blower 300 may include a filter 320 that filters the sucked air. The filter 320 may be disposed inside the case 10. For example, the filter 320 may be disposed inside the cylindrical case 10, and may be formed in a cylindrical shape. The air passed through the filter 320 may flow to the blowing fan 350 through the suction flow path 330. The suction flow path 330 may be formed inside the filter 320.

[0071] The blower 300 may include an orifice 340 located between the blowing fan 350 and the filter 320. The orifice 340 may be a hole through which the sucked air passes. The orifice 340 may be located between the suction flow path 330 and the blowing flow path 390. The orifice 340 may communicate with the suction flow path 330 and the blowing flow path 390. The orifice 340 may

correspond to an inlet (no reference numeral) formed in the blowing fan 350. That is, the orifice 340 may correspond to the inlet formed in a shroud of the blowing fan 350. The sucked air may flow from the suction flow path 330 to the blowing fan 350 through the orifice 340, and may flow to the blowing flow path 390 by rotation of the blowing fan 350.

[0072] The blower 300 may include a blower motor 352 that rotates the blowing fan 350. The blower motor 352 may be connected to the blowing fan 350. For example, the shaft 354 of the blower motor 352 may be connected to the blowing fan 350. The blower motor 352 may be disposed in the upper side of the blowing fan 350. The shaft 354 may extend downward from the blower motor 352, and may be connected to a hub of the blowing fan 350. As the blower motor 352 is driven, the blowing fan 350 rotates to form an airflow.

[0073] The blower 300 may include a motor cover 360 in which the blower motor 352 is disposed. The blower motor 352 may be accommodated in the motor cover 360. Inside the motor cover 360, the blower motor 352 may be disposed, and the blowing fan 350 may be disposed outside the motor cover 360. For example, the blowing fan 350 may be disposed in the lower side of the motor cover 360. The shaft 354 of the blower motor 352 may penetrate the motor cover 360.

[0074] The blower 300 may include a blower housing 370 that forms a blowing flow path 390. The blower housing 370 may be disposed inside the case 10. The blowing fan 350 and the blower motor 352 may be disposed inside the blower housing 370. The blowing flow path 390 may be formed between the motor cover 360 and the blower housing 370. The blower housing 370 may extend in the up-down direction.

[0075] The case 10 may include an inner case 14 and an outer case 12. The outer case 12 may define the outer shape of the case 10. The outer case 12 may include a plurality of louvers 12a. The plurality of louvers 12a may be disposed along the circumference of the outer case 12. The inner case 14 may be disposed inside the outer case 12. The inner case 14 may be disposed in the upper side of the blower housing 370. For example, the inner case 14 and the blower housing 370 are disposed inside the outer case 12, and the inner case 14 may be coupled to the upper side of the blower housing 370.

[0076] The blowing flow path 390 may be defined inside the case 10. The blowing flow path 390 may extend in the up-down direction inside the case 10. The blowing flow path 390 may have an annular cross-section. The blowing flow path 390 may be located in the downstream side of the blowing fan 350. The blowing fan 350 may be located between the suction flow path 330 and the blowing flow path 390. The motor cover 360 may be disposed inside the blower housing 370. The blowing flow path 390 may be formed between the motor cover 360 and the blower housing 370.

[0077] The electrical equipment unit 380 may be disposed in the upper side of the blower motor 352. The electrical equipment unit 380 may be disposed inside the inner case 14. A blowing flow path 390 may be formed between the electrical equipment unit 380 and the inner case 14. Accordingly, the sucked air may be directed to the humidifying device 200 along the blowing flow path 390 by the blowing fan 350.

[0078] The blower 300 may include an air diffuser 372 disposed in the blowing flow path 390. The air diffuser 372 may control the directionality of the airflow flowing in the blowing flow path 390. For example, the air diffuser 372 may straighten the airflow flowing through the blowing flow path 390. The air diffuser 372 may be disposed in the outside of the motor cover 360. The air diffuser 372 may be disposed inside the blower housing 370. For example, the air diffuser 372 is a plurality of air diffusers 372 disposed between the motor cover 360 and the blower housing 370, and the plurality of air diffusers 372 may be disposed to be spaced apart from each other in the circumferential direction of the cross section of the blowing flow path 390. A flow path may be formed between the plurality of air diffusers 372.

[0079] Referring to FIG. 4, the blower 300 may include an electrical equipment unit 380.

[0080] The electrical equipment unit 380 may include a controller 388 that controls the operation of the humidifier 1. The controller 388 may control the turn on-off, operation time, humidification amount, turn on-off and intensity of lighting, etc. For example, the controller 388 may be a microcontroller (MCU) .

[0081] The electrical equipment unit 380 may include a power supply device 384 that receives external power and supplies electrical energy to the humidifier 1. The power supply device 384 may supply electrical energy to the humidifying device 200, the blower 300, and the display 500. The power supply device 384 may include a rectifier.

[0082] The electrical equipment unit may include a phase control device 386. The phase control device 386 may convert the voltage and current input to the humidifying device 200. For example, the phase control device 386 may convert the power input to the heater 250 of the water tank 230.

[0083] The electrical equipment unit 380 may include a communication device (not shown) that transmits and receives data. The communication device may include a wireless communication device. The communication device may use wireless communication technologies such as Wi-Fi, Bluetooth, and cellular. The communication device may transmit and receive data to other devices.

[0084] The electrical equipment unit 380 may include a sensor (not shown) that detects information on the indoor space. For example, the sensor may include a temperature sensor that detects the temperature of the indoor space and a humidity sensor that detects the humidity of the indoor space.

[0085] Referring to FIG. 5, humidified air discharged from the humidifying device 200 may be discharged through the flow path unit 100.

[0086] The humidifying device 200 may include a main housing 2000, a supply pipe 210, and a humid air outlet 2742. The main housing 2000 may define the outer shape of the humidifying device 200.

[0087] Water stored in a water storage space 1100 may flow into the humidifying device 200 through the supply pipe 210. The humidifying device 200 may generate humidified air by using water supplied through the supply pipe 210. The supply pipe 210 may be disposed in the upper side of the humidifying device 200. The supply pipe 210 may extend upward. For example, water stored in the water storage space 1100 located in the upper side of the humidifying device 200 may flow in through the supply pipe 210 located in the upper side of the humidifying device 200.

[0088] Humidified air generated in the humidifying device 200 may be discharged through the humid air outlet 2742. The humid air outlet 2742 may be defined at the upper side of the humidifying device 200. The humid air outlet 2742 may be opened at the upper surface of the humidifying device 200.

[0089] The middle tray 400 may be disposed above the humidifying device 200. The middle tray 400 may be coupled to the upper surface of the humidifying device 200. The middle tray 400 may be disposed between the humidifying device 200 and the flow path unit 100.

[0090] The display 500 may be disposed in one side of the humidifying device 200. The display 500 may be coupled to one side of a main housing 2000. The display 500 may be coupled to one side of the middle tray 400. For example, the middle tray 400 may be disposed in the upper side of the humidifying device 200, and the display 500 may be disposed in the side surface of the humidifying device 200.

[0091] The flow path unit 100 may include a water storage space 1100, a discharge flow path 1000, and a discharge hole 1600.

[0092] The water storage space 1100 may be defined inside the flow path unit 100. The water stored in the water storage space 1100 may be supplied to the humidifying device 200. For example, the water stored in the water storage space 1100 may flow into the humidifying device 200 through the supply pipe 210 located in the lower side.

[0093] The discharge flow path 1000 may be located inside the flow path unit 100. The discharge flow path 1000 may be located outside the water storage space 1100. The discharge flow path 1000 may be located between the peripheral wall of the flow path unit 100 and the water storage space 1100. The discharge flow path 1000 may include a first discharge flow path 1000a located in the outside of the water storage space 1100, and a second discharge flow path 1000b located in the outside of the first discharge flow path 1000a. The first discharge flow path 1000a may be located between the water storage space 1100 and the second discharge flow path 1000b. The second discharge flow path 1000b may be located between the first discharge flow path 1000a and the peripheral wall of the flow path unit 100.

[0094] Humidified air discharged from the humidifying device 200 may flow through the discharge flow path 1000. For example, the humidified air discharged from the humid air outlet 2742 may flow through the first discharge flow path 1000a. Humidified air flowing through the first discharge flow path 1000a may be supplied to the indoor space through the discharge hole 1600. The first discharge flow path 1000a and the second discharge flow path 1000b are joined at the discharge hole 1600. The first discharge flow path 1000a may be connected to the humid air outlet 2742. The second discharge flow path 1000b may be connected to the blowing flow path 390.

[0095] Referring to FIG. 6, the humidifying device 200 may include a main housing 2000, a supply pipe 210, a first valve 212, a heating water tank 230, a first connection pipe 240, a drain pipe 290, a humidifying water tank 260, and a compartment cover 270.

[0096] The main housing 2000 may be disposed inside the case 10. The main housing 2000 may accommodate a heating water tank 230 and a humidifying water tank 260 which will be described later. The upper side of the main housing 2000 may be opened.

[0097] The supply pipe 210 may be a pipe through which water is supplied to the humidifying device 200. The supply pipe 210 may be connected to the humidifying device 200. The water stored in the water tank 110 may be supplied to the humidifying device through the supply pipe 210. 200. For example, water stored in the water tank 110 may be moved to the heating water tank 230 through the supply pipe 210. A supply chamber 2100 may be formed inside the supply pipe 210. The water flowing into the supply pipe 210 may pass through the supply chamber 2100 and flow into the heating water tank. The water flowing into the supply pipe 210 may be temporarily stored in the supply chamber 2100.

[0098] The first valve 212 may control the flow of water supplied to the humidifying device 200 through the supply pipe 210. For example, when the first valve 212 is opened, the water stored in the supply chamber 2100 may be moved to the heating water tank 230. Conversely, when the first valve 212 is closed, the supplied water may be temporarily stored in the supply chamber 2100. The first valve 212 may be opened and closed according to an electrical signal of the electrical equipment unit 380. The first valve 212 may be supplied with power from the electrical equipment unit 380. For example, the first valve 212 may be a solenoid valve. The first valve 212 may be disposed in the upper side of the heating water tank 230. The first valve 212 may be disposed in the supply pipe 210. For example, the first valve 212 may be disposed between the heating water tank 230 and the supply pipe 210. The first valve 212 may be spaced upward from the heating water tank 230. For example, the first valve 212 may be spaced upward from the upper surface of the heating water tank 230.

[0099] The heating water tank 230 may be disposed

inside the main housing 2000. The heating water tank 230 may heat water flowed in through the supply pipe 210. The heating water tank 230 may heat the water to sterilize it. The water heated in the heating water tank 230 may flow into the humidifying water tank 260.

[0100] The first connection pipe 240 may be a pipe through which water stored in the heating water tank 230 flows to the humidifying water tank 260. The height of the first connection pipe 240 may decrease as it progresses downstream. The first connection pipe 240 may be inclined downward toward the downstream side. The first connection pipe 240 may have high thermal conductivity. The temperature of water heated in the heating water tank 230 may decrease while flowing through the first connection pipe 240.

[0101] The drain pipe 290 may be connected to the heating water tank 230. The drain pipe 290 may discharge residual water stored in the heating water tank 230. The remaining water may be discharged to the outside of the case 10 through the drain pipe 290. The drain pipe 290 may be connected to the lower portion of the heating tank 230. For example, the drain pipe 290 may be connected to the bottom surface of the heating tank 230.

[0102] The humidifying water tank 260 may generate humidified air by using supplied water. Humidified air may refer to air containing haze and/or water vapor. The humidifying water tank 260 may generate humidified air by using any one of an ultrasonic method, a heating method, an evaporation method, and a disk method. For example, the humidifying water tank 260 may generate humidified air by atomizing supplied water using an ultrasonic vibrator. The humidifying water tank may be equipped with a vibration device 262.

[0103] The vibration device 262 may be disposed in the bottom surface of the humidifying water tank 260. The vibration device 262 may split the supplied water into fine particles by using ultrasonic vibration. The vibration device 262 may atomize supplied water electrically. For example, the vibration device 262 may include a piezoelectric element.

[0104] The compartment cover 270 may be disposed in the upper side of the main housing 2000. The compartment cover 270 may cover the upper side of the humidifying water tank 260. The compartment cover 270 may partition a flow path flowing into the humidifying water tank 260 and a flow path flowing out from the humidifying water tank 260. For example, the compartment cover 270 may include an air supply pipe 210 which is a flow path through which a portion of the rising airflow flowing through the blowing flow path 390 flows into the humidifying water tank 260, and a discharge pipe 274 through which a portion of the rising airflow flowing into the humidifying water tank 260 and the haze stagnant in the humidifying water tank 260 are discharged together. The air supply pipe 210 may connect the blowing flow path 390 and the humidifying water tank 260. The rising airflow that flows into the humidifying water tank 260 through the blowing flow path 390 may flow by pulling the haze generated in the humidifying water tank 260. Through this, the haze generated in the humidifying water tank 260 may be discharged. The discharge pipe 274 may extend in an up-down direction. The discharge pipe 274 may form a discharge flow path 2740. The humid air outlet 2742 may be formed at one end of the discharge pipe 274. The discharge pipe 274 may be inserted into the humidifying water tank 260.

[0105] The humidifying device 200 may include a communication flow path 280 that connects the heating water tank 230 and the humidifying water tank 260. The communication flow path 280 may connect the upper portion of the heating water tank 230 and the upper portion of the humidifying water tank 260. In the heating water tank 230, water vapor may be generated in the process of heating the supplied water. The generated water vapor may flow into the humidifying water tank 260 through the communication flow path 280. The discharge pipe 274 may be open toward the communication flow path 280. The communication flow path 280 may be connected to the discharge flow path 2740. Water vapor that moves from the heating water tank 230 to the humidifying water tank 260 through the communication flow path 280 may be discharged through the discharge pipe 274. Through this, the humidified air may include water vapor generated in the heating water tank 230, haze generated in the humidifying water tank 260, and a rising airflow formed by the blowing fan 350.

[0106] Referring to FIG. 6, the humidifier 1 may include a display 500.

[0107] The display 500 may be disposed in one side of the humidifying device 200. The display 500 may be coupled to one side of the main housing 2000. For example, the display 500 may be coupled to the side surface of the humidifying device 200. The display 500 may be spaced apart from the humidifying water tank 260 in the horizontal direction. The display 500 may be spaced apart in the horizontal direction from the discharge pipe 274 through which humidified air generated in the humidifying water tank 260 is discharged. The supply pipe 210 may be disposed between the display 500 and the discharge pipe 274. For example, the display 500 and the discharge pipe 274 may be disposed in opposite sides in the horizontal direction based on the central axis CX of the case 10. That is, based on the central axis CX of the case 10, the display 500 may be disposed in the front surface of the case, and the humid air outlet 2742 may be disposed in the rear.

[0108] Referring to FIG. 7, the flow path unit 100 may include a shell 130, 140, a discharge grill 160, and a water tank cover 150.

[0109] The flow path unit 100 may include the shell 130, 140. The case 10 may include the shell 130, 140. The shell 130, 140 may form the outer shape of the flow path unit 100. The shell 130, 140 may have an accommodating space formed therein. The water tank 110 may be accommodated in the shell 130, 140. A discharge flow

path 1000 may be formed inside the shell 130, 140. The upper side of the shell 130, 140 may be open. A discharge hole 1600 may be formed in the upper side of the shell 130, 140.

[0110] The discharge grill 160 may be disposed above the shell 130, 140. The discharge grill 160 may be disposed at the discharge hole 1600. The discharge grill 160 may be disposed on the upper end of the shell 130, 140. For example, the discharge grille 160 may extend along the inner circumference of the upper end of the shell 130, 140. The discharge grille 160 may include a plurality of vanes.

[0111] The water tank cover 150 may be disposed in the upper side of the shell 130, 140. The water tank cover 150 may cover the open upper side of the water tank 110. The water tank cover 150 may open or close the water tank 110. The water tank cover 150 may be disposed inside the discharge grill 160. The water tank cover 150 may be disposed at the center of the annular discharge grill 160. For example, the water tank 110 may be disposed at the center of the shell 130, 140, and the water tank cover 150 may cover the open upper side of the water tank 110.

[0112] Referring to FIG. 8 and FIG. 15, the flow path unit 100 may include a water tank 110, a water tank cover 150, a water tank housing 120, an inner shell 130, an outer shell 140, and a discharge grill 160.

[0113] The water tank 110 may be formed in a cylindrical shape. The water tank 110 may extend in the up-down direction. A water storage space 1100 may be formed inside the water tank 110. The discharge grill 160 may extend along the circumference of the upper end of the water tank 110. The discharge grill 160 may be disposed in the outside of the upper end of the water tank 110. The water tank 110 may include a water tank peripheral wall 112 that forms the outer shape. The water tank peripheral wall 112 may partition the water storage space 1100 of the water tank 110.

[0114] The water tank housing 120 may accommodate the water tank 110. The water tank housing 120 may form an internal space in which the water tank 110 is disposed. The water tank housing 120 may surround the water tank 110. The water tank housing 120 may be a holder of the water tank 110. The water tank housing 120 may cover the water tank peripheral wall 112 of the water tank 110. The water tank 110 may be fitted to the water tank housing 120. The water tank peripheral wall 112 may be in close contact with the inner peripheral wall of the water tank housing 120. The water tank housing 120 may fix the inserted water tank 110 to prevent movement in the horizontal direction. The water tank housing 120 may keep the water tank 110 horizontally to prevent tipping over inside the case 10. The water tank housing 120 and the water tank 110 may be separated from the case 10 respectively. The water tank housing 120 may include a housing peripheral wall 122 that partitions the internal space.

[0115] The shell 130, 140 may include the inner shell 130. The case 10 may include the inner shell 130. The inner shell 130 may accommodate the water tank 110 and/or the water tank housing 120. The inner shell 130 may be spaced outwardly from the water tank 110 and/or the water tank housing 120. The first discharge flow path 1000a may be formed between the inner shell 130 and the water tank housing 120. The first discharge flow path 1000a may be formed between the water tank 110 and the inner shell 130. The second discharge flow path 1000b may be formed between the inner shell 130 and the case 10. Humidified air generated in the humidifying device 200 may flow through the first discharge flow path 1000a. The inner shell 130 may partition the first discharge flow path 1000a and the second discharge flow path 1000b. The inner shell 130 may include an inner peripheral wall 132 that partitions the internal space.

[0116] The shell 130, 140 may include an outer shell 140. The case 10 may include an outer shell 140. The outer shell 140 may form the outer shape of the flow path unit 100. The outer shell 140 may have an internal space. The outer shell 140 may have an open upper side. The outer shell 140 may accommodate the water tank 110, the water tank housing 120, and/or the inner shell 130. The outer shell 140 may be spaced outwardly from the water tank 110, the water tank housing 120, and/or the inner shell 130. The discharge flow path 1000 may be formed inside the shell 140. The discharge flow path 1000 may be formed between the outer shell 140 and the water tank 110. For example, the first discharge flow path 1000a may be formed between the water tank housing 120 and the inner shell 130, and the second discharge flow path 1000b may be formed between the inner shell 130 and the outer shell 140. The outer shell 140 may include an outer peripheral wall 142 that divides the internal space.

[0117] Referring to FIGS. 9 and 10, the water tank cover 150 may include a guide rim 154 and a guide cover 152.

[0118] The guide rim 154 may form the circumference of the water tank cover 150. That is, the guide rim 154 may form the edge of the water tank cover 150. The guide rim 154 may be formed in an annular shape with an open center.

[0119] The guide cover 152 may be disposed inside the guide rim 154. The guide cover 152 may be disposed in the center of the guide rim 154. For example, the guide cover 152 may be disposed in the open center of the guide rim 154. The guide cover 152 may be formed in a circular shape. For example, the guide cover 152 may have a circular plate shape.

[0120] A water supply hole 1500 may be formed between the guide rim 154 and the guide cover 152. For example, the water supply hole 1500 may be formed between the inner circumference of the guide rim 154 and the outer circumference of the guide cover 152.

[0121] Referring to FIG. 11, the guide rim 154 may include a first guide slope 1542, an inner peripheral wall 1544, and a support peripheral wall 1548.

[0122] The first guide slope 1542 may be defined on

one surface of the guide rim 154. The first guide slope 1542 may extend downward in a center direction. For example, the guide rim 154 may include a first guide slope 1542 whose upper surface is inclined downward in a center direction. The center direction may be a center direction of the guide rim 154. That is, the center direction may be a direction toward the virtual center of the guide rim 154 defined in an annular shape. The center direction of the guide rim 154 may be a direction toward the central axis CX of the water tank 110.

[0123] The guide rim 154 may include an inner peripheral wall 1544 extending downward from the inner end of the first guide slope 1542. The inner peripheral wall 1544 may extend along the circumferential direction of the guide rim 154. The inner peripheral wall 1544 may be formed in an annular shape. The inner peripheral wall 1544 may form a space where supplied water may be temporarily accommodated. For example, the inner peripheral wall 1544 may partition a space located in the upper side of the guide cover 152. The first guide slope 1542 may extend from the inner peripheral wall 1544 in an outward direction. For example, the first guide slope 1542 may extend radially upward from the upper end of the inner peripheral wall 1544.

[0124] The guide rim 154 may include a support peripheral wall 1548 that supports the first guide slope 1542. The support peripheral wall 1548 may extend downward from the first guide slope 1542. For example, the support peripheral wall 1548 extends downward from the lower surface of the first guide slope 1542, and may have an annular shape extending along the circumference of the guide rim 154. The support peripheral wall 1548 may be spaced outwardly from the inner peripheral wall 1544. The extended length of the support peripheral wall 1548 may be longer than the extended length of the inner peripheral wall 1544. The support peripheral wall 1548 may support the load of the water tank cover 150. The support peripheral wall 1548 may be seated on the protruding rib (see FIG. 22, 146) of the case 10 described later.

[0125] Referring to FIG. 12, the guide rim 154 may include a fastening rib.

[0126] The fastening rib 1546 may extend outward from the inner peripheral wall 1544. The fastening rib 1546 may be detached from a fastening stopper 1528 described later. When the fastening rib 1546 is coupled to the fastening stopper 1528, the guide cover 152 and the guide rim 154 may be coupled. When the fastening rib 1546 is separated from the fastening stopper 1528, the guide cover 152 may be separated from the guide rim 154. There may be provided a plurality of fastening ribs 1546. A plurality of fastening ribs 1546 may be formed to be spaced apart from each other along the inner peripheral wall 1544. For example, four fastening ribs 1546 may be formed in all directions on the inner peripheral wall 1544.

[0127] Referring to FIG. 13, the guide cover 152 may include a guide plate 1522, a border wall 1524, and a water supply hole 1500.

[0128] The guide plate 1522 may guide the supplied water to the water supply hole 1500. The guide plate 1522 may be spaced inward from the border wall 1524. The water supply hole 1500 may be formed in the outer circumference of the guide plate 1522. The guide plate 1522 may be formed in a plate shape. The guide plate 1522 may be lowered as it approaches the water supply hole 1500. The guide plate 1522 may become lower as it progresses toward the outside. The guide plate 1522 may be inclined downward in a direction approaching the water supply hole 1500. The guide plate 1522 may extend downward in the radial direction. The guide plate 1522 may be inclined downward in a direction from the center toward the edge. The guide plate 1522 may be defined to be convex upward. For example, the guide plate 1522 may have a convex upper surface and a concave lower surface.

[0129] The guide cover 152 may include a guide rib 1523 protruding from the edge of the guide plate 1522. The location of the guide rib 1523 may correspond to the location of the water supply hole 1500. For example, the water supply hole 1500 may be formed to extend in the circumferential direction of the guide plate 1522, and the location of the guide rib 1523 may correspond to the location where the water supply hole 1500 is formed based on the circumferential direction of the guide plate 1522. That is, the guide rib 1523 may protrude upward from the upper surface of the guide plate 1522, and may extend along the water supply hole 1500. The guide rib 1523 may guide water flowing through the guide plate 1522 to bypass the guide plate 1522 and flow into the water supply hole 1500. Alternatively, water flowing through the guide plate 1522 may pass over the guide rib 1523 and flow into the water supply hole 1500.

[0130] The guide cover 152 may include a connection portion 1526 connecting the border wall 1524 and the guide plate 1522. The connection portion 1526 may be formed between the plurality of water supply holes 1500. The water supply hole 1500 may be formed between the connection portions 1526. The water supply hole 1500 may be formed by cutting the connection portion 1526.

[0131] The border wall 1524 may be spaced apart from the outer circumference of the guide plate 1522 in an outward direction. The border wall 1524 may extend in the vertical direction. The border wall 1524 may reduce the amount of supplied water passing over the guide cover 152. The border wall 1524 may guide the supplied water to be discharged to the water supply hole 1500. The border wall 1524 may be coupled to the guide rim 154. The border wall 1524 may include a fastening stopper 1528 fastened to the guide rim. The guide rim 154 may include a fastening rib 1546 corresponding to the fastening stopper 1528.

[0132] The water supply hole 1500 may be formed by penetrating the guide cover 152. The water supply hole 1500 may be located between the guide plate 1522 and the border wall 1524. The water supply hole 1500 may be formed along the inner surface of the border wall 1524.

There may be a plurality of water supply holes 1500. The plurality of water supply holes 1500 may be located spaced apart from each other along the circumference of the guide plate 1522.

[0133] Referring to FIG. 14, the guide cover 152 may include a guide rib 1523.

[0134] The guide rib 1523 may protrude from the guide plate 1522. The guide rib 1523 may protrude upward from the guide plate 1522. The guide rib 1523 may extend along the direction in which the water supply hole 1500 extends. The guide rib 1523 may be formed at the edge of the guide plate 1522. The distance from the center of the guide plate 1522 to the guide rib 1523 may be shorter than the distance from the center of the guide plate 1522 to the water supply hole 1500. The number of guide ribs 1523 may correspond to the number of water supply holes 1500. The height at which the guide rib 1523 protrudes in the vertical direction may be smaller than the height of the border wall 1524 in the vertical direction. Water flowing to the edge along the surface of the guide plate 1522 may flow along the guide rib 1523, and flow into lateral sides of the water supply hole 1500. The lateral sides of the water supply hole 1500 may be one end and the other end of the water supply hole 1500 extending along the circumferential direction of the guide plate 1522.

[0135] Referring to FIG. 16, the water tank housing 120 may be accommodated in the inner shell 130, and the inner shell 130 may be disposed in the upper side of the middle tray 400.

[0136] The water tank housing 120 may include a first housing support 124a. The first housing support 124a may protrude from the water tank housing 120. The first housing support 124a may extend from the lower surface of the water tank housing 120. For example, the first housing support 124a may extend downward from the lower surface of the water tank housing 120. The first housing support 124a may support the water tank housing 120. The first housing support 124a may transmit the load of the water tank housing 120 and/or the water tank 110 downward. There may be a plurality of first housing supports 124a. The plurality of first housing supports 124a may be disposed to be spaced apart from each other on the lower surface of the water tank housing 120. A plurality of first housing supports 124a may be disposed on the lower surface of the water tank housing 120 in the circumferential direction. A plurality of first housing supports 124a may be radially disposed on the lower surface of the water tank housing 120. For example, a pair of first housing supports 124a may extend downward from the lower surface of the water tank housing 120, and the pair of first housing supports 124a may be spaced apart in opposite radial directions based on the center of the lower surface of the water tank housing 120.

[0137] The water tank housing 120 may include a second housing support 124b. The second housing support 124b may protrude from the water tank housing 120. The second housing support 124b may extend from the lower surface of the water tank housing 120. For example, the second housing support 124b may extend downward from the lower surface of the water tank housing 120. The second housing support 124b may support the water tank housing 120. The second housing support 124b may transmit the load of the water tank housing 120 and/or the water tank 110 downward. The second housing support 124b may prevent the water tank housing 120 from tipping over. The second housing support 124b may be located between the plurality of first housing supports 124a. For example, the pair of first housing supports 124a may be located spaced apart in a first radial direction and in a direction opposite to the first radial direction based on the center of the lower surface of the water tank housing 120, and the second housing support 124b may be located in a second radial direction perpendicular to the first radial direction.

[0138] An injection device 114 may penetrate the lower surface of the water tank housing 120. The injection device 114 may protrude from the lower surface of the water tank housing 120. The injection device 114 may be mounted in the supply pipe 210 of the humidifying device 200.

[0139] The inner shell 130 may accommodate the water tank housing 120. The upper side of the inner shell 130 may be open. The water tank housing 120 may be inserted into the open upper side of the inner shell 130. The water tank housing 120 may be inserted into the open upper side of the inner shell 130 and mounted therein. The inner shell 130 may be spaced apart from the water tank housing 120 in an outward direction. The diameter of the inner shell 130 may be larger than the diameter of the water tank housing 120. A separation gap may be formed between the inner shell 130 and the water tank housing 120. A discharge flow path 1000 may be formed between the inner peripheral wall 132 and the housing peripheral wall 122. For example, a first discharge flow path 1000a through which humidified air flows may be formed between the inner peripheral wall 132 and the housing peripheral wall 122. The lower surface of the inner shell 130 may be spaced apart from the lower surface of the water tank housing 120 in an outward direction. The lower surface of the inner shell 130 may be spaced downward from the lower surface of the water tank housing 120. A separation gap may be formed between the lower surface of the inner shell 130 and the lower surface of the water tank housing 120. The discharge flow path 1000 may be formed between the lower surface of the inner shell 130 and the lower surface of the water tank housing 120. For example, the first discharge flow path 1000a through which humidified air flows may be formed between the inner peripheral wall 132 and the housing peripheral wall 122.

[0140] The inner shell 130 may include a shell inlet 1304 through which humidified air flows in. The shell inlet 1304 may be formed in the lower surface of the inner shell 130. The shell inlet 1304 may correspond to the humid air outlet 2742 of the humidifying device 200. For

example, the humidified air generated from the humidifying device 200 may be discharged through the humid air outlet 2742, and the discharged humidified air may flow into the inside of the inner shell 130 through the shell inlet 1304. The inflow humidified air may flow through the first discharge flow path 1000a formed inside the inner shell 130.

[0141] The inner shell 130 may include a first shell support 134a. The first shell support 134a may protrude from the inner shell 130. The first shell support 134a may extend from the lower surface of the inner shell 130. For example, the first shell support 134a may extend downward from the lower surface of the inner shell 130. The first shell support 134a may support the inner shell 130. The first shell support 134a may transmit the load of the inner shell 130, the water tank housing 120, and/or the water tank 110 downward. There may be a plurality of first shell supports 134a. The plurality of first shell supports 134a may be disposed to be spaced apart from each other on the lower surface of the inner shell 130. The plurality of first shell supports 134a may be disposed on the lower surface of the inner shell 130 in the circumferential direction. The plurality of first shell supports 134a may be radially disposed on the lower surface of the inner shell 130. For example, the pair of first shell supports 134a may extend downward from the lower surface of the inner shell 130, and the pair of first shell supports 134a may be spaced apart in opposite radial directions based on the center of the lower surface of the inner shell 130. The first housing support 124a may be disposed in the upper side of the first shell support 134a. The first housing support 124a may transmit a load to the first shell support 134a. The location of the first shell support 134a may correspond to the location of the first housing support 124a. The number of first shell supports 134a may correspond to the number of first housing supports 124a.

[0142] The inner shell 130 may include a second shell support 134b. The second shell support 134b may protrude from the inner shell 130. The second shell support 134b may extend from the lower surface of the inner shell 130. For example, the second shell support 134b may extend downward from the lower surface of the inner shell 130. The second shell support 134b may support the inner shell 130. The second shell support 134b may transmit the load of the inner shell 130. The second shell support 134b may prevent the inner shell 130 from tipping over. The second shell support 134b may be located between the plurality of first shell supports 134a. For example, the pair of first shell supports 134a may be located spaced apart in a first radial direction and in a direction opposite to the first radial direction based on the center of the lower surface of the inner shell 130, and the second shell support 134b may be located in a second radial direction perpendicular to the first radial direction. The second housing support 124b may be disposed in the upper side of the second shell support 134b. The second housing support 124b may transmit the load to the second shell support 134b. The location of the second shell support 134b may correspond to the location of the second housing support 124b. The number of second shell supports 134b may correspond to the number of second housing supports 124b.

[0143] The inner shell 130 may include a shell injection hole 1302 into which the injection device 114 is inserted. The shell injection hole 1302 may be formed in the lower surface of the inner shell 130. The shell injection hole 1302 may be a through hole formed in the lower surface of the inner shell 130.

[0144] The middle tray 400 may be disposed in the upper side of the humidifying device 200. The middle tray 400 may be disposed in the lower side of the inner shell 130. The inner shell 130 may be disposed in the upper side of the middle tray 400. The water tank housing 120 may be disposed in the upper side of the middle tray 400. The water tank 110 may be disposed in the upper side of the middle tray 400. The load of the water tank 110, the water tank housing 120, and/or the inner shell 130 may be transmitted to the middle tray 400. The middle tray 400 may detect the load of the upper side.

[0145] The middle tray 400 may include a middle injection hole 4002 so that water stored in the water tank flows to the humidifying device 200. The supply pipe 210 of the humidifying device 200 may be disposed in the middle injection hole 4002. The supply pipe 210 of the humidifying device 200 may be inserted into the middle injection hole 4002. The location of the middle injection hole 4002 may correspond to the location of the shell injection hole 1302.

[0146] The middle tray 400 may include a middle outlet 4004 through which humidified air generated in the humidifying device 200 is discharged. The middle outlet 4004 may correspond to the discharge pipe 274 of the humidifying device 200. The middle outlet 4004 may correspond to the shell inlet 1304. The middle outlet 4004 may be located between the discharge pipe 274 and the shell inlet 1304.

[0147] Referring to FIG. 17, the flow path unit 100 may include a water tank 110, an ion exchange resin 170, an inner shell 130, an outer shell 140, a discharge grill 160, a water tank cover 150, and a discharge flow path 1000.

[0148] A water storage space 1100 may be formed inside the water tank 110. The water storage space 1100 of the water tank 110 may be located in the center of the case 10. The water storage space 1100 may extend in the vertical direction. The water storage space 1100 may be opened upward. The water tank cover 150 may cover the open upper side of the water storage space 1100. The guide rim 154 may be located at the upper end of the water tank 110. The guide rim 154 may be disposed in the upper side of the upper end of the water tank 110. The guide cover 152 may be located in the upper side of the water storage space 1100. The guide cover 152 may cover the open upper side of the water storage space 1100.

[0149] The ion exchange resin 170 may be disposed

inside the water tank 110. The ion exchange resin 170 may be disposed in the water storage space 1100. The ion exchange resin 170 may change the composition of water stored in the water storage space 1100. The ion exchange resin 170 may exchange ions with water stored in the water storage space 1100. The ion exchange resin 170 may selectively remove or replenish some ions contained in the water stored in the water storage space 1100. The ion exchange resin 170 may include a cation exchange resin and an anion exchange resin. The cation exchange resin may absorb positive ions contained in the water stored in the water storage space 1100. The cation exchange resin may emit positive ions to the water stored in the water storage space 1100. The anion exchange resin may absorb negative ions contained in the water stored in the water storage space 1100. The anion exchange resin may allow the water stored in the water storage space 1100 to emit negative ions.

[0150] The inner shell 130 may be located outside the water tank 110. The discharge flow path 1000 may be formed between the inner shell 130 and the water tank 110. The discharge flow path 1000 may be formed between the inner peripheral wall 132 and the water tank peripheral wall 112. The discharge flow path 1000 may be formed between the lower surface of the inner shell 130 and the lower surface of the water tank housing 120. For example, the first discharge flow path 1000a may be formed between the inner shell 130 and the water tank. The first discharge flow path 1000a may be formed outside the water storage space 1100. The first discharge flow path 1000a may be connected to the discharge flow path 2740 of the humidifying device 200.

[0151] The outer shell 140 may be located outside the inner shell 130. The discharge flow path 1000 may be formed between the outer shell 140 and the inner shell 130. The discharge flow path 1000 may be formed between the outer peripheral wall 142 and the inner peripheral wall 132. For example, the second discharge flow path 1000b may be formed between the outer shell 140 and the inner shell 130. The second discharge flow path 1000b may be formed outside the first discharge flow path 1000a. The second discharge flow path 1000b may be connected to the blowing flow path 390.

[0152] The outer shell 140 may include a first outer shell 140a and a second outer shell 140b coupled to the upper side of the first outer shell 140a. The first outer shell 140a may be formed to be transparent. The first outer shell 140a may be formed so that its interior is visible. The first outer shell 140a may be formed of a light-transmissive material. The second outer shell 140b may be formed to be opaque. The second outer shell 140b may extend upward from the upper end of the first outer shell 140a. The first outer shell 140a may form the lower portion of the outer shell 140, and the second outer shell 140b may form the remaining portion of the outer shell 140.

[0153] A discharge hole 1600 may be formed in one end of the discharge flow path 1000. A first discharge hole 1600a may be formed in one end of the first discharge flow path 1000a. A second discharge hole 1600b may be formed in one end of the second discharge flow path 1000b. One end of the first discharge flow path 1000a and one end of the second discharge flow path 1000b may be joined to define the discharge hole 1600.

[0154] The discharge grill 160 may be disposed in the discharge hole 1600. The discharge grill 160 may be disposed between the inner shell 130 and the outer shell 140. The discharge grill 160 may be disposed outside the water tank cover 150. The discharge grill 160 may extend in an annular shape along the inner circumference of the upper end of the outer shell 140. The discharge grill 160 may extend in an annular shape along the outer circumference of the upper end of the inner shell 130. The discharge grill 160 may include a plurality of discharge vanes 162. A plurality of discharge vanes 162 may be disposed along the inner circumference of the upper end of the outer shell 140. The discharge vane 162 may extend in the vertical direction. The plurality of discharge vanes 162 may be disposed radially spaced apart from each other. The plurality of discharge vanes 162 may be spaced apart from each other along the circumference of the discharge hole 1600.

[0155] The water tank cover 150 may be seated on the discharge grill 160. The water tank cover 150 may be separately coupled to the upper side of the discharge grill 160.

[0156] Referring to FIG. 18, the flow path unit 100 may include a water tank housing 120 in which the water tank 110 is accommodated.

[0157] The water tank housing 120 may accommodate the water tank 110. The water tank housing 120 may be disposed between the inner shell 130 and the water tank 110. The water tank 110 may be in close contact with the water tank housing 120. For example, the water tank peripheral wall 112 may be in close contact with the inner side of the housing peripheral wall 122. The first discharge flow path 1000a may be formed between the water tank housing 120 and the inner shell 130. The first discharge hole 1600a may be formed between the upper end of the water tank housing 120 and the upper end of the inner shell 130. The first discharge hole 1600a and the second discharge hole 1600b may be joined.

[0158] Referring to FIGS. 19 to 21, the water supply hole 1500 may be located in the upper side of the water storage space 1100.

[0159] The guide plate 1522 may cover the open upper side of the water storage space 1100. The outer circumference of the guide plate 1522 may extend along the circumferential direction of the upper end of the water tank 110. The diameter of the guide plate 1522 may be smaller than the diameter of the water tank 110. The guide plate 1522 may be located above the water tank 110. The guide plate 1522 may be located above the upper end of the water tank 110. For example, the outer circumference of the guide plate 1522 may be located above the upper end of the water tank 110. The guide

plate 1522 may be spaced inward from the upper end of the water tank 110. For example, the outer circumference of the guide plate 1522 may be spaced inward in the horizontal direction from the circumference of the upper end of the water tank 110.

[0160] The border wall 1524 of the guide cover 152 may be spaced apart from the guide plate 1522 in an outward direction. The border wall 1524 may extend along the circumference of the guide plate 1522. The diameter of the border wall 1524 may be larger than the diameter of the guide plate 1522. The water supply hole 1500 may be formed between the border wall 1524 and the guide plate 1522. The border wall 1524 may be located above the water tank 110. The border wall 1524 may be located above the upper end of the water tank 110. The border wall 1524 may be located in an inner side than to the upper end of the water tank 110. For example, the inner surface of the border wall 1524 may be spaced in an inner side in a horizontal direction than to the circumference of the upper end of the water tank 110.

[0161] The water supply hole 1500 may be formed between the guide rim 154 and the guide cover 152. The water supply hole 1500 may be formed between the border wall 1524 and the guide plate 1522. The water supply hole 1500 may be located in the upper side of the water storage space 1100. The water supply hole 1500 may be adjacent to the upper end of the water tank 110. The water supply hole 1500 may be located in an inner side than to the upper end of the water tank 110. For example, the water supply hole 1500 may be located in an inner side in a horizontal direction than to the upper end of the water tank 110. The inner side may refer to a central direction of the water tank 110 or an opposite direction to the radial direction. The water supply hole 1500 may extend along the circumferential direction of the upper end of the water tank 110. There may be a plurality of water supply holes 1500. The plurality of water supply holes 1500 may be disposed to be spaced apart from each other along the circumference of the guide cover 152.

[0162] The discharge grill 160 may be coupled to the case 10. The case 10 may include a protruding rib 146 on which the discharge grill 160 is seated. The protruding rib 146 may protrude inward from the inner wall of the case 10. The protruding rib 146 may protrude inward from the inner wall of the outer shell 140. The discharge grill 160 may be seated on the protruding rib 146. The discharge grill may include an outer wall 166 forming an outer circumference. The outer wall 166 may be seated on the protruding rib 146. The discharge grill 160 may include an inner rim 164 forming an inner circumference. The inner rim 164 may be spaced inward from the outer wall 166. The discharge vane 162 may be disposed between the outer wall 166 and the inner rim 164. The outer wall 166 and the inner rim 164 may be formed in an annular shape. The plurality of discharge vanes 162 may be disposed to be spaced apart from each other between the outer wall 166 and the inner rim 164. The discharge vane 162 may be spaced upward from the inner shell 130. The discharge vane 162 may not be in contact with the inner shell 130. For example, the plurality of discharge vanes 162 may be spaced upward from the upper end of the inner shell 130. Accordingly, the load of the discharge grill 160 may not be transmitted to the inner shell 130.

[0163] The water tank cover 150 may be disposed in the upper side of the discharge grill 160. The guide rim 154 may be seated on the inner rim 164 of the discharge grill 160. For example, the support peripheral wall 1548 of the guide rim 154 may be seated on the inner rim 164 of the discharge grill 160. The guide rim 154 may be spaced upward from the upper end of the water tank 110. Accordingly, the water tank cover 150 may be spaced upward from the water tank 110. The water tank cover 150 may not be in contact with the water tank 110. The water tank cover 150 may not transmit a load to the water tank 110.

[0164] The inner peripheral wall 1544 of the guide rim 154 may be located inside relative to the outer circumference of the guide plate 1522. For example, the inner peripheral wall 1544 of the guide rim 154 may be spaced in the inner side in the horizontal direction than to the outer circumference of the guide plate 1522. The inner peripheral wall 1544 of the guide rim 154 may be located above the guide plate 1522. The inner peripheral wall 1544 of the guide rim 154 may be spaced upward from the upper surface of the guide plate 1522. Water supplied to the guide cover 152 may flow to the edge along the inclined upper surface of the guide plate 1522 (Fa2). The supplied water may flow toward the water supply hole 1500 through a separation gap between the inner peripheral wall 1544 and the guide plate 1522 (Fa2). In addition, water splashed to the outside of the guide cover 152 during the water supply process may be guided to the water supply hole 1500 by the guide rim 154 (Fa1). That is, the first guide slope 1542 may guide water splashed around the guide cover 152 to the water supply hole 1500 (Fa1). Water passed through the water supply hole 1500 may fall into the water storage space 1100. The water passed through the water supply hole 1500 may flow downward along the water tank peripheral wall 112. The border wall 1524 may prevent the water passed through the water supply hole 1500 from flowing over to the outside of the water tank 110.

[0165] Referring to FIGS. 22 and 23, a water tank handle 180 may be coupled to the upper end of the water tank 110.

[0166] The water tank handle 180 may be fastened to the water tank 110. The water tank handle 180 may be rotated and fastened to the water tank 110. The water tank 110 may be formed with a fastening protrusion 114 to which the water tank handle 180 is fastened. The fastening protrusion 114 may protrude outward from the outer surface of the water tank 110. Alternatively, the fastening protrusion 114 may protrude inward from the inner

surface of the water tank 110.

[0167] The water tank handle 180 may include a handle rim 182 coupled to the upper end of the water tank 110. The handle rim 182 may extend along the circumference of the upper end of the water tank 110. The handle rim 182 may be formed in an annular shape.

[0168] The water tank handle 180 may include a handle bar 188. A user may move the water tank 110 by holding the handle bar 188. For example, a user may separate the water tank 110 from the case 10 by holding the handle bar 188 and pulling upward. In addition, a user may hold the handlebar 188 and insert the water tank 110 into the case. The handlebar 188 may be formed in a straight line. The handlebar 188 may be coupled to the handle rim 182. The handlebar 188 may extend diametrically to the handle rim 182.

[0169] Referring to FIGS. 24 and 25, the humidifier 1 may include a second guide slope 186.

[0170] The second guide slope 186 may be inclined downward in the inward direction. The second guide slope 186 may extend downward in the center direction. The second guide slope 186 may be located in an inner side than to the first guide slope 1542. The second guide slope 186 may be located below the first guide slope 1542. The second guide slope 186 may be located in the lower side of the water supply hole 1500. The upper end of the second guide slope 186 may be located in an outer side than to the water supply hole 1500. For example, the upper end of the second guide slope 186 may be located in an outer side in the horizontal direction than to the inner surface of the border wall 1524. The lower end of the second guide slope 186 may be located in an inner side than to the water supply hole 1500. For example, the lower end of the second guide slope 186 may be located in an inner side in the horizontal direction than to the outer circumference of the guide plate 1522.

[0171] The supplied water may pass through the water supply hole 1500 and fall into the water storage space 1100 along the second guide slope 186.

[0172] The handle rim 182 may include a fastening space 1820 into which the upper end of the water tank 110 is inserted. The fastening space 1820 may be formed inside the handle rim 182. The handle rim 182 may include a fastening protrusion 184 corresponding to the fastening protrusion 114. The fastening protrusion 184 may protrude from the handle rim 182 toward the fastening space 1820. The fastening protrusions 184 may be rotated along the fastening protrusions 114 and fastened to each other.

[0173] The handle bar 188 may be formed with a handle slope 1882 that is inclined downward. The handle slope 1882 may form one surface of the handle bar 188. The handle slope 1882 may form the side surface of handle bar 188. The handle slope 1882 may be inclined downward in an outward direction.

[0174] Referring to FIGS. 26 and 27, the water stored in the water storage space 1100 may be supplied to the humidifying device 200.

[0175] The water stored in the water storage space 1100 may be supplied to the humidifying device 200 through the injection device 114. The injection device 114 may be mounted in the lower side of the water tank 110. The injection device 114 may be disposed in a housing injection hole (no reference numeral) of the water tank housing 120. The injection device 114 may be disposed in the shell injection hole 1302 of the inner shell 130. The housing injection hole (no reference numeral) and the shell injection hole 1302 may form an injection space 102. The injection device 114 may be disposed in the injection space 102. The water stored in the water storage space 1100 may be injected into the supply pipe 210 through the injection device 114.

[0176] The shell inlet 1304 of the inner shell 130 may be connected to the humid air outlet 2742 of the humidifying device 200. Water overflowing to the outside of the water tank 110 during the water supply process may flow to the first discharge flow path 1000a. Water that falls into the first discharge flow path 1000a may flow into the humidifying device 200 through the humid air outlet 2742. Water that falls into a space between the inner shell 130 and the water tank 110 may flow into the humidifying water tank 260 through the humid air outlet 2742. Water flowing into the humidifying water tank 260 may be atomized by the vibration device 262.

[0177] Referring to FIG. 28, the middle tray 400 may include a middle housing 410, a light diffuser 450, and a load sensor 480.

[0178] The middle tray 400 may include a middle housing 410 that forms an outer shape. The circumference of the middle housing 410 may extend in the vertical direction. The inner shell 130 may be seated on the upper side of the middle housing 410. The water tank 110, the water tank housing 120, and/or the inner shell 130 may be disposed on the upper side of the middle tray 400. The humidifying device 200 may be disposed in the lower side of the middle tray 400. The middle tray 400 may be seated on the upper surface of the humidifying device 200.

[0179] The middle tray 400 may include a light diffuser 450. The light diffuser 450 may emit light. The light diffuser 450 may form the inner surface of the peripheral wall of the middle tray 400. The light diffuser 450 may be coupled to the middle housing 410. The light diffuser 450 may transmit light.

[0180] The middle tray 400 may include a load sensor 480 that detects load. The load sensor 480 may be disposed in the upper surface of the middle tray 400. The load sensor 480 may be in contact with the inner shell 130. The inner shell 130 may pressurize the load sensor 480. The load sensor 480 may convert load into an electrical signal. The load sensor 480 may convert displacement in the vertical direction into an electrical signal. The load sensor 480 may detect the level of water stored in the water tank 110. There may be provided a plurality of load sensors 480. For example, a pair of load sensors 480 may be disposed in the upper surface of the middle

tray 400.

[0181] Referring to FIG. 29, the middle tray 400 may include a middle cover 430, a middle base 440, a middle plate 420, and a lighting device 460.

[0182] The middle tray 400 may include a middle cover 430. The middle housing 410 may include a middle cover 430. The middle cover 430 may form the outer circumference of the middle housing 410. The middle cover 430 may be a peripheral wall extending in the vertical direction. The middle cover 430 may be coupled to the light diffuser 450.

[0183] The middle tray 400 may include a middle base 440. The middle housing 410 may include a middle base 440. The middle base 440 may form the lower plate of the middle tray 400. The middle base 440 may be seated on the upper surface of the humidifying device 200. The middle cover 430 may be coupled to the middle base 440. For example, the middle cover 430 may be coupled upward to the middle base 440.

[0184] The middle tray 400 may include a middle plate 420. The middle housing 410 may include a middle plate 420. The middle plate 420 may form the upper surface of the middle tray 400. The inner shell 130 may be seated on the middle plate 420. The load of the water tank 110, the water tank housing 120, and/or the inner shell 130 may be transmitted to the middle plate 420. The load sensor 480 may be disposed in the middle plate 420.

[0185] The middle plate 420 may include a middle injection hole 4002 where the supply pipe 210 is disposed. The middle injection hole 4002 may be a through hole formed in the middle plate 420. The middle injection hole 4002 may be formed in the center of the middle plate 420.

[0186] The middle plate 420 may include a middle outlet 4004 through which humidified air passes. The middle outlet 4004 may be formed in one side of the middle plate 420. The middle outlet 4004 may be a through hole formed in the middle plate 420. The shape of the middle outlet 4004 may correspond to the shape of the humid air outlet 2742. The shell inlet 1304 of the inner shell 130 may be connected to the middle outlet 4004.

[0187] The light diffuser 450 may be coupled to the middle plate 420. The light diffuser 450 may be disposed between the middle cover 430 and the middle plate 420. The middle plate 420 may be disposed in the upper side of the middle base 440.

[0188] The middle plate 420 may include a support seating portion 4260. The second shell support 134b of the inner shell 130 may be seated on the support seating portion 4260. Meanwhile, the first shell support 134a of the inner shell 130 may pressurize the load sensor 480. The middle plate 420 may include a protruding end 426 forming the support seating portion 4260. The protruding end 426 may protrude upward from the middle plate 420. For example, the support seating portion 4260 may be formed between a pair of protruding ends 426 that protrude upward. The protruding end 426 may minimize a horizontal clearance of the second shell support 134b.

[0189] The middle tray 400 may include a lighting device 460 that emits light. The lighting device 460 may be disposed inside the middle housing 410. The lighting device 460 may be disposed between the middle cover 430 and the light diffuser 450. The lighting device 460 may be disposed in the lower side of the light diffuser 450. The lighting device 460 may be disposed in the upper side of the middle base 440. Light emitted from the lighting device 460 may be diffused by the light diffuser 450. Light emitted from the lighting device 460 may pass through the light diffuser 450 and diffuse into the case 10.

[0190] Referring to FIG. 30, the lighting device 460 may include a light source 462, a lighting substrate 464, and a lighting bracket 466.

[0191] The light source 462 may be mounted in the lighting substrate 464. The light source 462 may be disposed in the lower side of the light diffuser 450. The horizontal location of the light source 462 may be located between the horizontal location of the upper end of the light diffuser 450 and the horizontal location of the lower end of the light diffuser 450. The light source 462 may be located in an inner side in the horizontal direction than to the middle cover 430. For example, the light source 462 may be located in the inner side in the horizontal direction than to the inner end of the middle cover 430. The light source 462 may be spaced upward from the middle base 440. The light source 462 may be spaced apart from the light diffuser 450. The light diffuser 450 may be spaced upward from the light source 462 by a certain height H1.

[0192] The lighting substrate 464 may be disposed between the middle cover 430 and the middle plate 420. The lighting substrate 464 may be spaced upward from the middle base 440.

[0193] The lighting bracket 466 may fix the lighting substrate 464. The lighting bracket 466 may be connected to the middle cover 430. The lighting bracket 466 may fix the lighting substrate 464 to the middle cover 430. Through the lighting bracket 466, the lighting substrate 464 may be spaced upward from the middle base 440.

[0194] Referring to FIG. 30, the load sensor 480 may include a contact plate 482, a presser 484, and a sensor substrate 486.

[0195] The first housing support 124a of the water tank housing 120 may pressurize the first shell support 134a. The first housing support 124a may be located inside the first shell support 134a. The first housing support 124a may transmit the load of the water tank 110 and the water tank housing 120 to the first shell support 134a. The first shell support 134a may pressurize the load sensor 480. The first shell support 134a may contact the contact plate 482. The first shell support 134a may pressurize the contact plate 482, and thus the contact plate 482 may be lowered.

[0196] The presser 484 may extend downward from the contact plate 482. The presser 484 may transmit the load pressurized on the contact plate 482 to the sensor substrate 486. The presser 484 may penetrate the middle plate 420 and contact the sensor substrate 486 disposed

inside the middle housing 410.

[0197] The middle tray 400 may include a recess 422 in which the load sensor 480 is disposed. The recess 422 may be formed in the middle plate 420. The contact plate 482 may be disposed in the recess 422. The contact plate 482 disposed in the recess 422 may move in the vertical direction. The shape of the recess 422 may correspond to the shape of the contact plate 482. The recess 422 may be formed with a through hole into which the presser 484 is inserted.

[0198] The sensor substrate 486 may convert a load received from the presser 484 into an electrical signal. The sensor substrate 486 may detect the level of water stored in the water tank 110 based on the load.

[0199] The middle plate 420 may include a sensor stopper 424 that restricts the movement range of the contact plate 482. The sensor stopper 424 may be located in the lower side of the contact plate 482. The sensor stopper 424 may protrude upward from the recess 422. The sensor stopper 424 may extend along the circumference of the through hole formed in the recess 422. The sensor stopper 424 may be formed so that the circumference of the through hole formed in the recess 422 protrudes upward. The sensor stopper 424 may prevent the contact plate 482 from moving downward beyond a certain displacement. If the contact plate 482 moves downward beyond a certain displacement, the sensor stopper 424 contacts the lower surface of the contact plate 482, and the contact plate 482 may no longer move downward.

[0200] Referring to FIG. 30, the middle tray 400 may include a sealer 470.

[0201] The sealer 470 may include a first sealer 472 disposed between the light diffuser 450 and the middle housing 410. The first sealer 472 may be disposed in the lower side of the light diffuser 450. The first sealer 472 may be disposed in the upper side of the middle plate 420. The first sealer 472 may be disposed outside the circumference of the middle plate 420. The first sealer 472 may extend in the circumferential direction of the middle plate 420. The first sealer 472 may be formed in an annular shape. The first sealer 472 may be in close contact with the light diffuser 450. The first sealer 472 may be in close contact with the middle plate 420. The cross-section of the first sealer 472 may be formed in a circular shape.

[0202] The sealer 470 may include a second sealer 474 disposed in the lower side of the load sensor 480. The second sealer 474 may be disposed between the load sensor 480 and the middle plate 420. The second sealer 474 may be disposed in the recess 422. The second sealer 474 may be disposed outside the sensor stopper 424. For example, the second sealer 474 may be disposed between the sensor stopper 424 and the peripheral wall forming the recess 422. The second sealer 474 may separate the contact plate 482 upward from the sensor stopper 424. The second sealer 474 may buffer the load transmitted from the upper side. The second sealer 474 may be in close contact with the contact plate 482. The second sealer 474 may be in close contact with the recess 422. As the load transmitted to the contact plate 482 becomes greater, the second sealer 474 may come in closer contact with the contact plate 482 and the recess 422. The second sealer 474 may extend along the circumference of the recess 422. The second sealer 474 may be formed in an annular shape. The second sealer 474 may have a circular cross-section. The cross-sectional diameter of the second sealer 474 may be smaller than a gap between the sensor stopper 424 and the peripheral wall forming the recess 422. Accordingly, when the second sealer 474 is compressed by a load, the second sealer 474 may be expanded in the horizontal direction and compressed in the vertical direction.

[0203] Referring to FIGS. 1 to 30, a humidifier according to one aspect of the present invention includes: a humidifying device which generates humidified air; a water tank which has a water storage space open to an upper side, and supplies water to the humidifying device; and a water tank cover which covers the open upper side of the water tank, wherein the water tank cover comprises a water supply hole located in an upper side of the water storage space so that the supplied water falls into the water storage space, wherein the water supply hole is formed along a circumference of an upper end of the water tank.

[0204] According to another aspect of the present invention, the water supply hole may be located in an inner side in a horizontal direction than to the circumference of the upper end of the water tank.

[0205] According to another aspect of the present invention, the water tank cover includes: a guide rim which is disposed in an upper side of the upper end of the water tan, and extends along the circumference of the upper end of the water tank; and a guide cover which is coupled to the guide rim, and covers the upper side of the water storage space.

[0206] According to another aspect of the present invention, the guide cover includes a guide plate which covers the upper side of the water storage space, and is inclined downward as it approaches the water supply hole.

[0207] According to another aspect of the present invention, the guide cover includes a border wall which may be spaced outwardly from an outer circumference of the guide plate, and coupled to the guide rim.

[0208] According to another aspect of the present invention, the water supply hole may be formed between the outer circumference of the guide plate and the border wall.

[0209] According to another aspect of the present invention, the inner circumference of the guide rim may be spaced upward from the guide plate.

[0210] According to another aspect of the present invention, the guide rim may cover the upper side of the water supply hole.

[0211] According to another aspect of the present in-

vention, the guide plate includes a guide rib which protrudes upward from an edge, and extends along the water supply hole.

[0212] According to another aspect of the present invention, the guide cover may be formed to be transparent.

[0213] According to another aspect of the present invention, the guide plate includes a first guide slope inclined downward in a center direction of the guide plate.

[0214] According to another aspect of the present invention, the guide rim includes an inner peripheral wall extending downward from an inner circumference of the first guide slope.

[0215] According to another aspect of the present invention, the inner peripheral wall may be spaced upward from the guide plate.

[0216] According to another aspect of the present invention, the guide rim includes a fastening rib formed in a lower end of the inner peripheral wall, wherein the guide cover includes: a border wall which may be spaced outwardly from an outer circumference of the guide plate, and coupled to the guide rim; and a fastening stopper formed in an upper end of the border wall, wherein the fastening rib may be detachably coupled to the fastening stopper.

[0217] According to another aspect of the present invention, the border wall may extend downward and be disposed in the opening of the upper side of the water tank.

[0218] According to another aspect of the present invention, the humidifier further includes a case having an open upper side, wherein the humidifying device may be disposed inside the case, wherein the water tank may be disposed in an upper side of the humidifying device inside the case, and a discharge flow path through which humidified air flows may be formed between the case and the water tank.

[0219] According to another aspect of the present invention, the water tank cover includes: a guide rim which may be disposed in an upper side of the upper end of the water tank, and extends along a circumference of the upper end of the water tank; and a guide cover which may be coupled to the guide rim, and covers the upper side of the water storage space, wherein the guide rim includes a first guide slope inclined downward in center direction of the guide cover, wherein an outer circumference of the first guide slope may be located in an outer side in a horizontal direction than to the upper end of the water tank.

[0220] According to another aspect of the present invention, the case includes: an outer shell spaced horizontally outward from the water tank; and an inner shell which may be disposed inside the outer shell, and accommodates the water tank, wherein the discharge flow path includes: a first discharge flow path which may be formed between the water tank and the inner shell, and through which humidified air flows; and a second discharge flow path which may be formed between the inner shell and the outer shell, wherein the outer circumference of the first guide slope may be located in an inner side in a horizontal direction than to an upper end of the inner shell.

[0221] According to another aspect of the present invention, the inner shell has a shell inlet through which humidified air discharged from the humidifier flows in.

[0222] According to another aspect of the present invention, the humidifier further includes a water tank housing in which the water tank is accommodated; and a middle tray disposed between the humidifying device and the water tank housing, wherein the middle tray includes a load sensor located in the upper surface to detect a load, and the water tank housing can pressurize the load sensor.

[0223] According to another aspect of the present invention, the water tank housing may include a first housing support that extends downward from the lower surface and pressurizes the load sensor.

[0224] Referring to FIGS. 1 to 30, the humidifier according to one aspect of the present invention includes: a humidifying device which generates humidified air; a water tank which has a water storage space open to an upper side, and supplies water to the humidifying device; a water tank cover which covers the open upper side of the water tank; and a second guide slope which extends along a circumference of an upper end of the water tank, and may be inclined downward in a center direction of the water tank, wherein the water tank cover includes a water supply hole located in an upper side of the water storage space so that the supplied water falls into the water storage space, wherein the second guide slope may be located in a lower side of the water supply hole.

[0225] According to another aspect of the present invention, the humidifier further includes a water tank handle detachably coupled to the upper end of the water tank, wherein the water tank handle includes: a handle rim coupled to the upper end of the water tank; and the second guide slope extending inward from the handle rim.

[0226] According to another aspect of the present invention, the water tank cover includes: a guide rim which may be disposed in an upper side of the upper end of the water tank, and extends along a circumference of the upper end of the water tank; and a guide cover which may be coupled to the guide rim, and covers the upper side of the water storage space, wherein the guide cover includes: a guide plate which covers the upper side of the storage space, and may be inclined downward in an outward direction; and a border wall which may be spaced apart from an outer circumference of the guide plate in an outward direction, and coupled to the guide rim.

[0227] According to another aspect of the present invention, an outer circumference of the second guide slope may be located in an outer side in a horizontal direction than to the water supply hole.

[0228] According to another aspect of the present invention, an inner circumference of the second guide

slope may be located in an inner side in a horizontal direction than to the water supply hole.

[0229] According to at least one of the embodiments of the present invention, due to the water supply hole defined along the upper circumference of the water tank, the supplied water is guided to the inner wall of the water tank, thereby reducing noise generated during the water supply process.

[0230] According to at least one of the embodiments of the present invention, the water supply hole is located in the inner side in the horizontal direction than to the upper circumference of the water tank, so that the supplied water is guided to the inside of the water tank so as not to overflow outside the water tank, thereby reducing the risk of internal flooding of the humidifier.

[0231] According to at least one of the embodiments of the present invention, due to the guide plate inclined downward as it approaches the water supply hole, the supplied water is guided to the water supply hole, thereby improving the user's water supply convenience.

[0232] According to at least one of the embodiments of the present invention, the border wall guides the supplied water to the water storage space, thereby reducing the amount of water flowing out of the water tank and the risk of internal flooding of the humidifier.

[0233] According to at least one of the embodiments of the present invention, the guide rib diverts the flow path of the water supplied, so that the inflow speed of the supplied water is lowered, thereby reducing the amount of water flowing out of the water tank and the risk of internal flooding of the humidifier.

[0234] According to at least one of the embodiments of the present invention, a user can visually check the water level inside the water tank through the transparent guide cover, thereby improving the convenience of water supply.

[0235] According to at least one of the embodiments of the present invention, the first guide slope guides the water splashed during the water supply process to the water supply hole, thereby reducing the amount of water flowing out of the water tank and the risk of internal flooding of the humidifier.

[0236] According to at least one of the embodiments of the present invention, the inner peripheral wall forms a space where excessively supplied water can be temporarily stored in the water tank cover, thereby improving the convenience of water supply.

[0237] According to at least one of the embodiments of the present invention, the downwardly extending border wall guides the water supplied into the water tank, thereby reducing the amount of water flowing out of the water tank and the risk of internal flooding of the humidifier.

[0238] According to at least one of the embodiments of the present invention, the water tank is disposed above the humidifying device, so that a user can easily attach and detach the water tank.

[0239] According to at least one of the embodiments of the present invention, the first guide slope guides the water splashed out of the guide cover to the water supply hole, thereby reducing the amount of water flowing out of the water tank and the risk of internal flooding of the humidifier.

[0240] According to at least one of the embodiments of the present invention, a user can check the water level inside the water tank by providing a load sensor that detects the load of the water tank, thereby improving the convenience of water supply.

[0241] According to at least one of the embodiments of the present invention, due to the fastening structure of the guide rim and the guide cover, the water tank cover can be easily cleaned by simplifying the water supply structure.

[0242] According to at least one of the embodiments of the present invention, due to the combined structure of separable outer shell, inner shell, water tank housing, and water tank, the internal cleaning of the case can be facilitated and the hygiene of the humidifier can be improved.

[0243] Certain embodiments or other embodiments of the invention described above are not mutually exclusive or distinct from each other. Any or all elements of the embodiments of the invention described above may be combined or combined with each other in configuration or function.

[0244] For example, a configuration "A" described in one embodiment of the invention and the drawings and a configuration "B" described in another embodiment of the invention and the drawings may be combined with each other. Namely, although the combination between the configurations is not directly described, the combination is possible except in the case where it is described that the combination is impossible.

[0245] Although embodiments have been described with reference to a number of illustrative embodiments thereof, it should be understood that numerous other modifications and embodiments may be devised by those skilled in the art that will fall within the scope of the principles of this invention. More particularly, various variations and modifications are possible in the component parts and/or arrangements of the subject combination arrangement within the scope of the invention, the drawings and the appended claims. In addition to variations and modifications in the component parts and/or arrangements, alternative uses will also be apparent to those skilled in the art.

Claims

1. A humidifier comprising:

a humidifying device (200) configured to generate humidified air;
a water tank (110) having a water storage space (1100) open to an upper side, and configured to

supply water to the humidifying device (200); and
a water tank cover (150) covering the open upper side of the water tank (110),
wherein the water tank cover (150) comprises a water supply hole (1500) positioned above an upper side of the water storage space (1100) allowing the supplied water to fall into the water storage space (1100),
wherein the water supply hole (1500) is defined along a circumference of an upper end of the water tank (110).

2. The humidifier of claim 1, wherein the water supply hole (1500) is positioned inward in a horizontal direction relative to the circumference of the upper end of the water tank (110),
and/or
wherein the water tank cover (150) comprises:

a guide rim (154) disposed above the upper end of the water tank (110), and extending along the circumference of the upper end of the water tank (110); and
a guide cover (152) coupled to the guide rim (154), and covering the upper side of the water storage space (1100).

3. The humidifier of claim 2, wherein the guide cover (152) comprises a guide plate (1522) covering the upper side of the water storage space (1100), and
wherein the guide plate (1522) is inclined downward as it approaches the water supply hole (1500).

4. The humidifier of claim 3, wherein the guide cover (152) comprises a border wall (1524) spaced outwardly from an outer circumference of the guide plate (1522), and coupled to the guide rim (154),
wherein the water supply hole (1500) is formed between the outer circumference of the guide plate (1522) and the border wall (1524).

5. The humidifier of claim 3 or 4, wherein the guide plate (1522) comprises a guide rib (1523) protruding upward from an edge, and extending along the water supply hole (1500).

6. The humidifier of any one of claims 2 to 5, wherein the guide cover (152) is defined to be transparent.

7. The humidifier of any one of claims 3 to 6, wherein the guide rim (154) comprises a first guide slope (1542) inclined downward toward a center of the guide plate (1522).

8. The humidifier of claim 7, wherein the guide rim (154) comprises an inner peripheral wall (1544) extending downward from an inner circumference of the first guide slope (1542),

and preferably
wherein the guide rim (154) comprises a fastening rib (1546) defined at a lower end of the inner peripheral wall (1544),
wherein the guide cover (152) comprises:

a border wall (1524) spaced outwardly from an outer circumference of the guide plate (1522), and coupled to the guide rim (154); and
a fastening stopper (1528) defined at an upper end of the border wall (1524),
wherein the fastening rib (1546) is detachably coupled to the fastening stopper (1528).

9. The humidifier of any one of claims 1 to 8, further comprising a case (10) having an open upper side,

wherein the humidifying device (200) is disposed inside the case (10),
wherein the water tank (110) is disposed above the humidifying device (200) inside the case (10), and
a discharge flow path (1000) through which humidified air flows is defined between the case (10) and the water tank (110).

10. The humidifier of any one of claims 2 to 9, wherein the water tank cover (150) comprises:

a guide rim (154) disposed above the upper end of the water tank (110), and extending along a circumference of the upper end of the water tank (110); and
a guide cover (152) coupled to the guide rim (154), and covering the upper side of the water storage space (1100),
wherein the guide rim (154) comprises a first guide slope (1542) inclined downward toward a center of the guide cover (152),
wherein an outer circumference of the first guide slope (1542) is positioned outward in a horizontal direction relative to the upper end of the water tank (110).

11. The humidifier of claim 10, wherein the case (10) comprises:

an outer shell (140) spaced horizontally outward from the water tank (110); and
an inner shell (130) which is disposed inside the outer shell (140), and accommodates the water tank (110),
wherein the discharge flow path (1000) comprises:

a first discharge flow path (1000a) which is defined between the water tank (110) and the inner shell (130), and through which humidified air flows; and
a second discharge flow path (1000b) which is defined between the inner shell (130) and the outer shell (140),
wherein the outer circumference of the first guide slope (1542) is positioned inward in a horizontal direction relative to an upper end of the inner shell (130),
and preferably
wherein the inner shell (130) has a shell inlet (1304) through which humidified air discharged from the humidifier (1) flows in.

12. A humidifier comprising:

a humidifying device (200) configured to generate humidified air;
a water tank (110) having a water storage space (1100) open to an upper side, and configured to supply water to the humidifying device (200);
a water tank cover (150) covering the open upper side of the water tank (110); and
a second guide slope (186) extending along a circumference of an upper end of the water tank (110), and inclined downward toward a center of the water tank (110),
wherein the water tank cover (150) comprises a water supply hole (1500) positioned above the water storage space (1100) allowing the supplied water to fall into the water storage space (1100),
wherein the second guide slope (186) is located below the water supply hole (1500).

13. The humidifier of claim 12, further comprising a water tank handle (180) detachably coupled to the upper end of the water tank (110), and
wherein the water tank handle (180) comprises:

a handle rim (182) coupled to the upper end of the water tank (110); and
the second guide slope (186) extending inward from the handle rim (182).

14. The humidifier of claim 12 or 13, wherein the water tank cover (150) comprises:

a guide rim (154) disposed above the upper end of the water tank (110), and extending along a circumference of the upper end of the water tank (110); and
a guide cover (152) coupled to the guide rim (154), and covering the upper side of the water storage space (1100),
wherein the guide cover (152) comprises:

a guide plate (1522) covering the upper side of the water storage space (1100), and inclined downward in an outward direction; and
a border wall (1524) spaced outwardly from an outer circumference of the guide plate (1522), and coupled to the guide rim (154).

15. The humidifier of any one of claims 1 to 14, wherein an outer circumference of the second guide slope (186) is positioned outward in a horizontal direction relative to the water supply hole (1500),
and/or
wherein an inner circumference of the second guide slope (186) is positioned inward in a horizontal direction relative to the water supply hole (1500).

FIG. 1

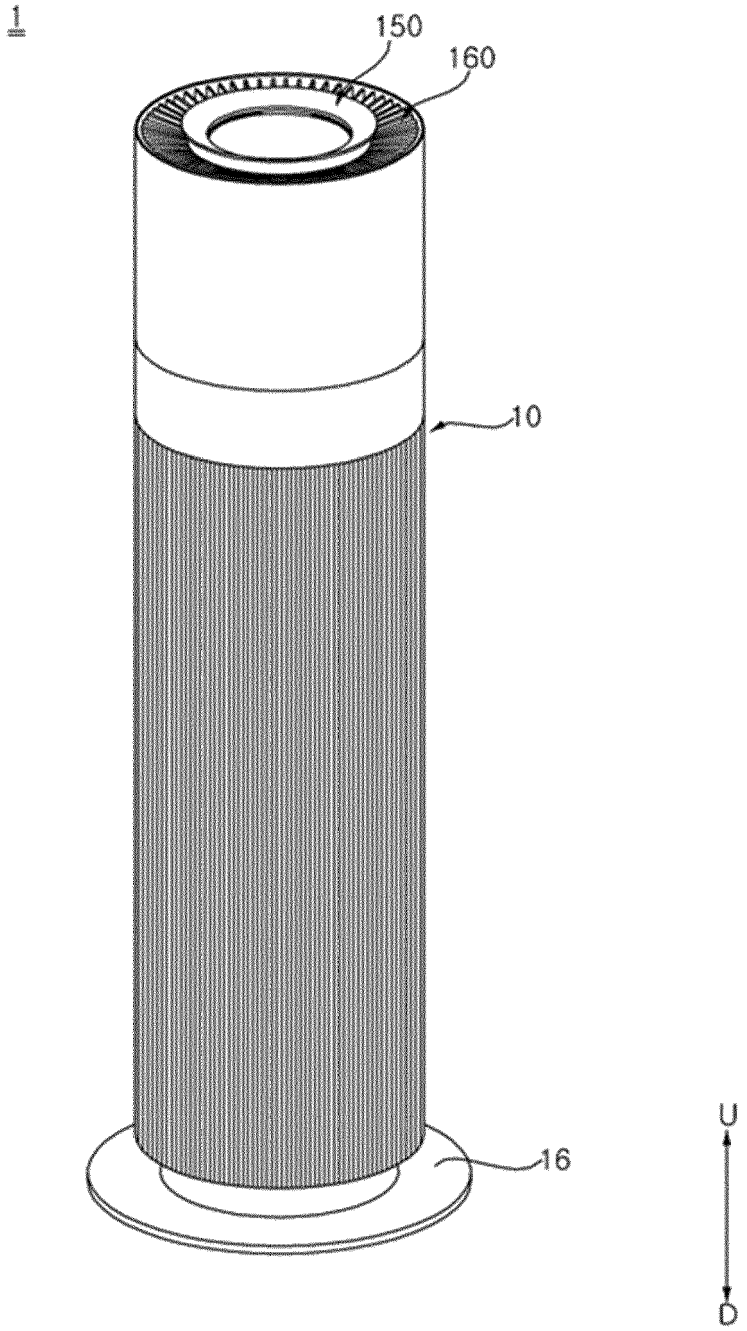


FIG. 2

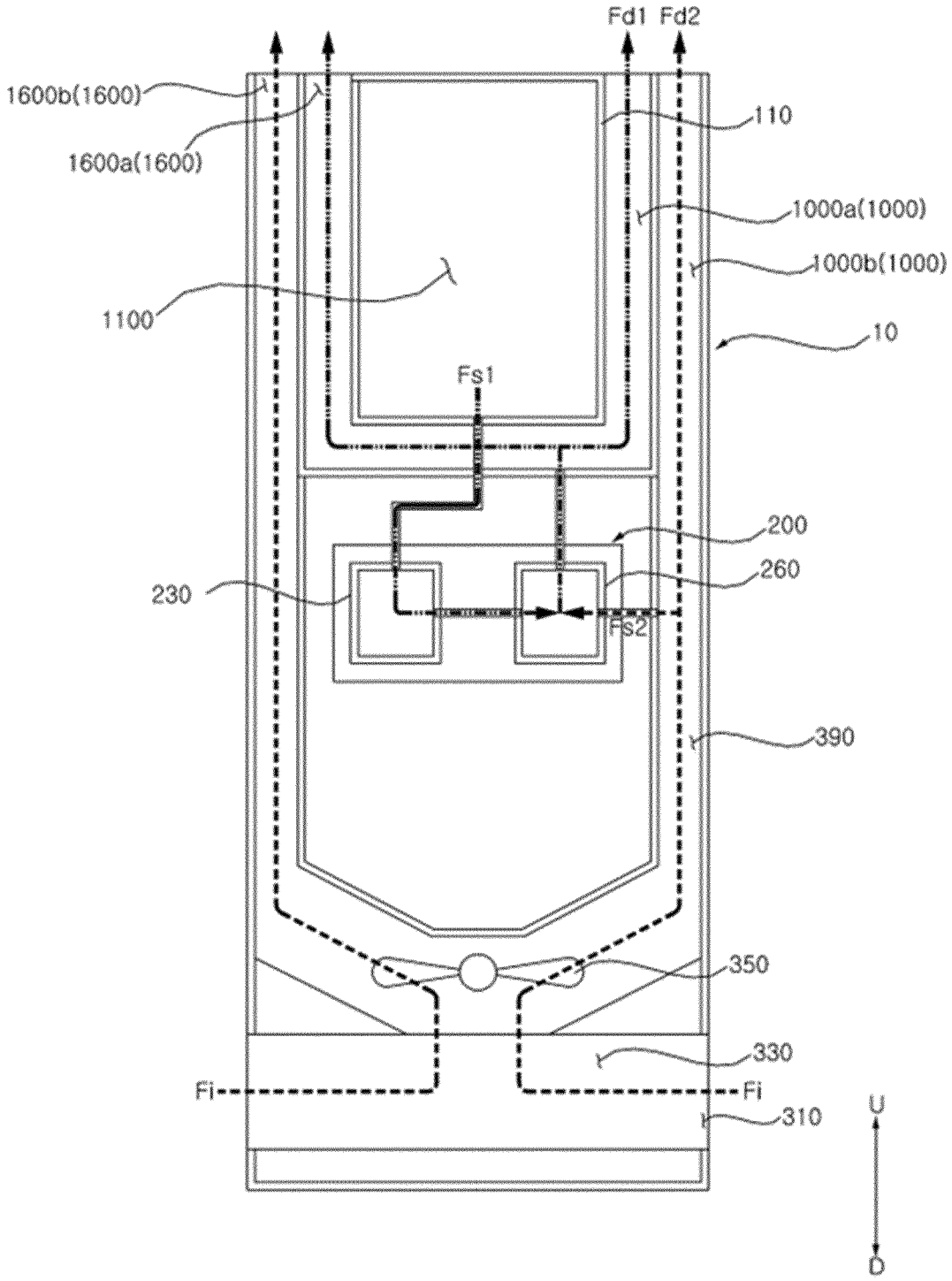

Fd1
Fd2
1600b(1600)
1600a(1600)
110
1000a(1000)
1000b(1000)
1100
10
Fs1
200
230
260
Fs2
390
350
330
Fi
Fi
310
U
D

FIG. 3

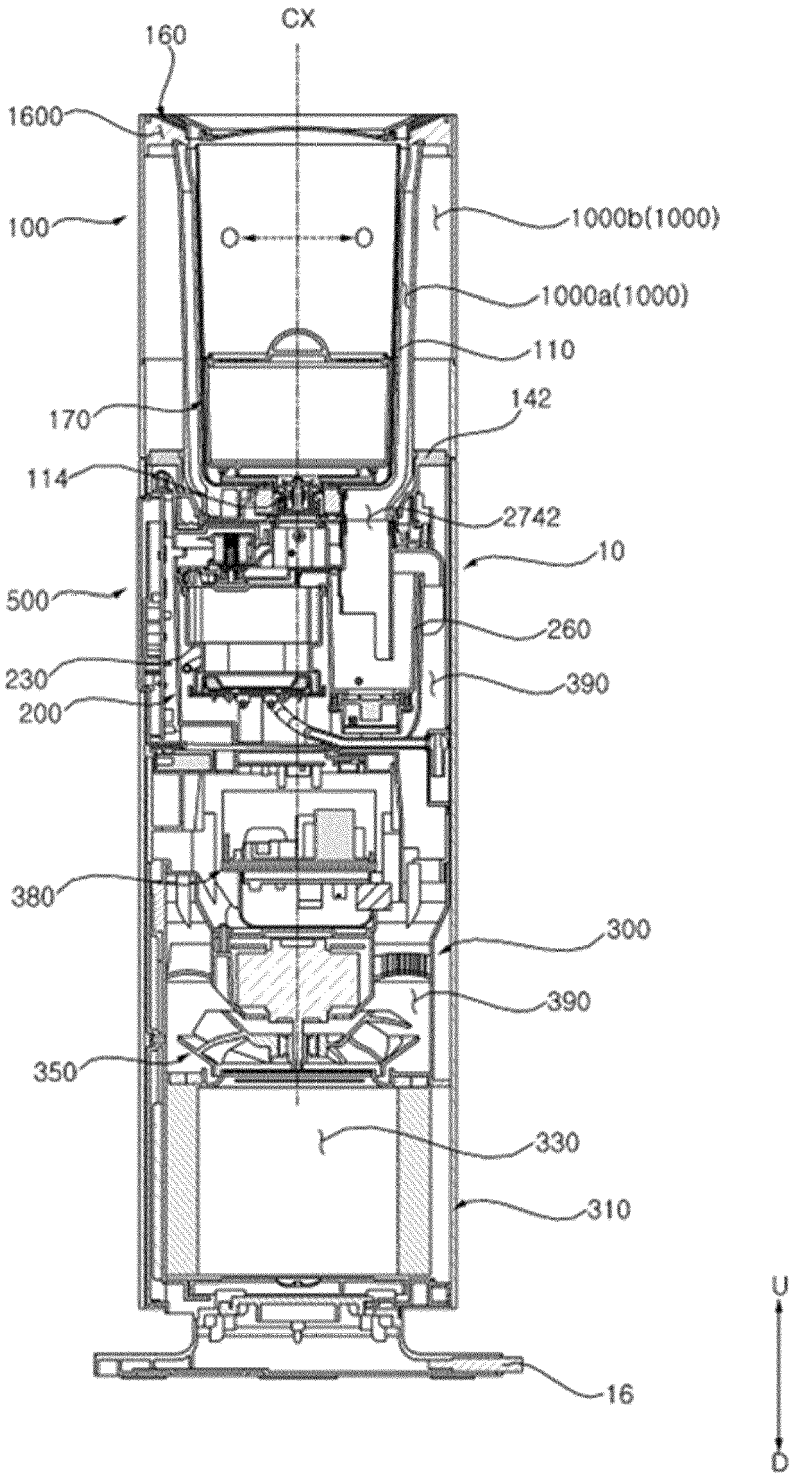

CX
160
1600
100
1000b(1000)
1000a(1000)
110
142
170
114
2742
10
500
260
230
390
200
380
300
390
350
330
310
16
U
D

FIG. 4

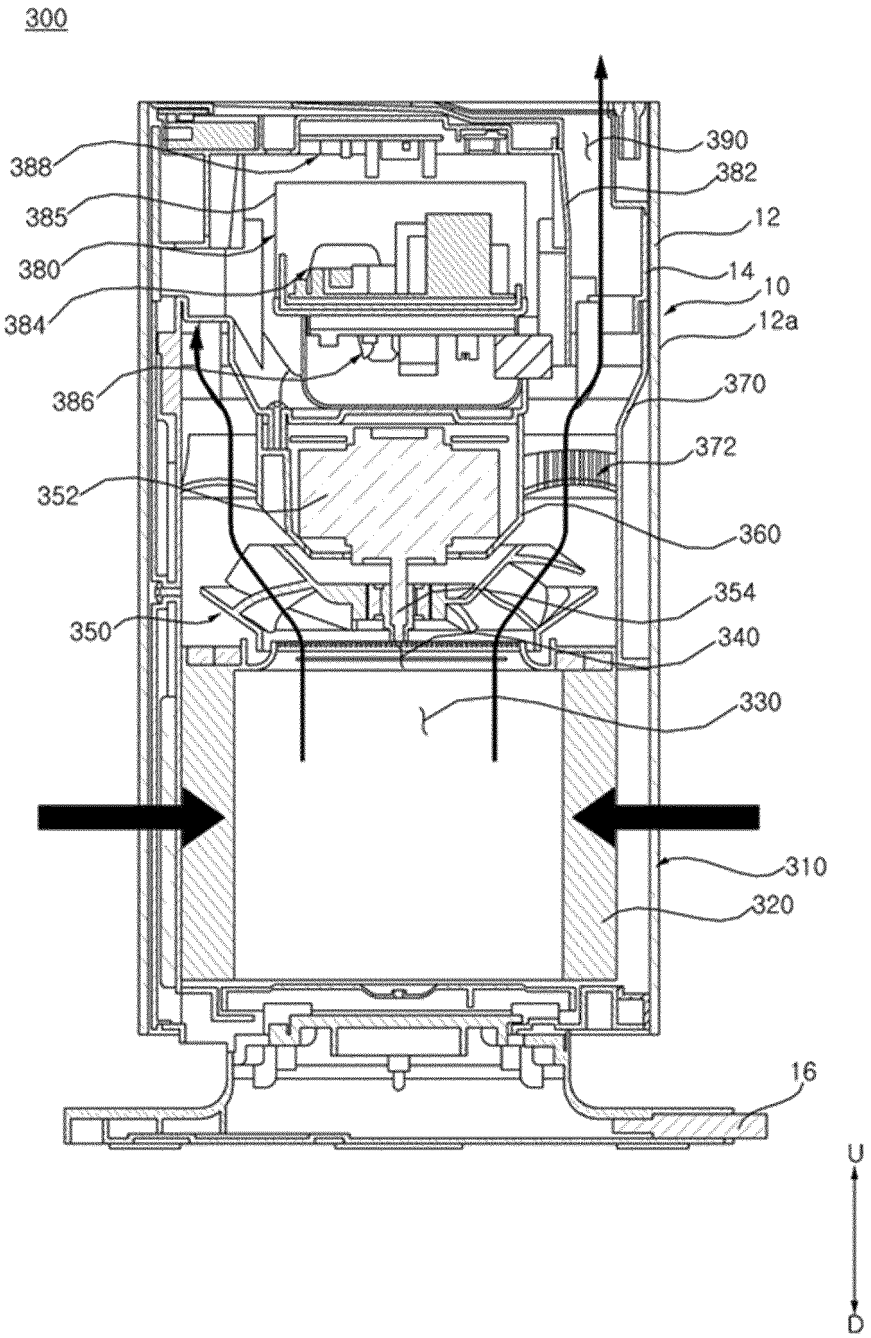

300
388
385
380
384
386
352
350
390
382
12
14
10
12a
370
372
360
354
340
330
310
320
16
U
D

FIG. 5

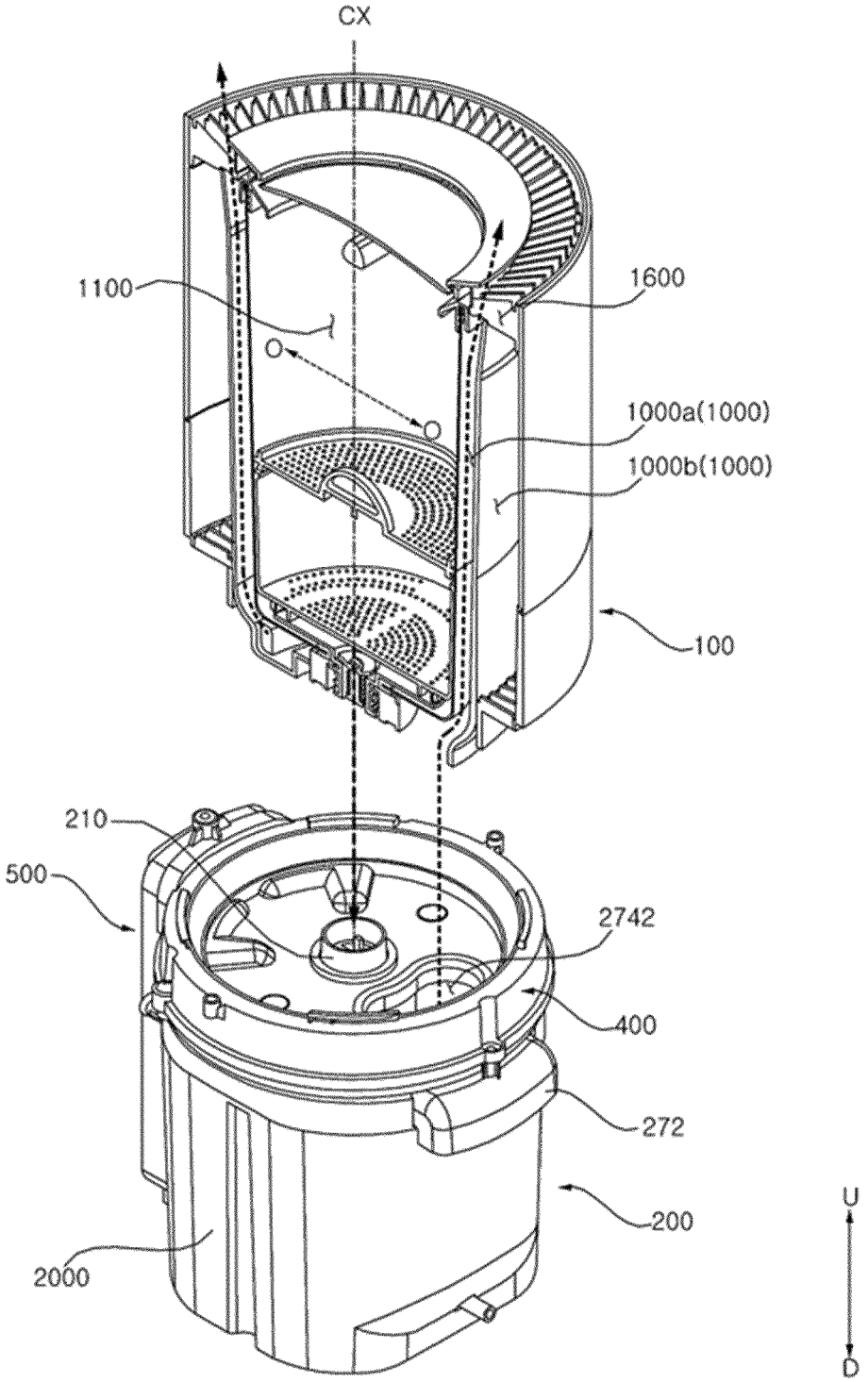

CX
1100
1600
1000a(1000)
1000b(1000)
100
210
500
2742
400
272
200
2000
U
D

FIG. 6

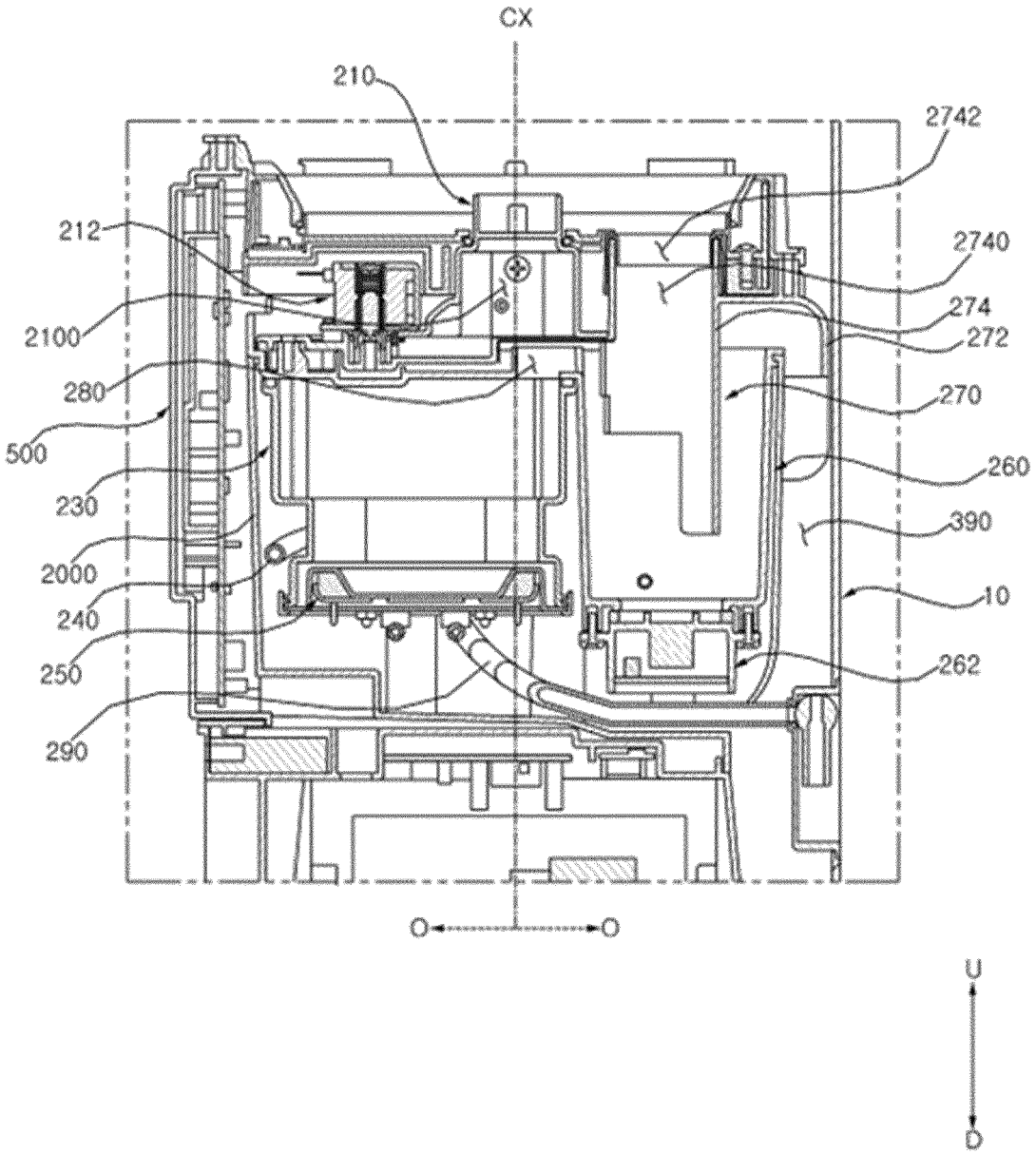

CX
210
2742
212
2740
274
2100
272
280
270
500
260
230
390
2000
10
240
262
250
290
O
O
U
D

FIG. 7

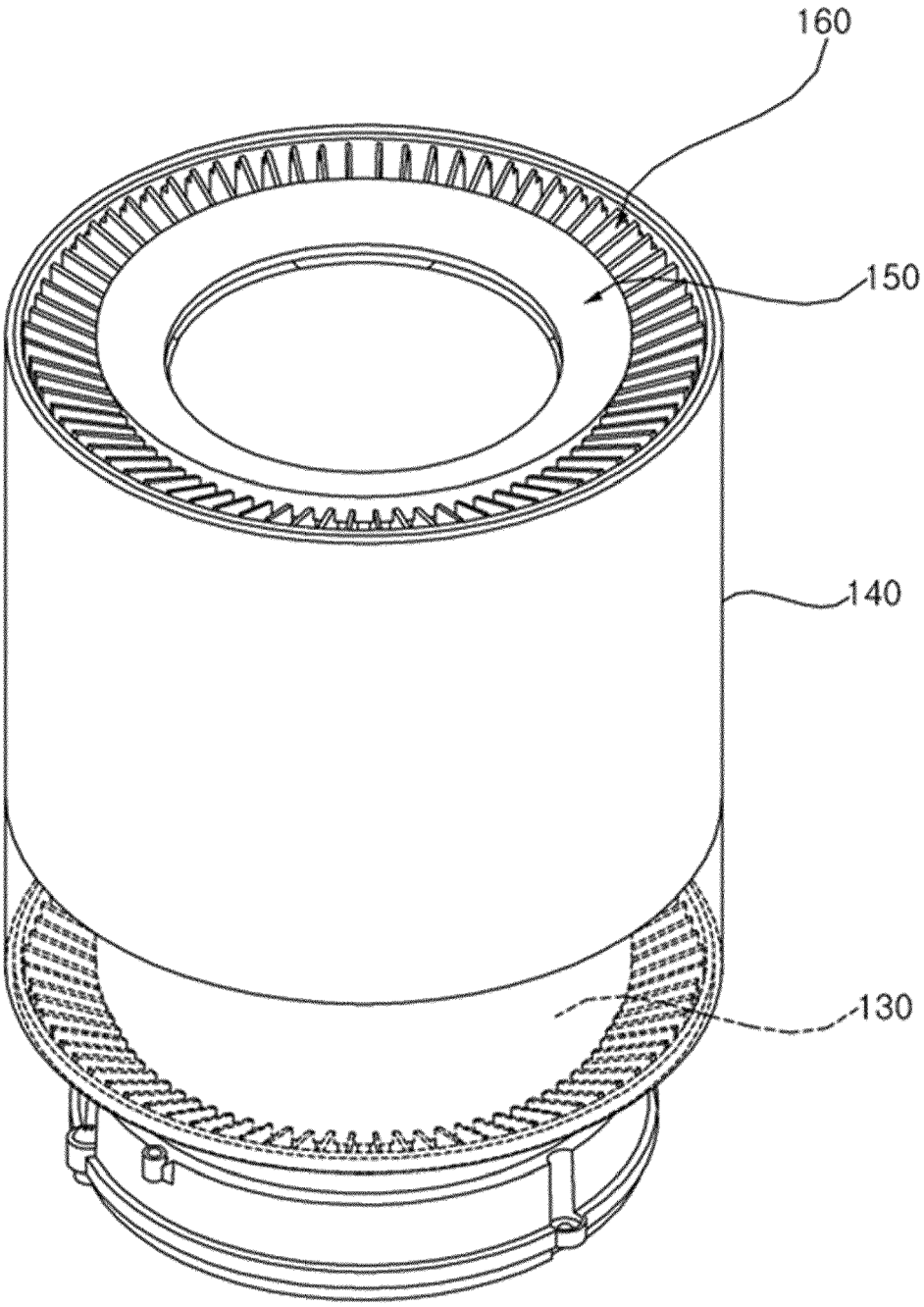


FIG. 8

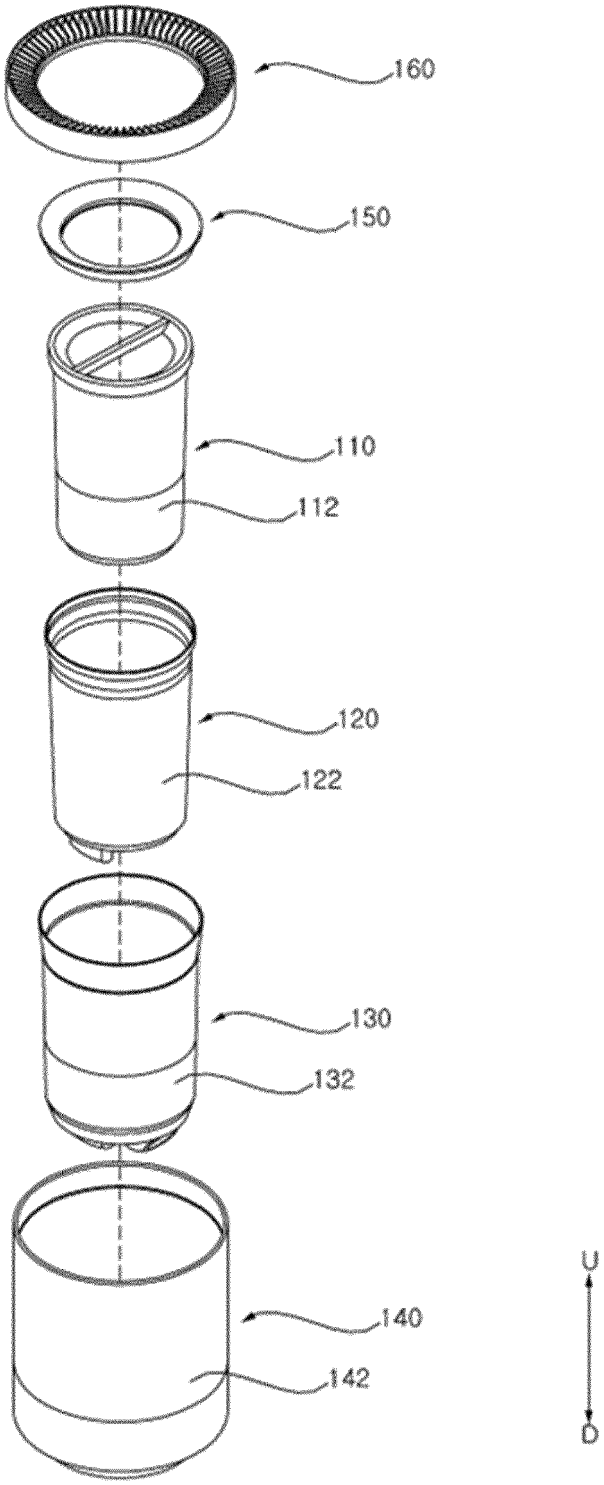


FIG. 9

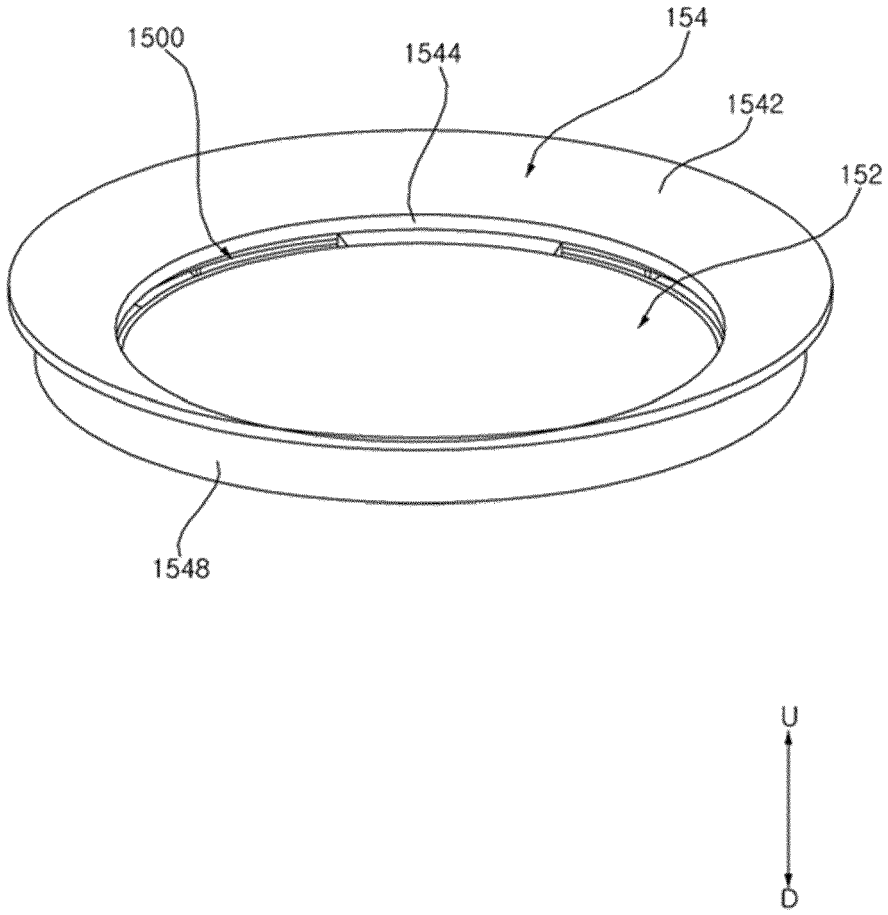


FIG. 10

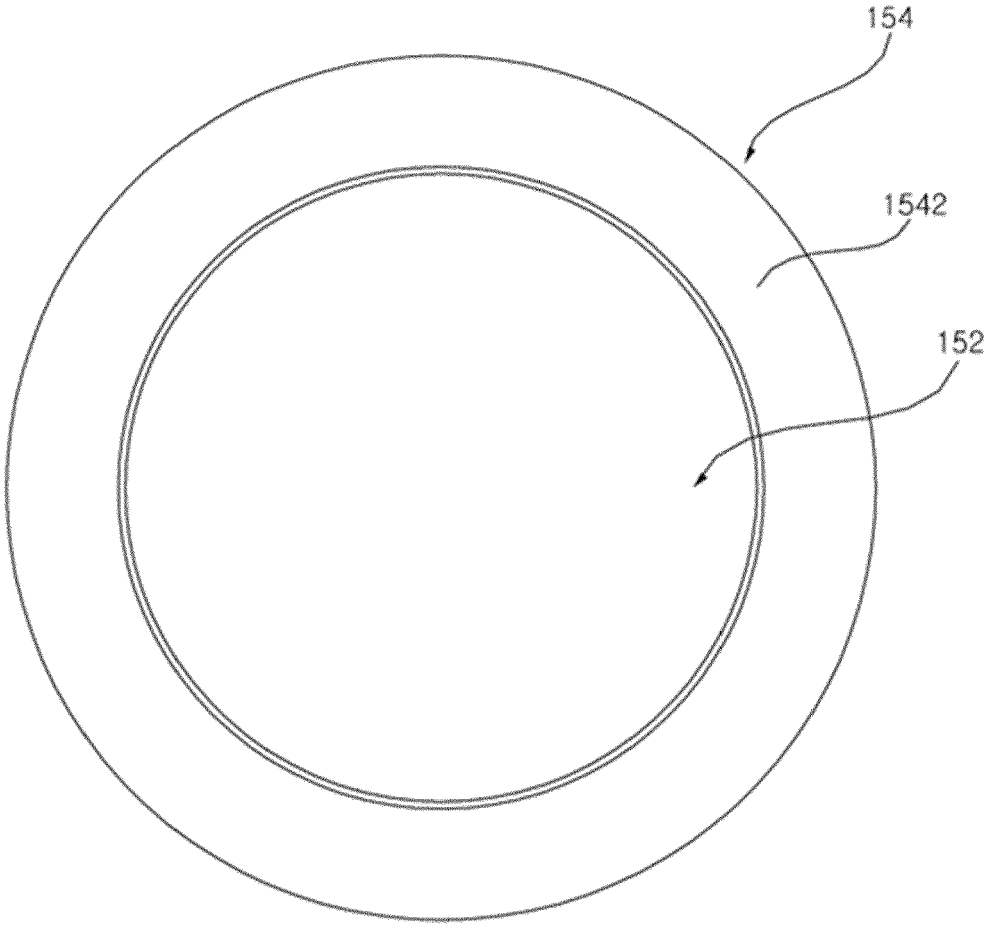


FIG. 11

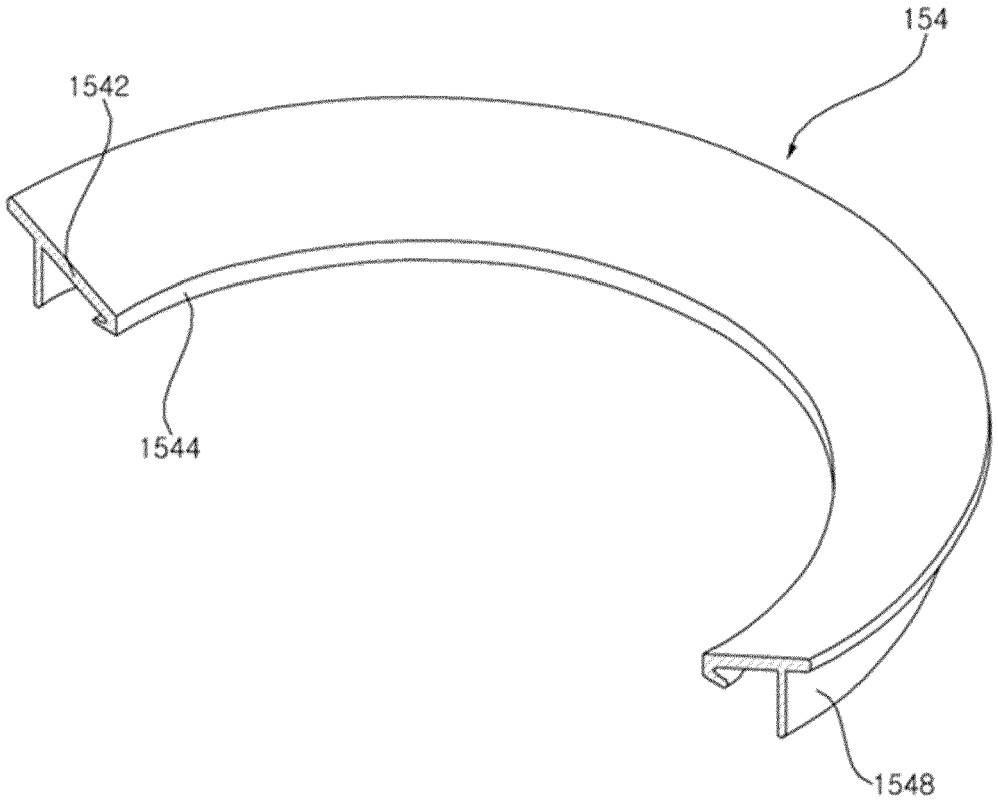


FIG. 12

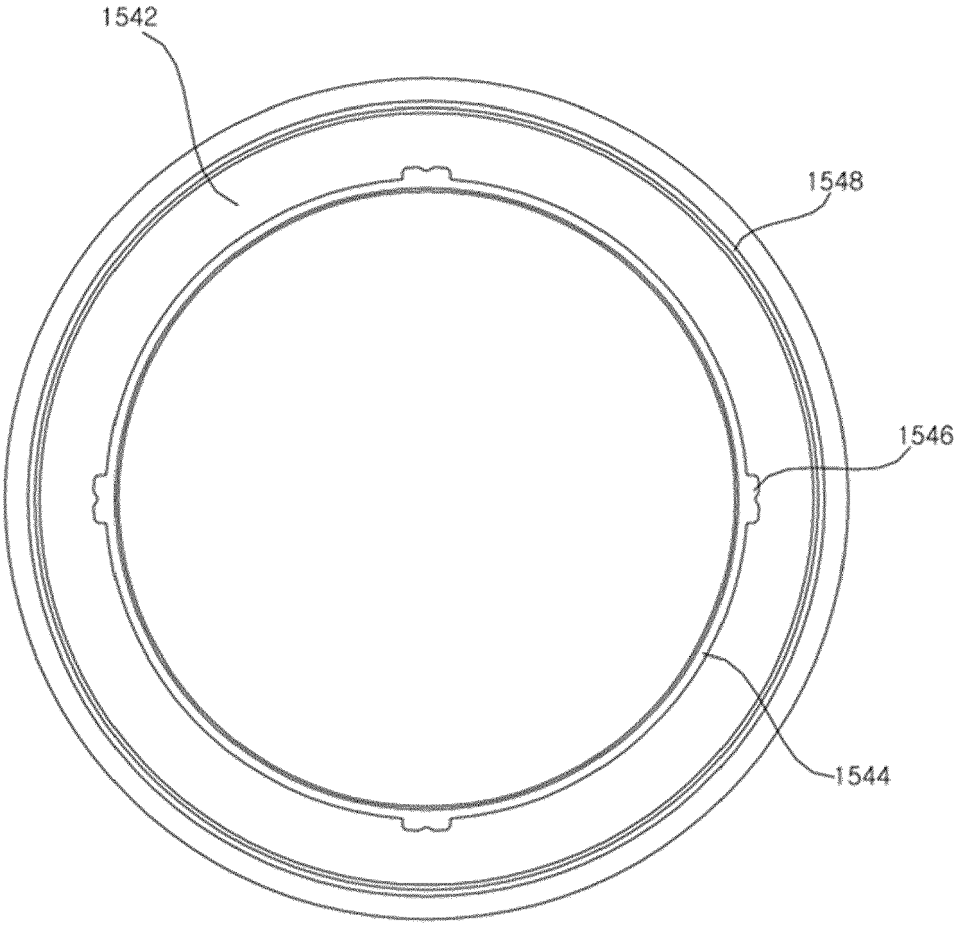


FIG. 13

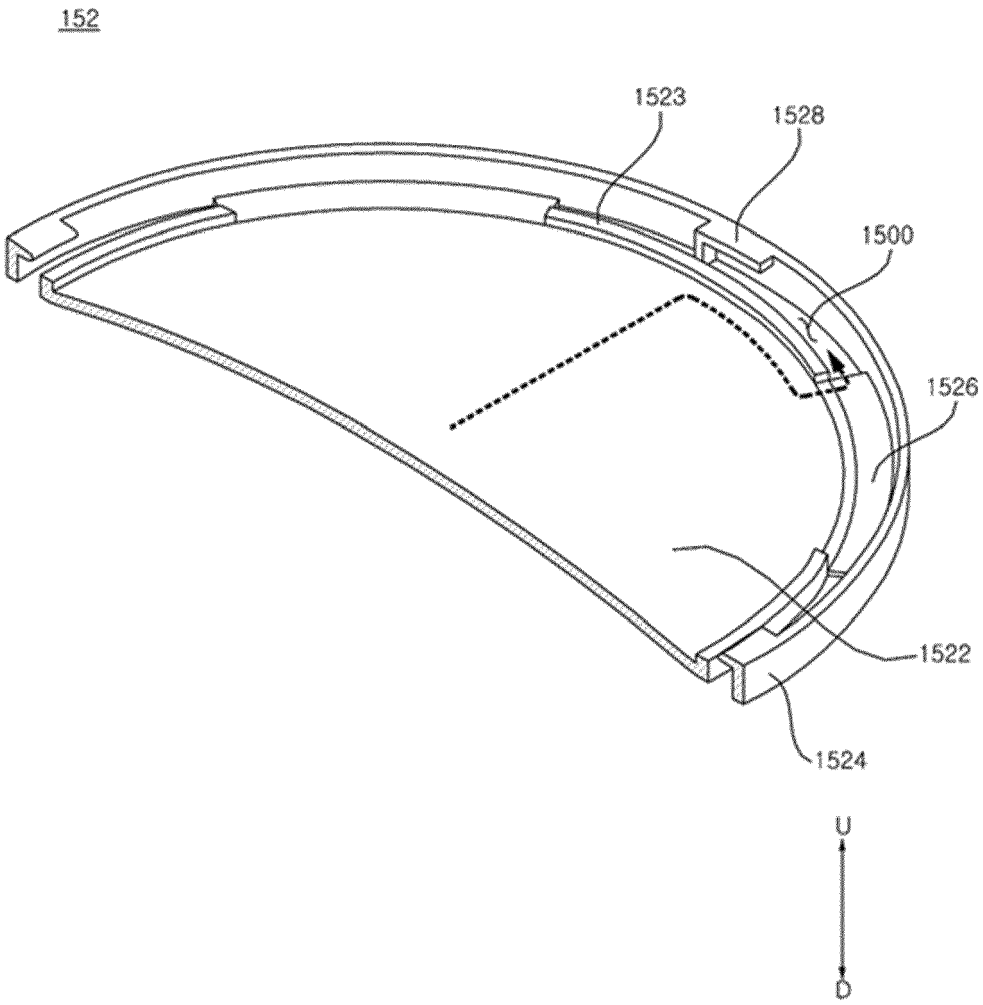


FIG. 14

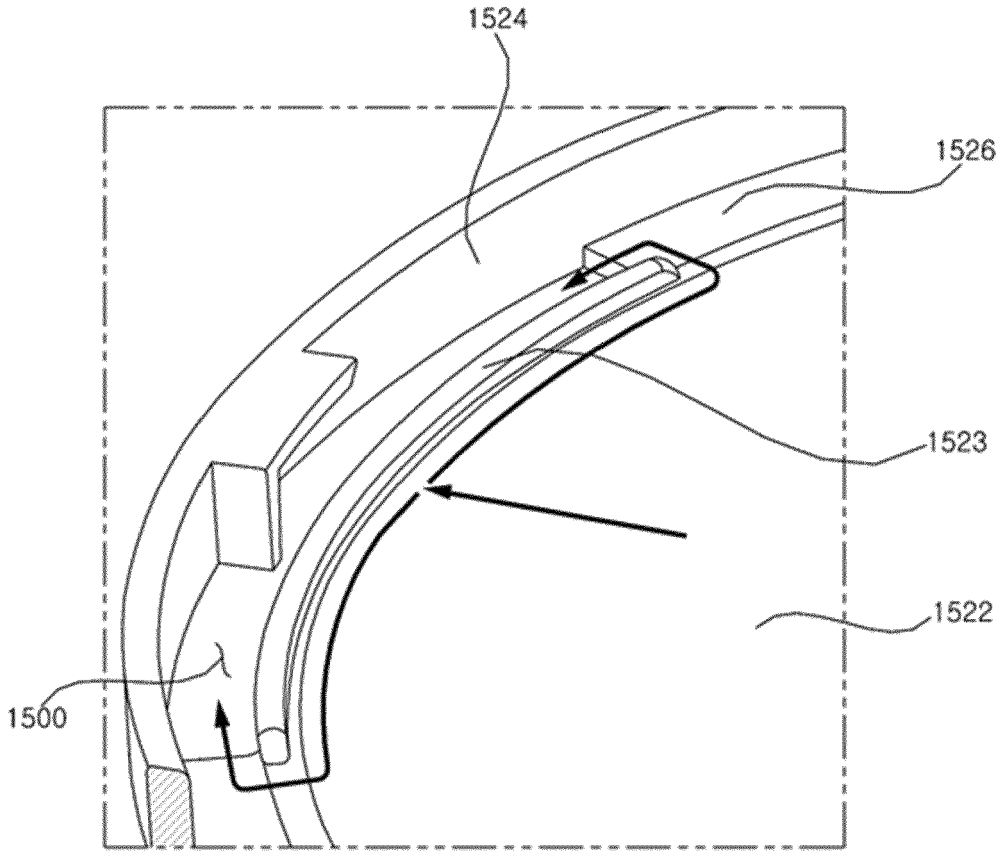


FIG. 15

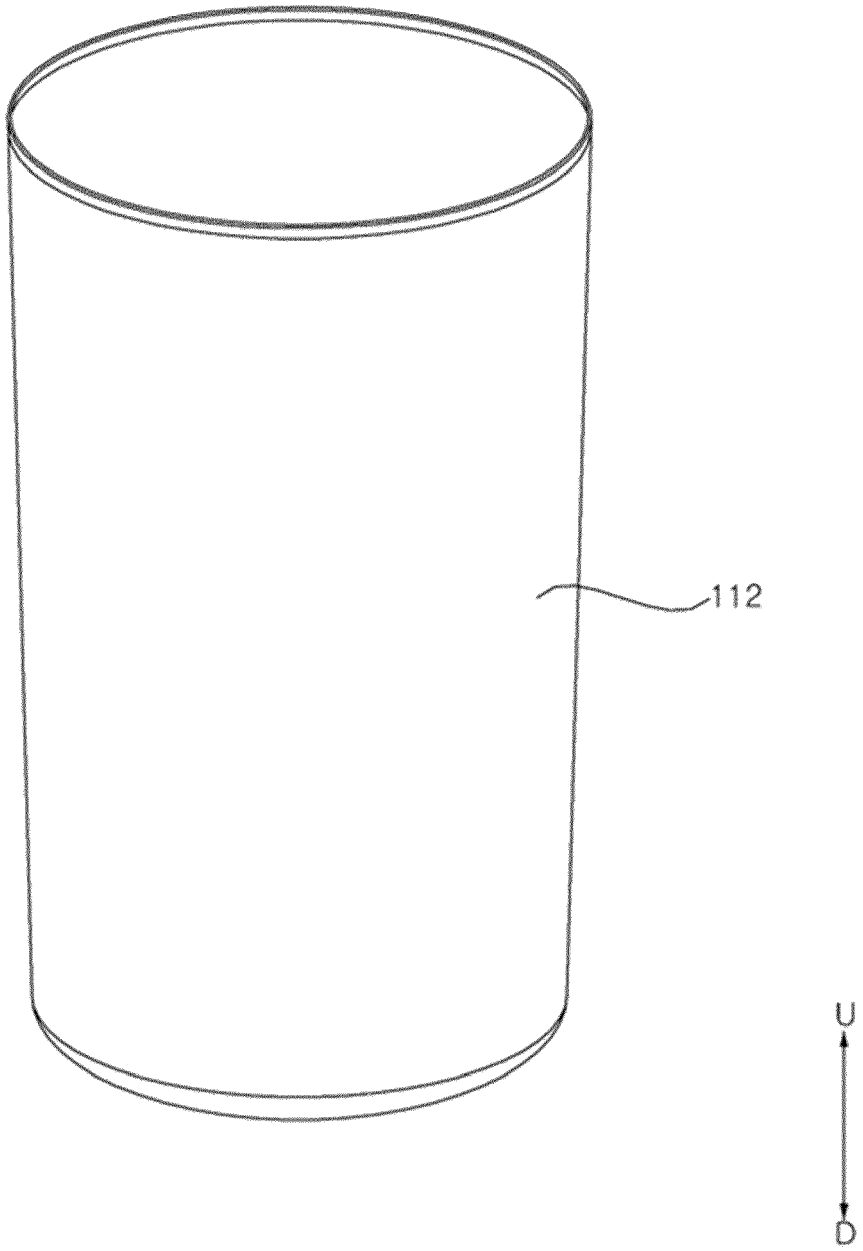


FIG. 16

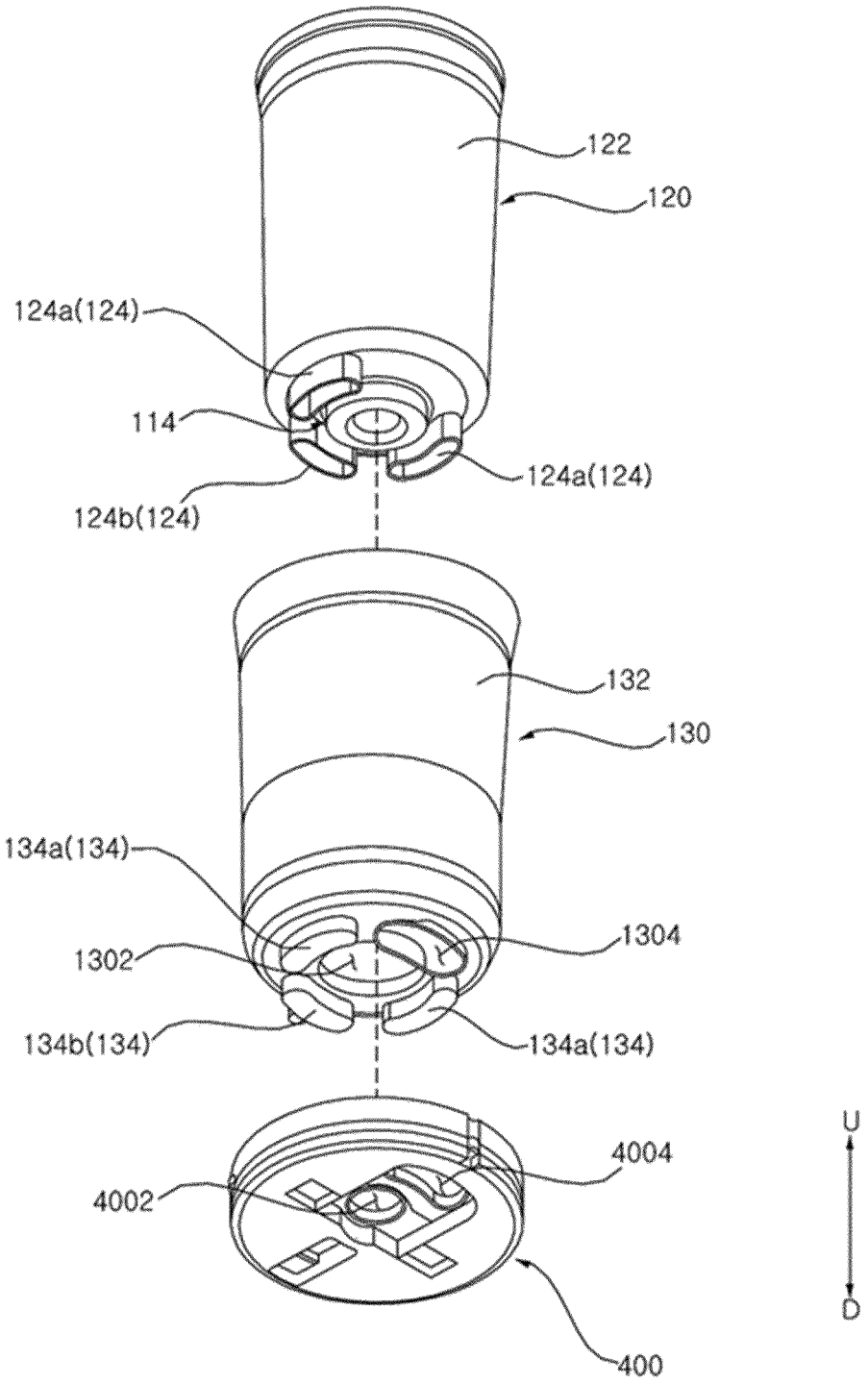

122
120
124a(124)
114
124a(124)
124b(124)
132
130
134a(134)
1304
1302
134b(134)
134a(134)
4004
4002
400
U
D

FIG. 17

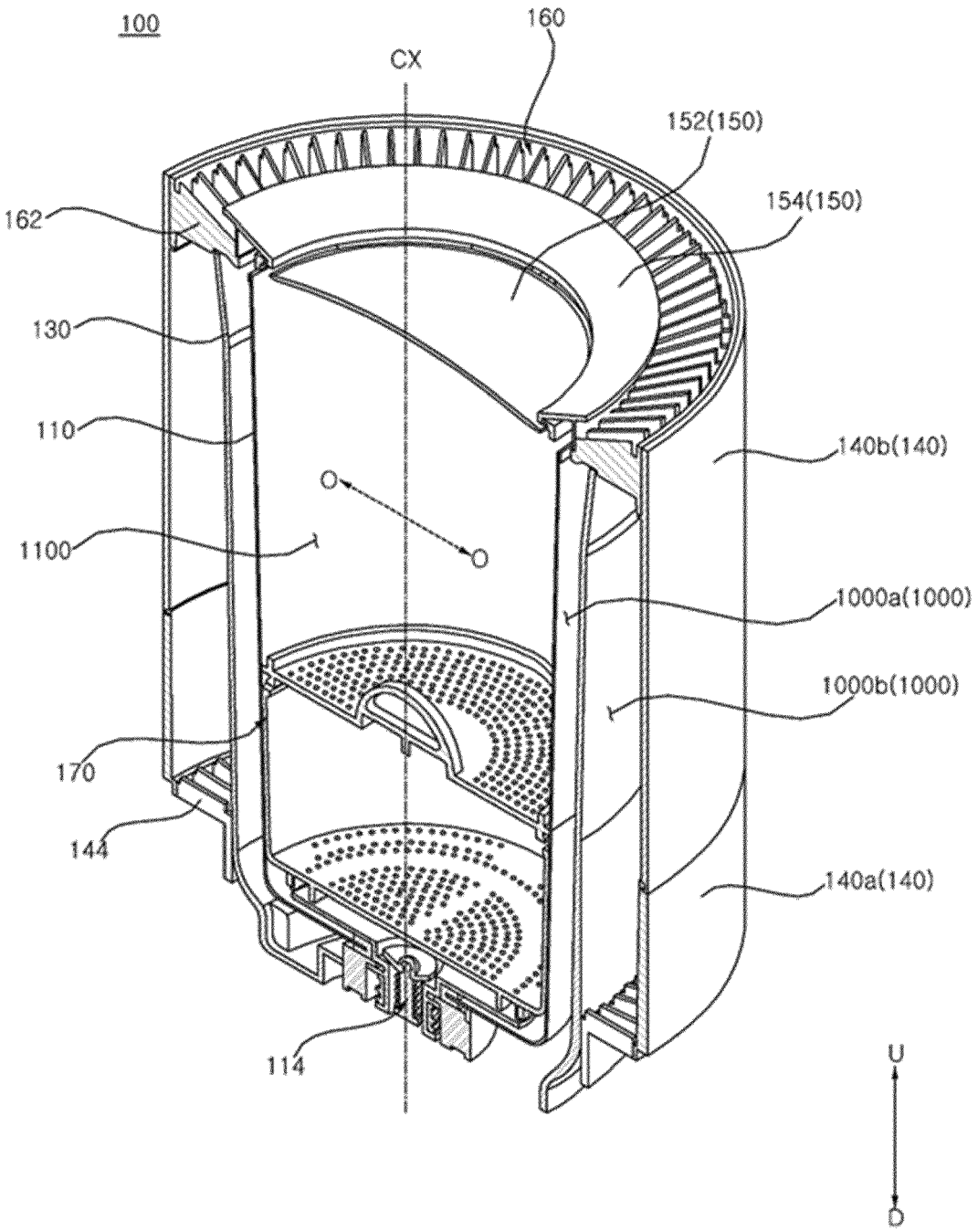
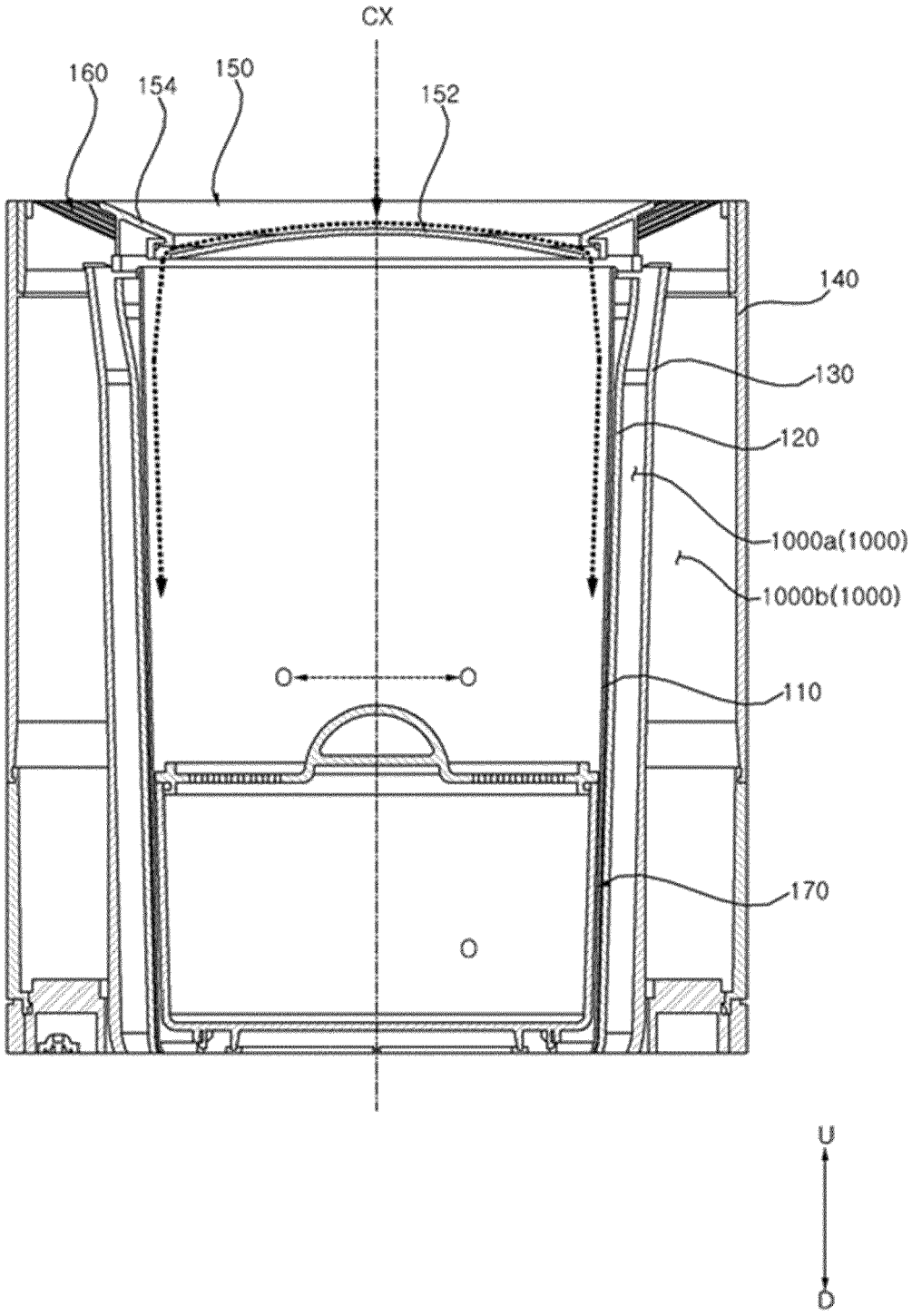

100
160
CX
152(150)
154(150)
162
130
110
140b(140)
O
O
1100
1000a(1000)
1000b(1000)
170
144
140a(140)
114
U
D

FIG. 18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152
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1000b(1000)
110
170
O
U
D

FIG. 19

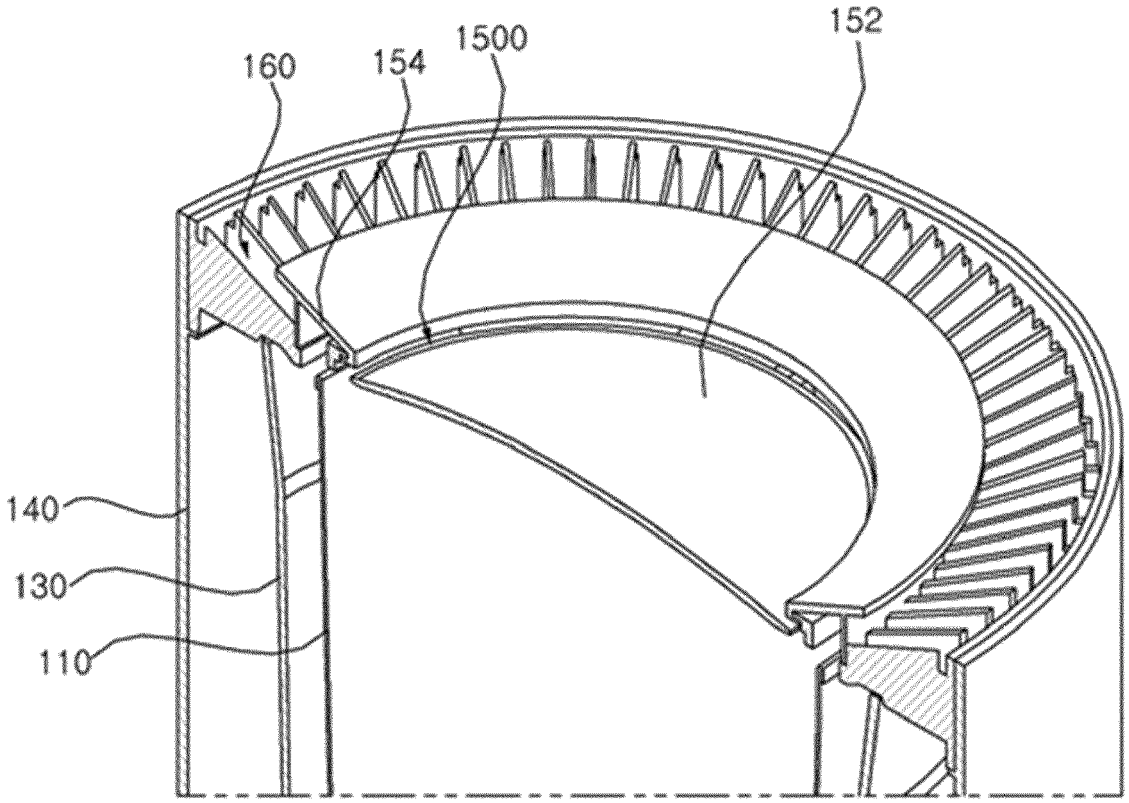


FIG. 20

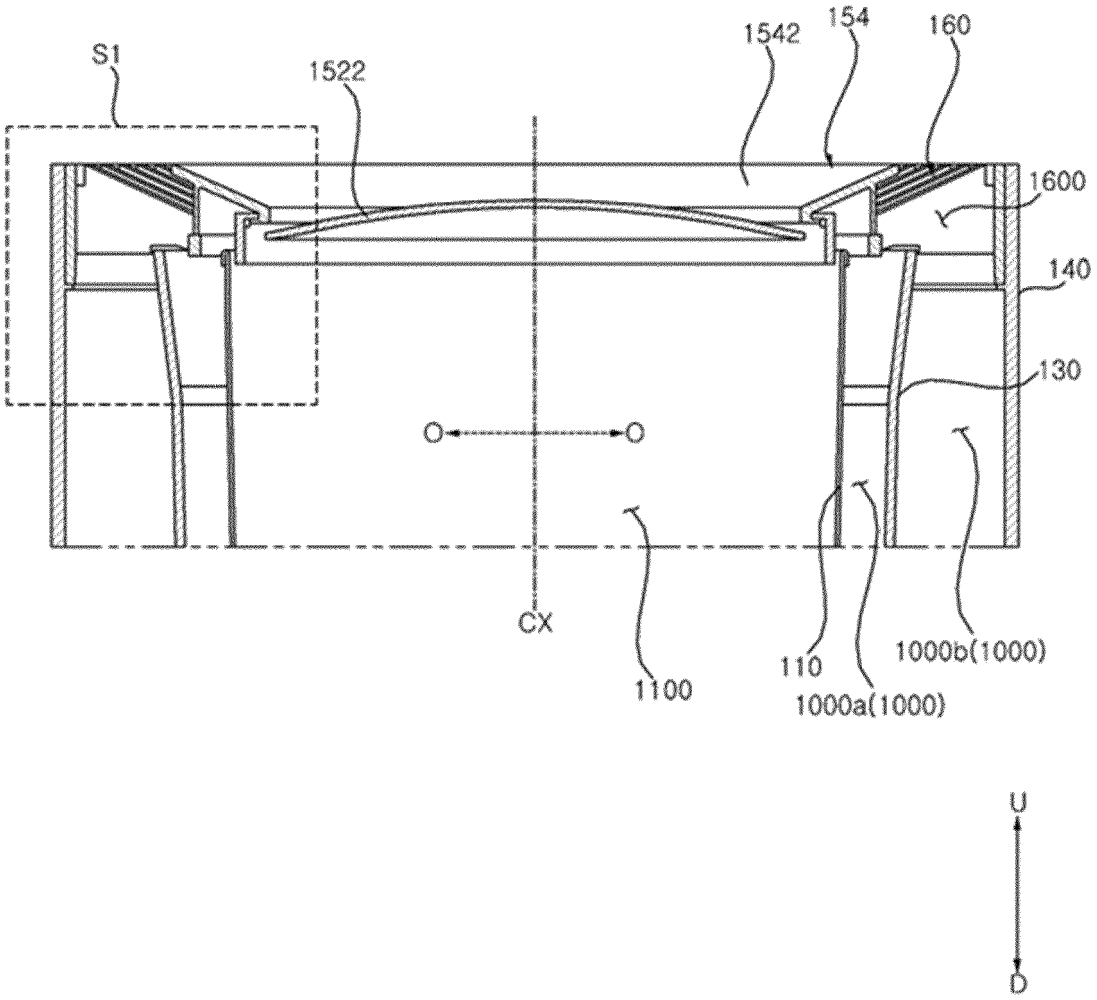
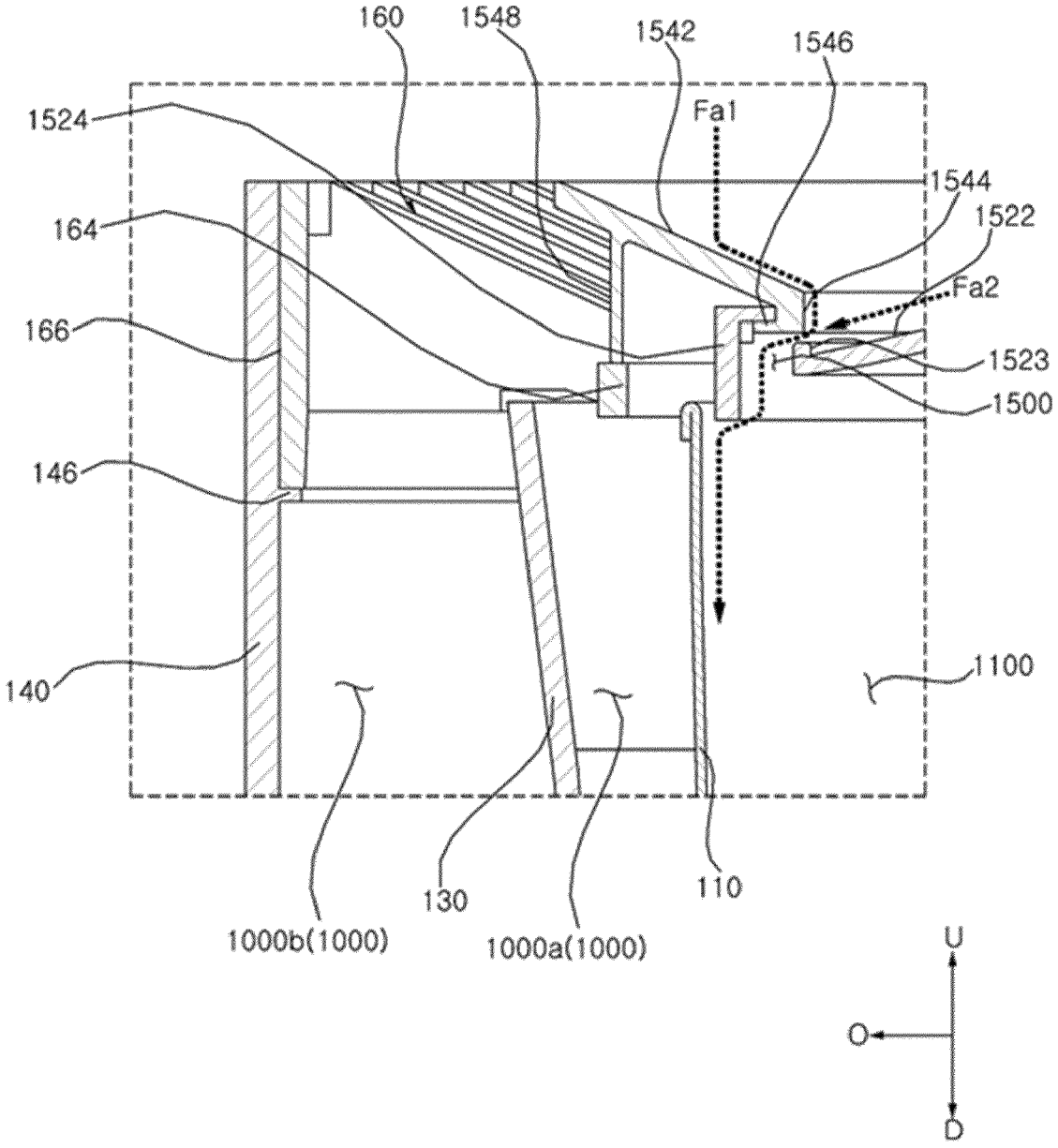

S1
1522
1542
154
160
1600
140
130
O
O
CX
1100
110
1000a(1000)
1000b(1000)
U
D

FIG. 21


160
1548
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1546
1524
Fa1
1544
1522
164
Fa2
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1523
1500
146
140
1100
130
110
1000b(1000)
1000a(1000)
U
O
D

FIG. 22

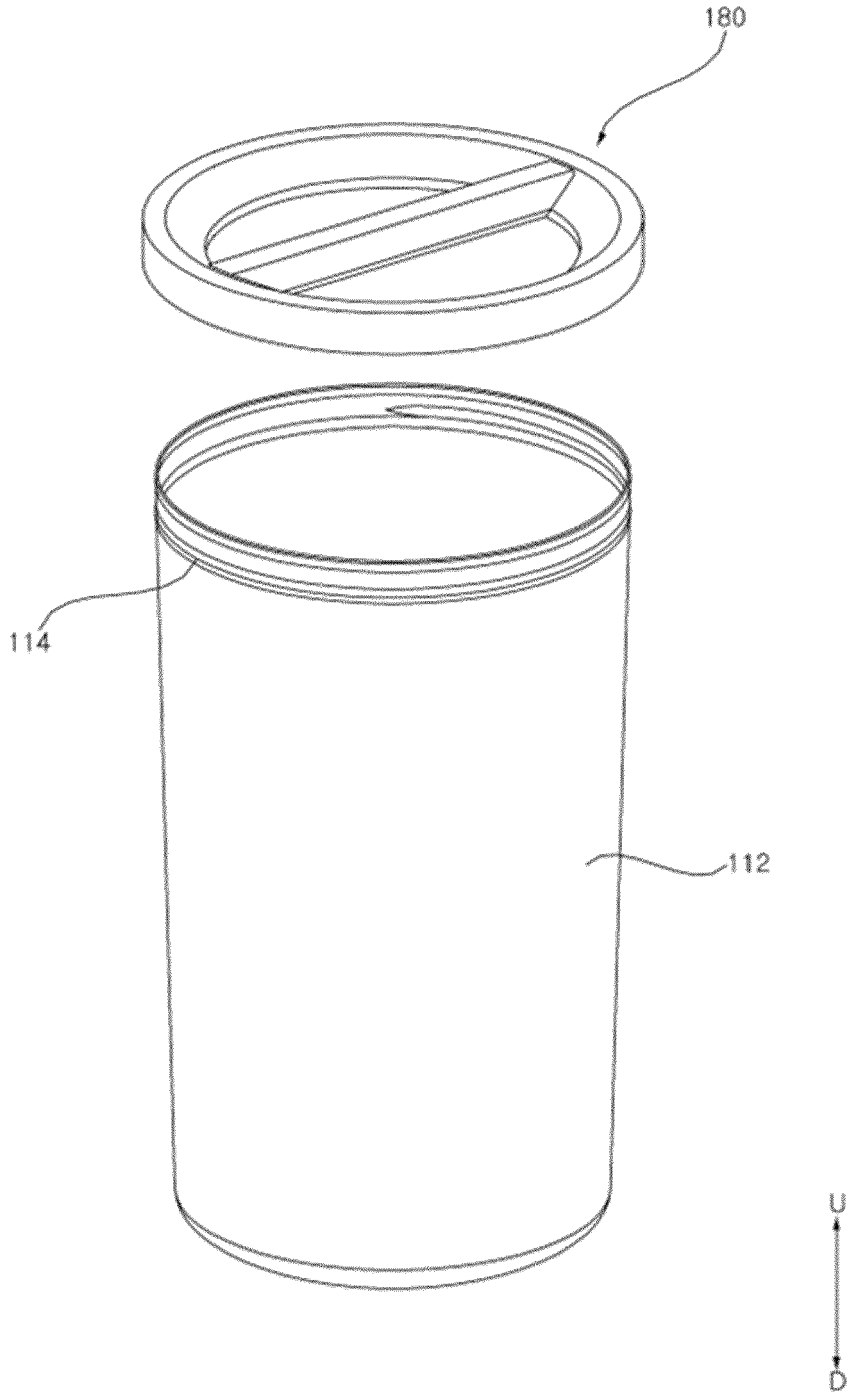


FIG. 23

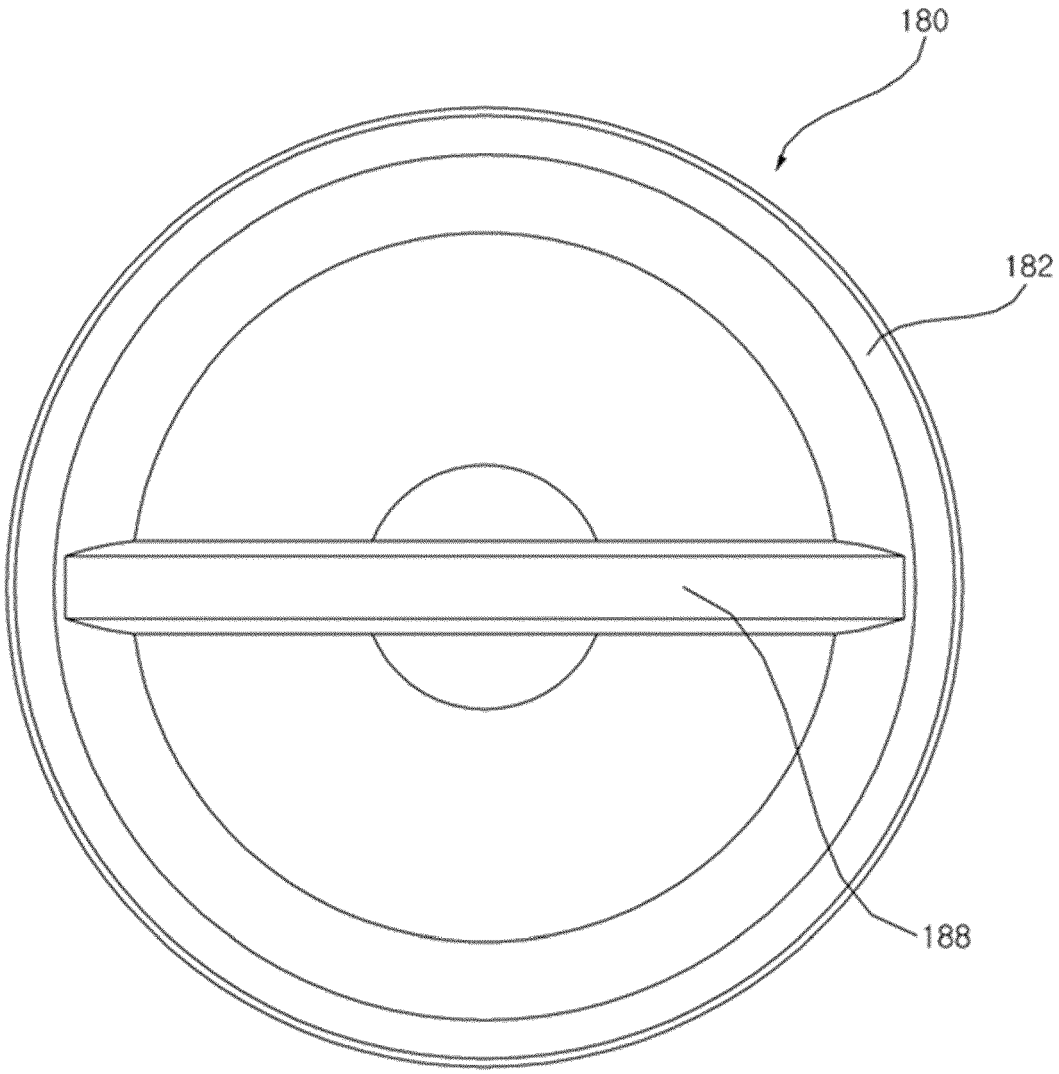
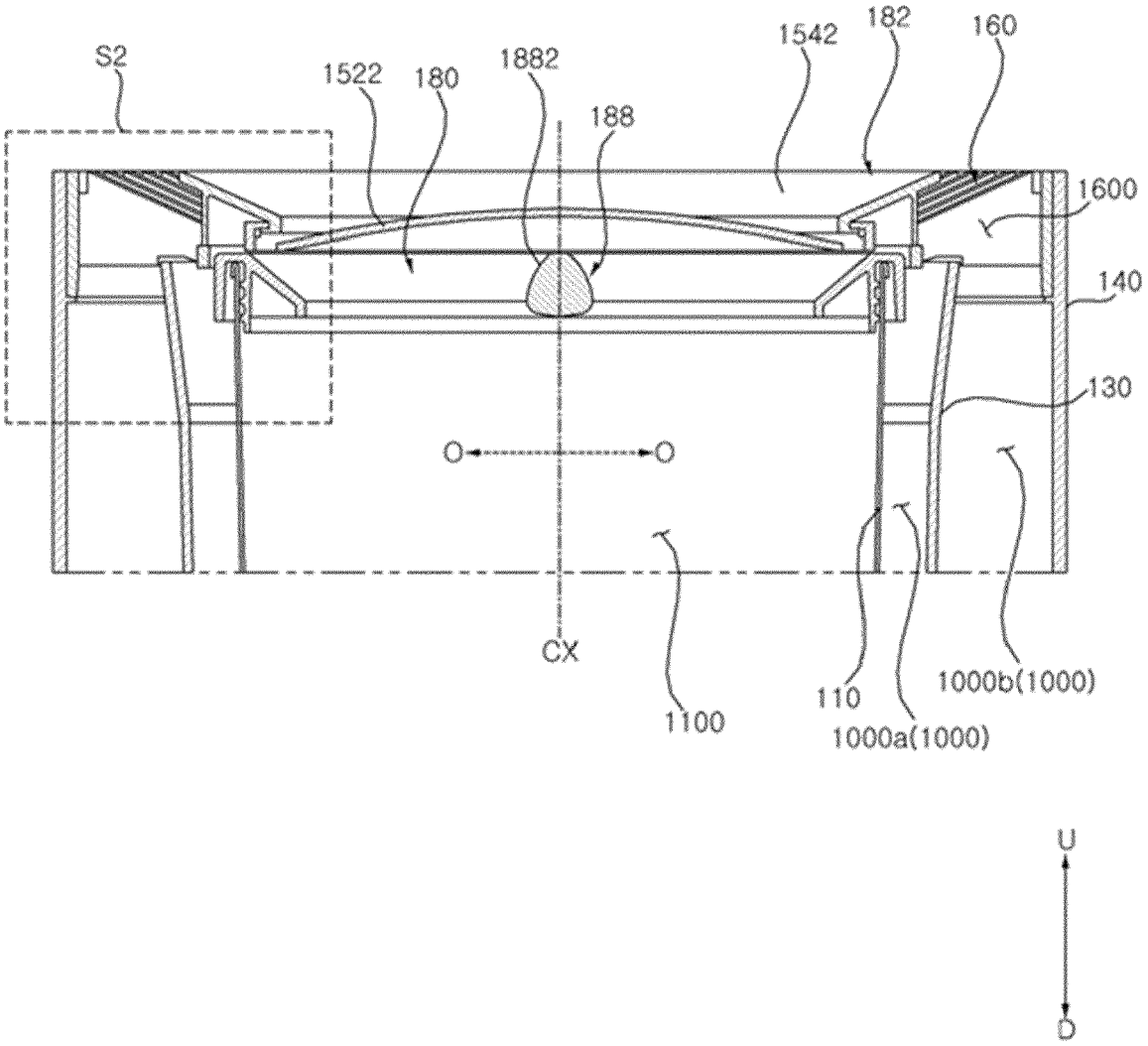


FIG. 24


S2
1522
180
1882
188
1542
182
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1600
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130
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O
CX
1100
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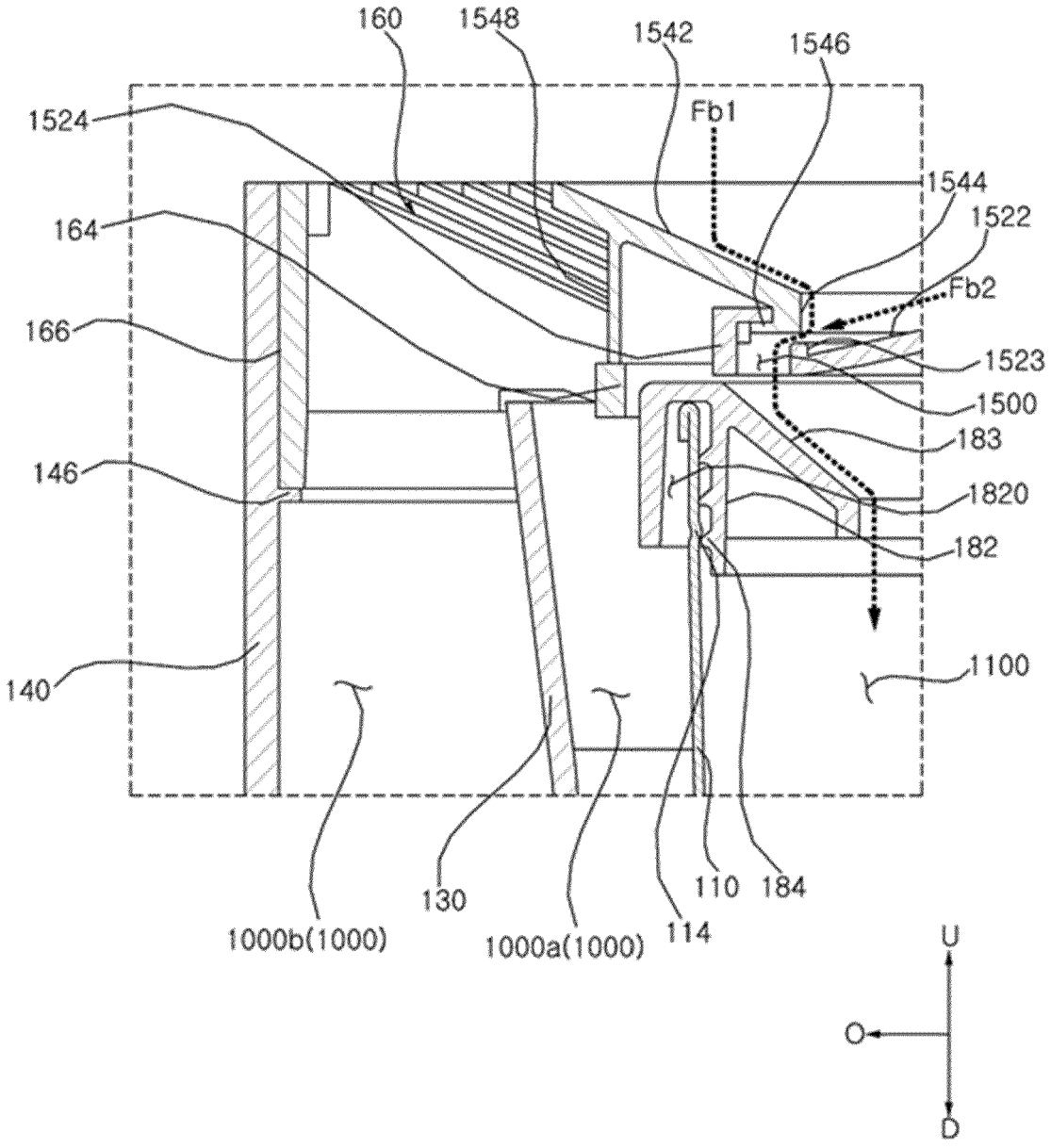
1000a(1000)
1000b(1000)
U
D

FIG. 25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1546
1524
Fb1
1544
1522
164
Fb2
166
1523
1500
183
146
1820
182
1100
140
130
110
184
1000b(1000)
1000a(1000)
114
U
O
D

FIG. 26

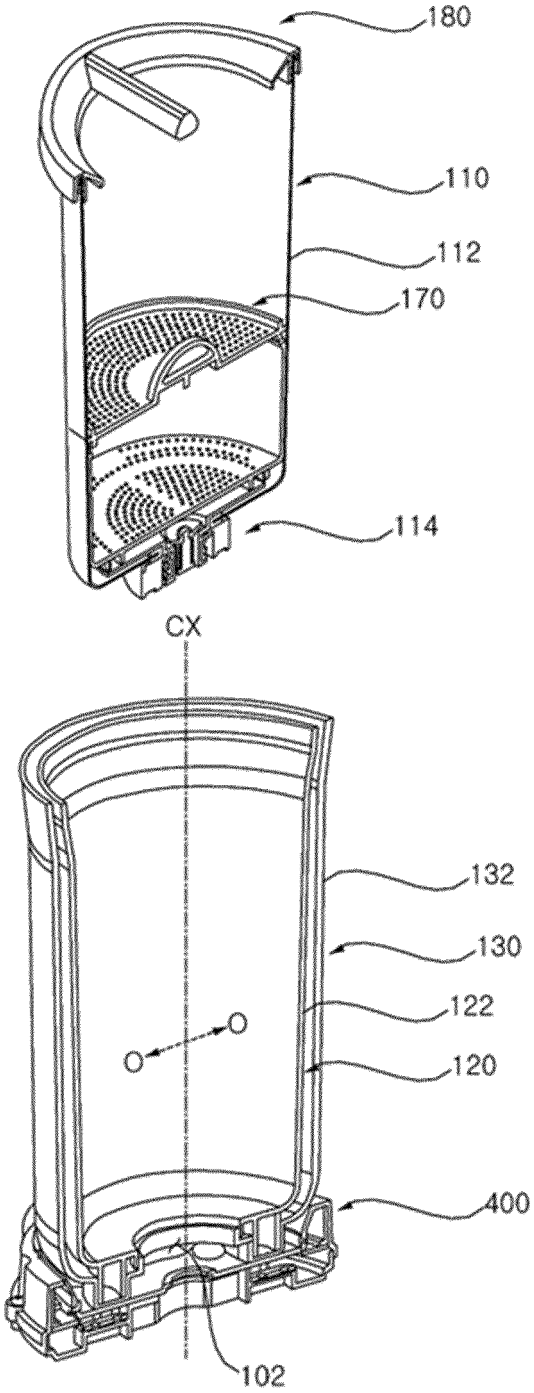


FIG. 27

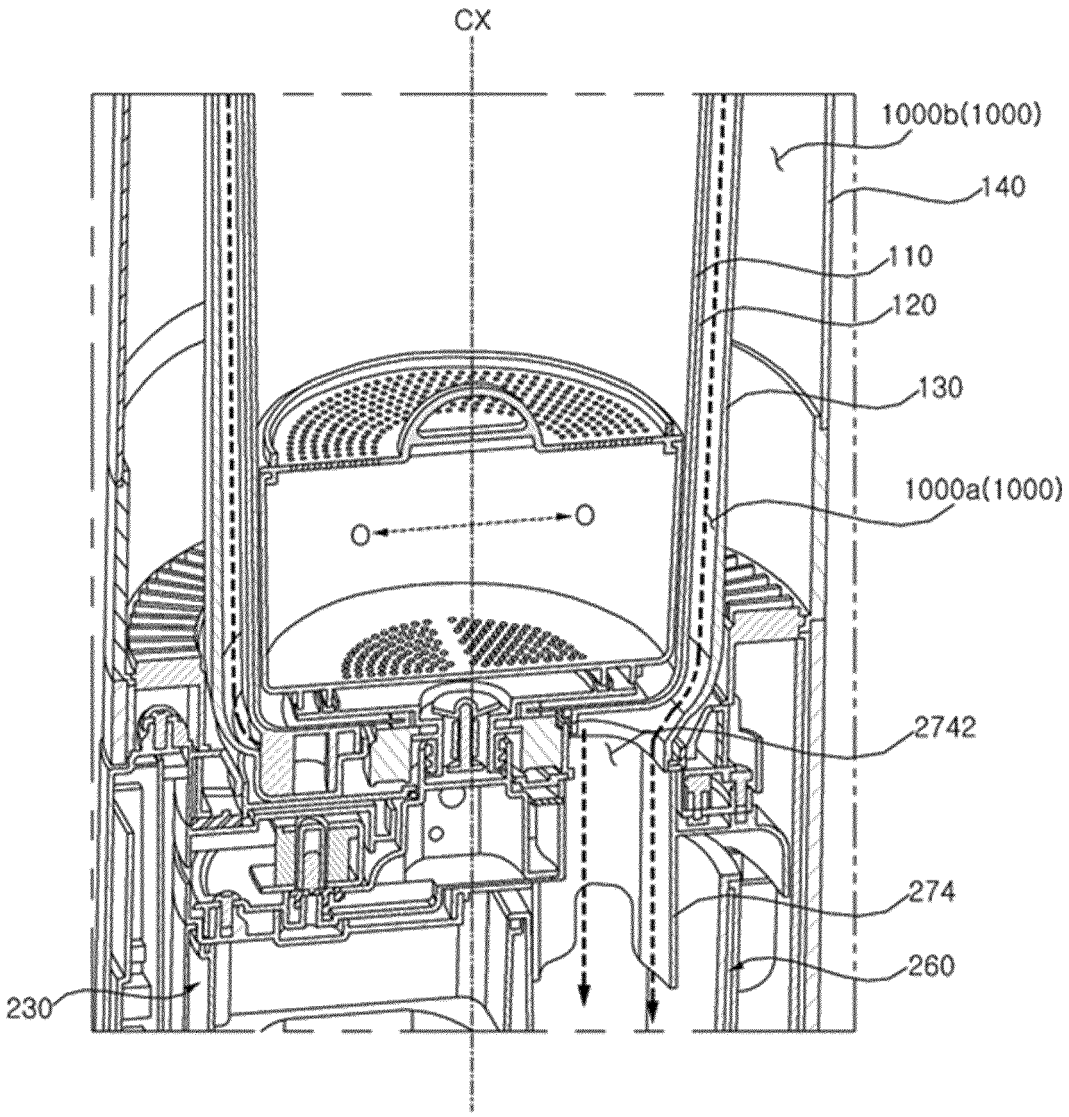


FIG. 28

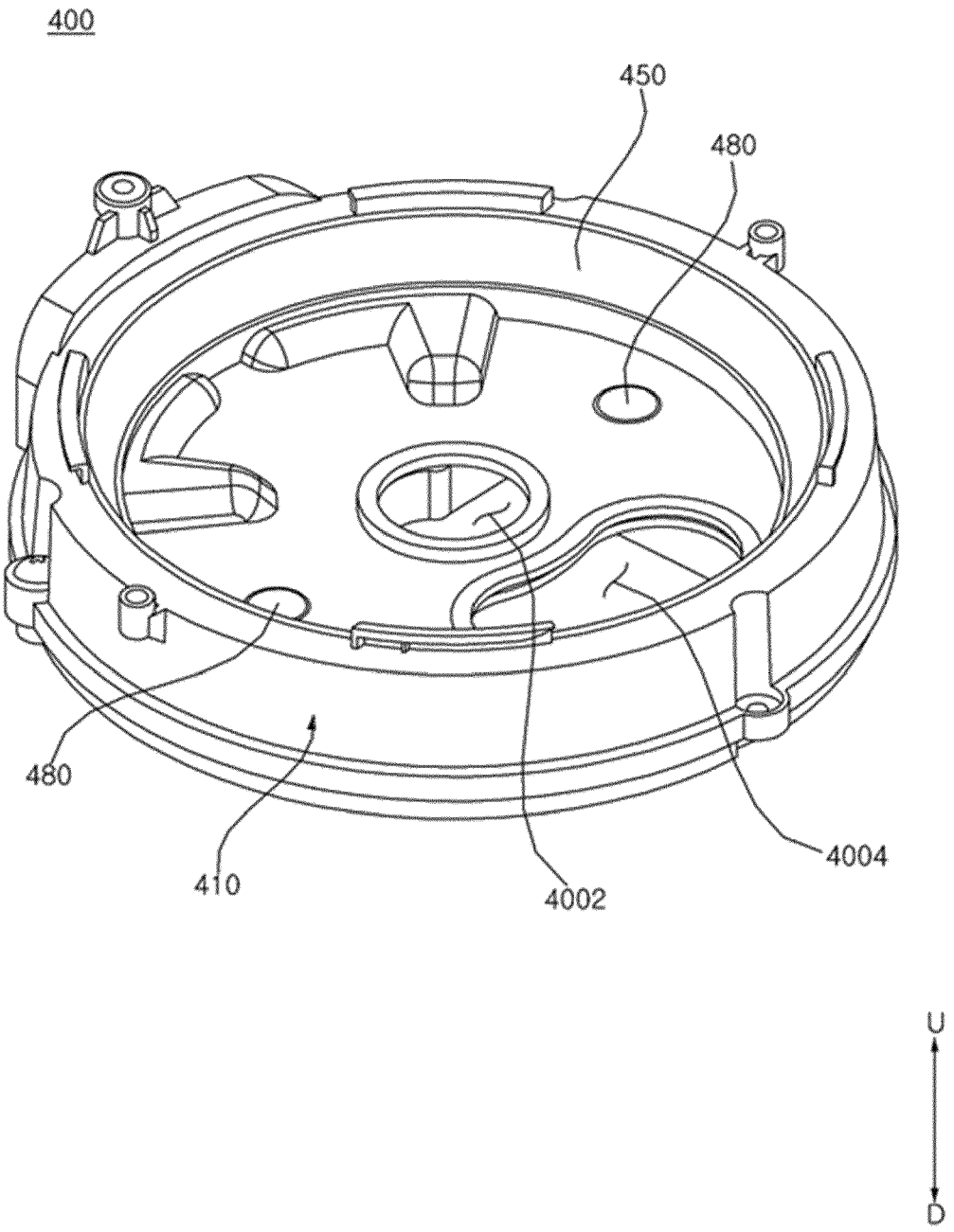


FIG. 29

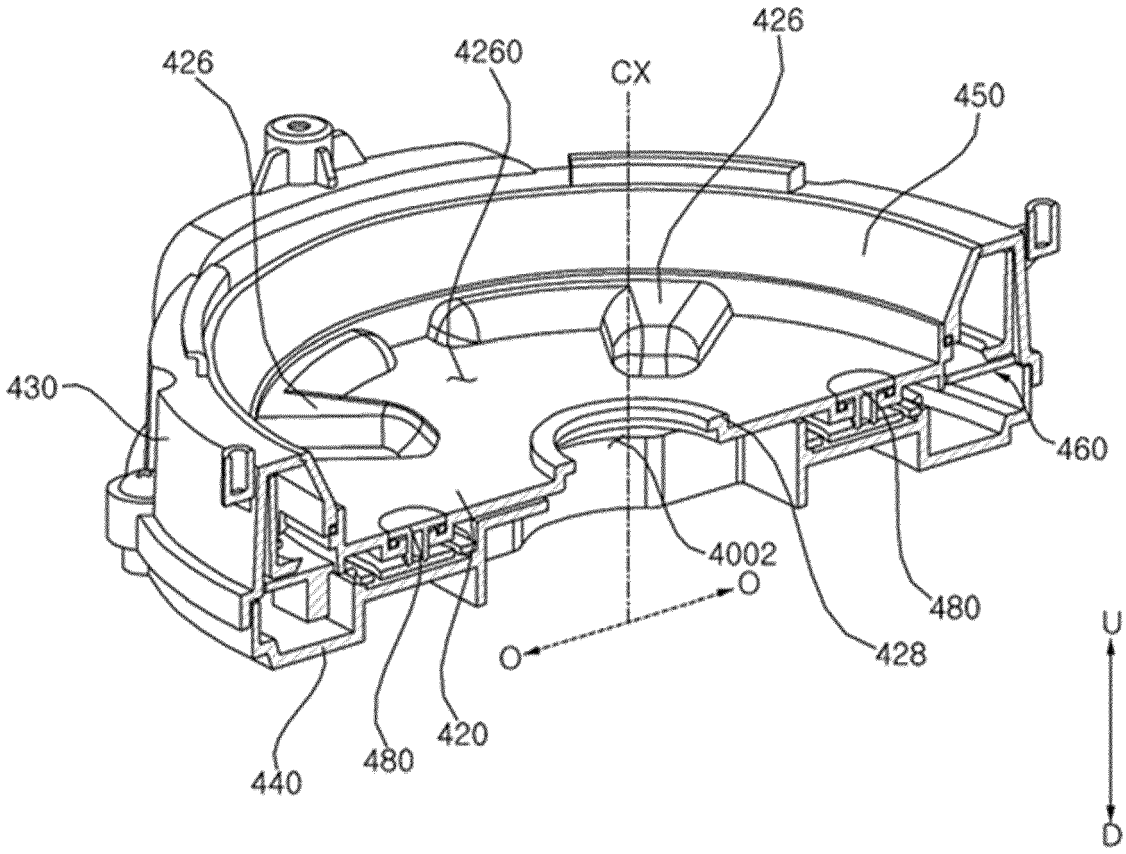
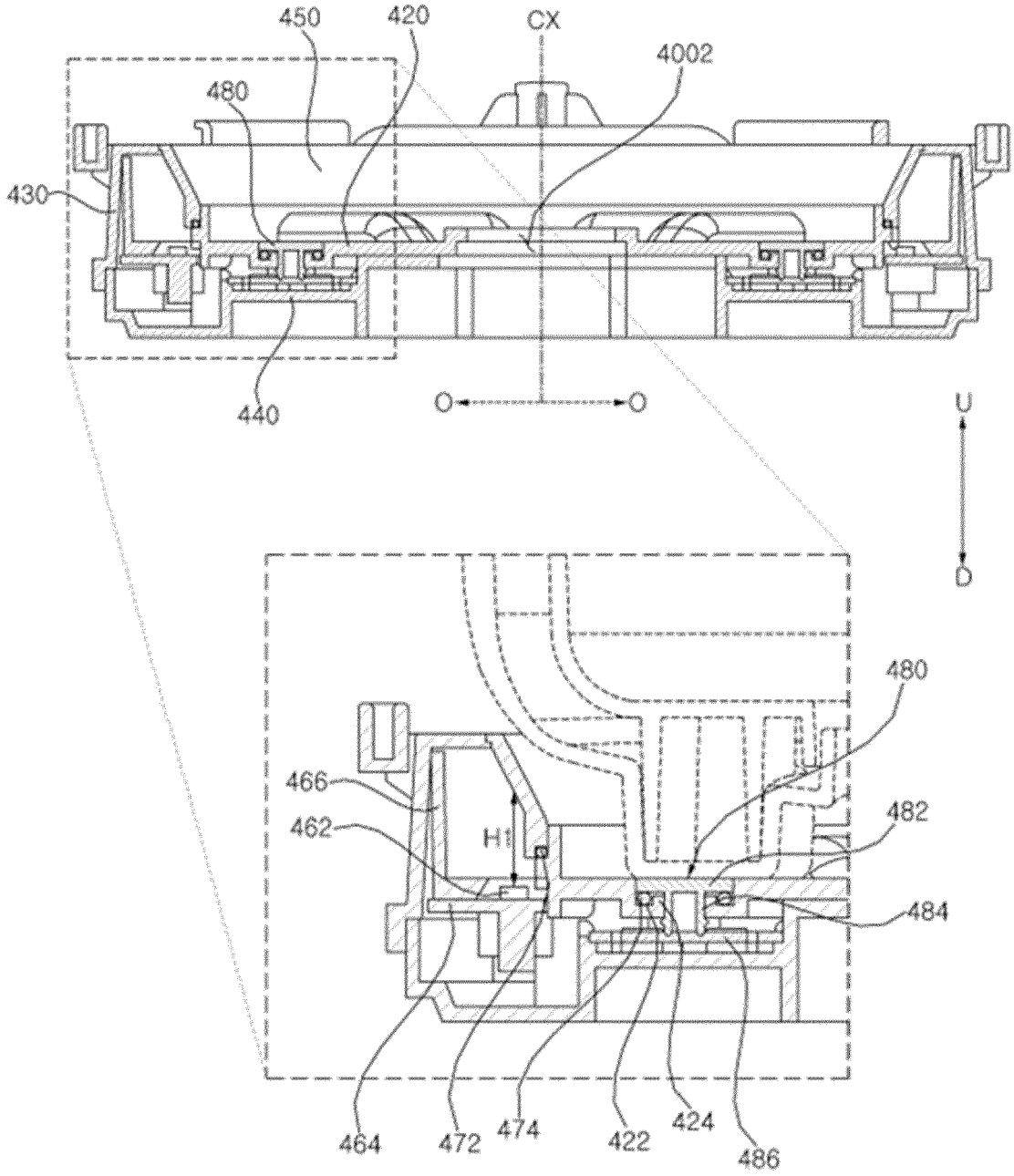


FIG. 30


450
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O
O
U
D
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H1
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484
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472
474
422
424
486

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EUROPEAN SEARCH REPORT

Application Number
EP 24 17 2326

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 2021/172627 A1 (JUNG JAEHYUK [KR] ET AL) 10 June 2021 (2021-06-10) * paragraph [0075] - paragraph [0131] * * figures *	1-12,14,15 13	INV. F24F6/02
X	US 2017/122596 A1 (LEE KUNYOUNG [KR] ET AL) 4 May 2017 (2017-05-04) * paragraph [0145] - paragraph [0221] * * figures *	1	
X	AU 2021 100 039 A4 (SHENZHEN THOUSANDSHORES TECHNOLOGY CO LTD [CN]) 15 April 2021 (2021-04-15) * paragraph [0031] - paragraph [0035] * * figures *	1	
X	EP 2 860 464 A1 (BALMUDA CO LTD [JP]) 15 April 2015 (2015-04-15) * paragraph [0005] - paragraph [0009] * * paragraph [0033] - paragraph [0037] * * figures *	1	TECHNICAL FIELDS SEARCHED (IPC)
X	KR 102 264 454 B1 (SEO YONG HO [KR]) 14 June 2021 (2021-06-14) * paragraph [0010] - paragraph [0031] * * figures *	1	F24F
Y	US 2021/222895 A1 (BAE JUNSEOK [KR] ET AL) 22 July 2021 (2021-07-22) * paragraph [0197] - paragraph [0228] * * figure 10 *	13	
A	US 2023/012780 A1 (WANG CHI HSIANG [CA] ET AL) 19 January 2023 (2023-01-19) * abstract; figures *	1	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	9 September 2024	Mattias Grenbäck

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 24 17 2326

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Place of search	Date of completion of the search	Examiner
Munich	9 September 2024	Mattias Grenbäck

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