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(71) Applicant: **LG Electronics Inc.**
Yeongdeungpo-gu
Seoul 07336 (KR)

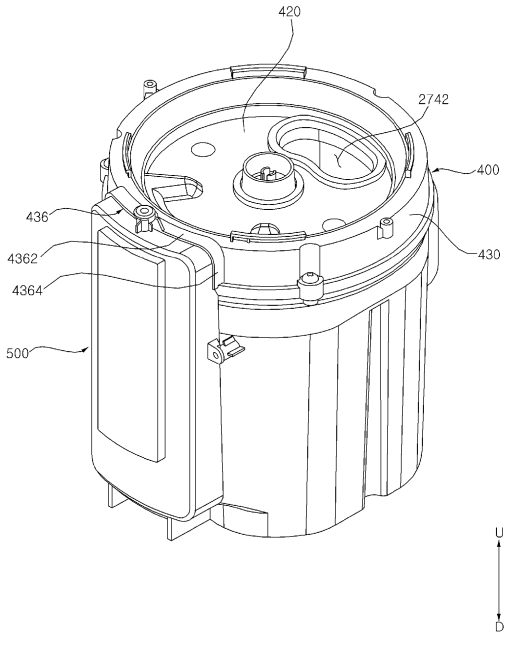
(72) Inventors:
- **JEONG, Wonjun**
  08592 Seoul (KR)
- **KU, Myungjin**
  08592 Seoul (KR)
- **LEE, Kunyoung**
  08592 Seoul (KR)
- **JEON, Jihye**
  08592 Seoul (KR)

(74) Representative: **Vossius & Partner**
Patentanwälte Rechtsanwälte mbB
Siebertstrasse 3
81675 München (DE)

(54) **HUMIDIFIER**

(57) The present invention relates to humidifier. The humidifier of the present invention includes a humidifying device which generates humidified air; a display coupled to one side of the humidifying device, wherein the display includes: a display housing which is open toward the humidifying device; and a display substrate which is installed inside the display housing, wherein the humidifying device includes a coupling cover which extends in an outward direction, and covers the display housing.

FIG. 10



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Description

[0001] This invention relates to a humidifier, and more particularly, to a humidifier having a waterproof structure applied to a display.

[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 'upward discharge type large-capacity humidifier' disclosed in Korean Patent No. 10-2500340 includes a water tank for storing water; and a main body that is disposed on an upper side of the water tank and has a discharge hole formed in the upper side, wherein the main body includes a water storage space where supplied water is temporarily stored; a vibrator disposed on the bottom surface of the water storage space; a display disposed on an exterior wall; and a machine room formed in a lower side of the water storage space.

[0004] In the conventional humidifier, since the display is disposed on the peripheral wall of the main body forming the water storage space, there is a problem in that it is difficult to electrically connect to the machine room so as to supply power to the display.

[0005] In addition, since the display is disposed on the peripheral wall of the main body forming the water storage space, there is a risk of electric leakage from the display to the water stored in the water storage space. At this time, there is a problem of causing damage to user's body.

[0006] The present invention is specified by the independent claim. Preferred embodiments are defined by the dependent claims. The invention has been made in view of the above problems, and may provide a humidifier having improved durability.

[0007] The invention may further provide a humidifier having improved waterproof performance.

[0008] The invention may further provide a humidifier having a reduced risk of flooding.

[0009] The invention may further provide a humidifier with a reduced risk of short circuit.

[0010] The invention may further provide a humidifier having improved safety in use.

[0011] In accordance with an aspect of the present invention, a humidifier includes a molding member filled between the display substrate and the humidifying device, thereby protecting a display from moisture.

[0012] The humidifier further includes: a case which accommodates the humidifying device and the display; and a water tank which is disposed on an upper side of the humidifying device, and stores water, wherein the case includes: an outer shell which is spaced outward from the water tank; and an inner shell which is disposed inside the outer shell, and in which the water tank is accommodated therein, wherein a first discharge flow path through which humidified air flows is formed between the inner shell and the water tank, and the display is disposed outside the inner shell, so that the display may be isolated from the discharge flow path through which humidified air flows.

[0013] The humidifier further includes: a blowing fan which is disposed on a lower side of the humidifying device and forms a rising airflow, the case includes an outer case which extends downward from the outer shell, and in which the humidifying device and the blowing fan are disposed, wherein a blowing flow path is formed between the humidifying device and the outer case, and the display is disposed on the blowing flow path, so that dry air flowing through the blowing flow path can pass through the display.

[0014] The humidifier further includes: an electrical equipment unit which is disposed on a lower side of the humidifying device and supplies power, the main housing includes a housing recess recessed upward from a lower surface, wherein the housing recess is located above a lower surface of the display housing, and a first communication opening is formed between the housing recess and the lower surface of the display housing, so that the first communication opening may be spaced apart from the flow path of humidified air.

[0015] The electrical equipment unit includes: a power supply unit that supplies power; and an electrical equipment housing in which the power supply unit is accommodated, wherein the electrical equipment housing includes a wire hole which is located in a lower side of the housing recess, and opened upward, so that the wire connected to the electrical equipment unit may be connected to the display through the wire hole.

[0016] The humidifying device includes: a first valve which controls an amount of water inflow; and an accommodation space in which the first valve is disposed, wherein the humidifying device has a second communication opening which is formed to communicate the accommodation space with an internal space of the display housing, so that the wire may be connected to the first valve through the first communication opening and the second communication opening.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] 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 perspective view of a flow path unit according to an embodiment of the present invention;
FIG. 6 is a coupling exploded view of a flow path unit according to an embodiment of the present invention;
FIG. 7 is a diagram illustrating a humidifying device and a flow path unit according to an embodiment of the present invention;
FIG. 8 is a coupling exploded view of a display, a humidifying device, and a middle tray according to an embodiment of the present invention;
FIG. 9 is a coupling exploded view of a display and a humidifying device according to an embodiment of the present invention;
FIG. 10 is a perspective view of a portion of a humidifier according to an embodiment of the present invention;
FIG. 11 is a perspective view of a humidifying device according to an embodiment of the present invention;
FIG. 12 is a perspective view of a main housing according to an embodiment of the present invention;
FIG. 13 is a longitudinal cross-sectional view of a humidifying device according to an embodiment of the present invention; and
FIG. 14 is a longitudinal cross-sectional view of an electrical equipment unit according to an embodiment of the present invention.

DETAILED DESCRIPTION

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] A singular representation may include a plural representation unless context clearly indicates otherwise.

[0024] 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.

[0025] 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.

[0026] 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.

[0027] The case 10 may form an outer shape of the humidifier 1. The case 10 may extend longitudinally in the up-down direction. For example, the case 10 may have a cylindrical shape extending longitudinally 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.

[0028] 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 in 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.

[0029] The humidifier 1 may include a stand 16 that supports the case 10. The stand 16 may be disposed on the lower side of the case 10. The stand 16 may be fixed to the case 10. The stand 16 can prevent the case 10 from falling. The diameter of the stand 16 may be larger than the diameter of the case 10. The outer circumference of the stand 16 may be located outside the periph-

eral wall of the case 10 in the horizontal direction.

[0030] The discharge grill 160 may be disposed in the discharge hole. The discharge grill 160 may be disposed on 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.

[0031] 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 on 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.

[0032] 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.

[0033] The indoor air may be 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 formed therein (Fi). The air flowing inside the case 10 may be discharged back to the indoor space through a discharge hole 1600 formed in the upper side (Fi). At this time, the humidity of the discharged air may be higher than the humidity of the sucked air.

[0034] 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 (Fsl). The humidifying device 200 can generate humidified air using supplied water.

[0035] The humidifying device 200 may generate humidified air. Humidified air may include mist and/or water vapor. That is, humidified air may refer to air including mist and/or water vapor. The humidity of humidified air may be higher than the humidity of indoor air.

[0036] 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 (Fsl). 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.

[0037] 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 (Fsl). 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.

[0038] The blowing fan 350 may be disposed inside the case 10. The blowing fan 350 may be disposed on 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).

[0039] 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.

[0040] 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).

[0041] 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.

[0042] 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).

[0043] 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.

[0044] 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.

[0045] 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 on 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.

[0046] 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.

[0047] 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.

[0048] 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.

[0049] Referring to FIG. 4, the blower 300 may include a filter 320, a blowing fan 350, and a blower motor.

[0050] 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.

[0051] 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.

[0052] 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 on 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.

[0053] 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 on the lower side of the motor cover 360. The shaft 354 of the blower motor 352 may penetrate the motor cover 360.

[0054] 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.

[0055] The case 10 may include an inner case 14 and an outer case 12. The outer case 12 may form 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 on 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.

[0056] The blowing flow path 390 may be formed 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.

[0057] The electrical equipment unit 380 may be disposed on 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.

[0058] 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 on 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.

[0059] Referring to FIG. 4, the blower 300 may include an electrical equipment unit 380.

[0060] 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).

[0061] 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.

[0062] 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.

[0063] 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.

[0064] 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.

[0065] Referring to FIG. 5, the flow path unit 100 may include a shell 130, 140, a discharge grill 160, and a water tank cover 150.

[0066] 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 accommodation 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.

[0067] The discharge grill 160 may be disposed on the upper side of the shell 130, 140. The discharge grill 160 may be disposed in the discharge hole 1600. The discharge grill 160 may be disposed on upper end of the shell 130, 140. For example, the discharge grill 160 may extend along the inner circumference of the upper end of the shell 130, 140. The discharge grill 160 may include a plurality of vanes.

[0068] The water tank cover 150 may be disposed on 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 in the center of the annular discharge grill 160. For example, the water tank 110 may be disposed in the center of the shell 130, 140, and the water tank cover 150 may cover the open upper side of the water tank 110.

[0069] Referring to FIG. 6, 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.

[0070] The water tank 110 may be formed in a cylindrical shape. The water tank 110 may extend in the vertical direction. The water tank 110 may have a water storage space 1100 formed therein. 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 outside the upper end of the water tank 110. The water tank 110 may include a water tank peripheral wall 112 that forms an outer shape. The water tank peripheral wall 112 may partition the water storage space 1100 of the water tank 110.

[0071] The water tank housing 120 may accommodate the water tank 110. The water tank housing 120 may have an internal space where 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 for 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 into 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 so that it does not move in the horizontal direction. The water tank housing 120 may be maintained horizontally so that the water tank 110 does not tip 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.

[0072] The shell 130, 140 may include an 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 apart from the water tank 110 and/or the water tank housing 120 in an outward direction. A 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. A second discharge flow path 1000b may be formed between the inner shell 130 and the inner surface of 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.

[0073] The shell 130, 140 may include an outer shell 140. The case 10 may include the 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 upper side of the outer shell 140 may be open. 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 outer 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 partitions the internal space.

[0074] Referring to FIG. 7, humidified air discharged from the humidifying device 200 may be discharged through the flow path unit 100.

[0075] The humidifying device 200 may include a main housing 2000, a supply pipe 210, and a humid air outlet 2742.

[0076] The main housing 2000 may form the outer shape of the humidifying device 200.

[0077] Water stored in the 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 on 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.

[0078] Humidified air generated by the humidifying device 200 may be discharged through the humid air outlet 2742. The humid air outlet 2742 may be formed in the upper side of the humidifying device 200. The humid air outlet 2742 may be open in the upper surface of the humidifying device 200.

[0079] The middle tray 400 may be disposed on the upper side of 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.

[0080] The display 500 may be disposed on one side of the humidifying device 200. The display 500 may be coupled to one side of the 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 on the upper surface of the humidifying device 200, and the display 500 may be disposed on the side surface of the humidifying device 200.

[0081] The flow path unit 100 may include the water storage space 1100, the discharge flow path 1000, and the discharge hole 1600.

[0082] The water storage space 1100 may be formed inside the flow path unit 100. Water stored in the water storage space 1100 may be supplied to the humidifying device 200. For example, the water stored in the storage space 1100 may flow into the humidifying device 200 through the supply pipe 210 located in the lower side.

[0083] 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 the first discharge flow path 1000a located outside the water storage space 1100 and the second discharge flow path 1000b located outside 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.

[0084] 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. The 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 may be 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.

[0085] Referring to FIGS. 8 and 10, the middle tray 400 may be coupled to the upper side of the humidifying device 200, and the display 500 may be coupled to the side surface of the middle tray 400 and the humidifying device 200.

[0086] The middle tray 400 may be seated on the upper side of the humidifying device 200. The supply pipe 210 of the humidifying device 200 may penetrate the middle tray 400. The supply pipe 210 of the humidifying device 200 may be disposed in a middle inlet 4002 of the middle tray 400. The middle tray 400 may include a middle outlet 4004 corresponding to the humid air outlet 2742 of the humidifying device 200.

[0087] The display 500 may be coupled to the side surface of the humidifying device 200. The middle tray 400 may be coupled to the upper side of the humidifying device 200, and the display 500 may be coupled to the side surface of the middle tray 400 and the side surface of the humidifying device 200.

[0088] The display 500 may include a display housing 510 that forms the outer shape of the display 500. The one side of the display housing 510 may be open. The other side of the display housing 510 may be closed. The one side and the other side may be opposite to each other. For example, the display housing 510 may have one side that faces the humidifying device 200 and is open, and the other side that is opposite to the one side, faces the outside, and is closed.

[0089] The middle tray 400 may include a coupling cover 436. The coupling cover 436 may extend from the side surface of the middle tray 400. The coupling cover 436 may cover the side surface of the display housing 510. The coupling cover 436 may correspond to the side surface of the display housing 510.

[0090] The coupling cover 436 may include an upper cover 4362 that covers the upper surface of the display housing 510. The upper cover 4362 may cover at least a portion of the upper surface of the display housing 510. The upper cover 4362 may cover a gap formed between the display housing 510 and the middle tray 400.

[0091] The coupling cover 436 may include a side cover 4364 that covers the side surface of the display housing 510. The side cover 4364 may extend from the upper cover 4362. For example, the side cover 4364 may extend downward from the upper cover 4362. The side cover 4364 may cover at least a portion of the side surface of the display housing 510. The side cover 4364 may cover a gap formed between the display housing 510 and the middle tray 400.

[0092] The display 500 may be coupled to the middle tray 400. The display housing 510 may be fastened to the middle tray 400. The upper surface of the display housing 510 may be fastened to the upper cover 4362. The upper cover 4362 may include a first upper fastening portion 4365. The display housing 510 may include a second upper fastening portion 512 formed in the upper surface. The second upper fastening portion 512 may correspond to the first upper fastening portion 4365. For example, the first upper fastening portion 4365 and the second upper fastening portion 512 may be screw fastened.

[0093] The display 500 may be coupled to the humidifying device 200. The display housing 510 may be fastened to the side surface of the main housing 2000. The main housing 2000 may include a first side fastening portion 2004. The display housing 510 may include a second side fastening portion 514 formed in a side surface. The second side fastening portion 514 may correspond to the first side fastening portion 2004. For example, the first side fastening portion 2004 and the second side fastening portion 514 may be screw fastened.

[0094] Referring to FIG. 9, the display 500 may include a display substrate 520 installed inside the display housing 510.

[0095] The display housing 510 may include an internal space 5100 in which the display substrate 520 is disposed. The one side of the internal space 5100 may be open. For example, the display housing 510 may include an internal space 5100, and the internal space 5100 may be open toward the humidifying device 200. The display substrate 520 may be disposed in the internal space 5100 of the display housing 510, and may face the main housing 2000.

[0096] The humidifying device 200 may include a molding member (not shown) disposed between the display substrate 520 and the main housing 2000. The molding member may cover the display substrate 520. The molding member may be formed of an insulating material. The molding member may be formed of a waterproof material. For example, the molding member may be formed of silicone.

[0097] Referring to FIG. 11, the humidifying device 200 may include a heating water tank 230 that heats supplied water, a humidifying water tank 260 that generates hu-

midified air by using supplied water, a main cover 2020 that covers the heating water tank 230 and the humidifying water tank 260, and a compartment cover 270 coupled to the main cover 2020.

[0098] The heating water tank 230 may include a heater 250 that heats the stored water. The heater 250 may be disposed on the lower side of the heating water tank 230. The humidifying water tank 260 may be disposed on one side of the heating water tank 230. The humidifying water tank 260 may receive sterilized water from the heating water tank 230.

[0099] The main cover 2020 may be disposed on the upper side of the heating water tank 230 and the humidifying water tank 260. The main cover 2020 may cover the open upper side of the heating water tank 230 and the open upper side of the humidifying water tank 260. The main cover 2020 may be fixed to the heating water tank 230 and the humidifying water tank 260. The middle tray 400 may be coupled to the main cover 2020.

[0100] The compartment cover 270 may be fixed to the main cover 2020. The compartment cover 270 may be disposed on the humidifying water tank 260. The compartment cover 270 may guide the airflow flowing through the blowing flow path 390 to the inside of the humidifying water tank 260. The compartment cover 270 may discharge humidified air generated in the humidifying water tank 260 upward. The compartment cover 270 may include a discharge pipe 274 disposed in the humidifying water tank 260. The compartment cover 270 may include a humid air outlet 2742 that opens upward. The humid air outlet 2742 may be formed in one end of the discharge pipe 274.

[0101] The supply pipe 210 may protrude upward from the main cover 2020. The humidifying device 200 may include a first valve 212 that opens or closes a flow path through which water flows into the heating water tank 230 through the supply pipe 210. The first valve 212 may be disposed on the upper side of the main cover 2020.

[0102] Referring to FIG. 12, the main housing 2000 includes a housing recess 2012 recessed from a lower surface, a base opening 2016, 2018 penetrating a bottom surface, and a drain hole 2015 through which residual water is discharged.

[0103] The main housing 2000 may include a housing base 2010 which is a bottom surface. One surface of the housing base 2010 may form the inner bottom surface of the main housing 2000, and the other surface of the housing base 2010 may form the outer bottom surface of the main housing 2000.

[0104] The housing recess 2012 may be recessed upward from the housing base 2010. The housing recess 2012 may be located in the upper side of the housing base 2010. The housing recess 2012 may protrude from housing base 2010. For example, the housing recess 2012 may protrude upward from the housing base 2010.

[0105] The base opening 2016, 2018 may be a through hole formed in the main housing 2000. The base opening 2016, 2018 may be formed in the housing base 2010. The base opening 2016, 2018 may communicate the inner space of the main housing 2000 with the inner space of an electrical equipment housing 382. The base opening 2016, 2018 may include a first base opening 2016 and a second base opening 2018. The first base opening 2016 and the second base opening 2018 may be spaced apart from each other. The electrical equipment unit 380 and the humidifying device 200 may be electrically connected through the base opening 2016, 2018.

[0106] The main housing 2000 may include a base peripheral wall 2017, 2019 that protrudes from the circumference of the base opening 2016, 2018. The base peripheral wall 2017, 2019 may protrude toward the inside of the main housing 2000 from the circumference forming the base opening 2016, 2018. For example, the base peripheral wall 2017, 2019 may protrude upward from the circumference forming the base opening 2016, 2018. The base peripheral wall 2017, 2019 may include a first base peripheral wall 2017 protruding from the circumference of the first base opening 2016. The base peripheral wall 2017, 2019 may include a second base peripheral wall 2019 protruding from the circumference of the second base opening 2018.

[0107] The drain hole 2015 may be a through hole formed in the main housing 2000. The drain hole 2015 may be formed in the lower portion of the main housing 2000. The drain hole 2015 may be formed in the housing base 2010. The drain hole 2015 may communicate with the inside and outside of the main housing 2000. For example, the drain hole 2015 may communicate the inside of the main housing 2000 with the inside of the case 10. The drain hole 2015 may be formed in the edge of the housing base 2010. There may be a plurality of drain holes 2015.

[0108] Referring to FIG. 13, the humidifying device 200 may include the main housing 2000, the supply pipe 210, the first valve 212, the heating water tank 230, a first connection pipe 240, a drain pipe 290, the humidifying water tank 260, and the compartment cover 270.

[0109] The main housing 2000 may be disposed inside the case 10. The main housing 2000 may accommodate the heating water tank 230 and the humidifying water tank 260. The upper side of the main housing 2000 may be open.

[0110] 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 200 through the supply pipe 210. For example, the 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 tank. The water flowing into the supply pipe 210 may be temporarily stored in the supply chamber 2100.

[0111] 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, water stored in the supply chamber 2100 may move 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 from the electrical equipment unit 380. The first valve 212 may receive 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 on 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 disposed to be spaced upward from the upper surface of the heating water tank 230.

[0112] 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 sterilize water by heating it. The water heated in the heating water tank 230 may flow into the humidifying water tank 260.

[0113] The first connection pipe 240 may be a pipe through which water stored in the heating water tank 230 flows into 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 be lowered while flowing through the first connection pipe 240.

[0114] 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 residual 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 water tank 230. For example, the drain pipe 290 may be connected to the bottom surface of the heating water tank 230.

[0115] The humidifying water tank 260 may generate humidified air by using supplied water. Humidified air may refer to air containing mist 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 by using an ultrasonic vibrator. The humidifying water tank may be equipped with a vibration device 262.

[0116] The vibration device 262 may be disposed on 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 in an electrical manner. For example, the vibration device 262 may include a piezoelectric element.

[0117] The compartment cover 270 may be disposed on 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 mist 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 enters the humidifying water tank 260 through the blowing flow path 390 may flow by pulling the mist generated in the humidifying water tank 260. Through this, the mist generated in the humidifying water tank 260 may be discharged. The discharge pipe 274 may extend in the vertical direction. The discharge pipe 274 may form a discharge flow path 2740. A humid air outlet 2742 may be formed in one end of the discharge pipe 274. The discharge pipe 274 may be inserted into the humidifying water tank 260.

[0118] The humidifying device 200 may include a communication flow path 280 connecting 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 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 moved 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, the mist generated in the humidifying water tank 260, and the rising airflow formed by the blowing fan 350.

[0119] Referring to FIG. 13, the humidifier 1 may include a first communication opening 2013 and a second communication opening 2122 that communicate with the internal space 5100 of the display housing 510.

[0120] The first communication opening 2013 may be connected to the internal space 5100 of the display housing 510. The first communication opening 2013 may communicate the internal space 5100 of the display housing 510 with the internal space of the case 10. The internal

space 5100 of the display housing 510 may be connected to the electrical equipment unit 380 through the first communication opening 2013. For example, a wire (not shown) connected to the electrical equipment unit 380 may be connected to the display substrate 520 through the first communication opening 2013. Through this, the display 500 may receive power from the power supply device 384.

[0121] The first communication opening 2013 may be located outside of the humidifying device 200. The first communication opening 2013 may be defined between the humidifying device 200 and the display 500. The first communication opening 2013 may be defined between the display housing 510 and the main housing 2000. The housing recess 2012 may be spaced upward from the lower surface of the display housing 510. The first communication opening 2013 may be a separation gap between the housing recess 2012 and the lower surface of the display housing 510.

[0122] The second communication opening 2122 may be connected to the internal space 5100 of the display housing 510. The second communication opening 2122 may communicate the internal space 5100 of the display housing 510 with the internal space of the humidifying device 200. The humidifying device 200 may include an accommodation space 2120 in which the first valve 212 is disposed. The second communication opening 2122 may communicate the internal space 5100 of the display housing 510 with the accommodation space 2120 of the humidifying device 200. A wire may be connected to the first valve 212 through the second communication opening 2122. Through this, the first valve 212 may receive power from the power supply device 384.

[0123] The second communication opening 2122 may be defined in the outer wall of the humidifying device 200. The second communication opening 2122 may be adjacent to the first valve 212. The second communication opening 2122 may face the display substrate 520. The wire wired to the internal space 5100 of the display housing 510 through the first communication opening 2013 may be connected to the first valve 212 through the second communication opening 2122. The accommodation space 2120 may be defined between the main cover 2020 and the middle tray 400. The second communication opening 2122 may be a separation gap between the peripheral wall of the middle tray 400 and the peripheral wall of the main cover 2020.

[0124] Referring to FIG. 14, the first substrate 384 and the third substrate 386 may be disposed inside a control box 385, and the second substrate 388 may be disposed on the inner surface of the electrical equipment housing 382.

[0125] The electrical equipment housing 382 may include a seal recess 3828 in which the second substrate 388 is disposed. For example, controller 388 may be disposed in the seal recess 3828. The seal recess 3828 may protrude from the inner surface of the electrical equipment housing 382 in an outward direction. For example, the seal recess 3828 may be defined by recessing upward from the inner upper surface of the electrical equipment housing 382.

[0126] The second substrate 388 may be disposed upside down. In other words, the second substrate 388 may be disposed reversedly. The surface of the second substrate 388 may be disposed to face downward, and the rear surface of the second substrate 388 may be disposed to face upward. The surface of the substrate 384, 386, 388 may be one surface on which components for substrate are disposed. Components for substrate may include resistors, capacitors, inductors, switches, relays, sensors, etc.

[0127] The third substrate 386 may be disposed upside down. In other words, the third substrate 386 can be disposed reversely. The surface of the third substrate 386 may be disposed to face downward, and the rear surface 386 of the third substrate may be disposed to face upward. For example, the third substrate 386 may be fixed to a box bracket 3857 so that its surface faces downward.

[0128] The electrical equipment housing 382 may include a wire hole 3826 through which wire passes. The wire hole 3826 may be a through hole defined in the upper surface of the electrical equipment housing 382. The wire passing through the wire hole 3826 may connect the electrical equipment unit 380 and the display 500. In addition, the wire passing through the wire hole 3826 may connect the electrical equipment unit 380 and the humidifying device 200. For example, the wire passing through the wire hole 3826 may connect the controller 388 and the first valve 212 of the humidifying device 200.

[0129] The wire hole 3826 may be located in the lower side of the housing recess 2012. The wire hole 3826 may be adjacent to the first communication opening 2013. The wire connected to the electrical equipment unit 380 may be connected to the display 500 through the wire hole 3826 and the first communication opening 2013. The wire connected to the electrical equipment unit 380 may be connected to the first valve through the first communication opening 2013 and the second communication opening 2122.

[0130] Referring to FIGS. 1 to 14, a humidifier according to one aspect of the present invention includes: a humidifying device which generates humidified air; a display coupled to one side of the humidifying device, wherein the display includes: a display housing which is open toward the humidifying device; and a display substrate which is installed inside the display housing, wherein the humidifying device includes a coupling cover which extends in an outward direction, and covers the display housing.

[0131] According to another aspect of the present invention, the humidifying device includes: a humidifying water tank which generates humidified air; a main housing which accommodates the humidifying water tank; and a middle tray which is coupled to an upper side of the main housing, wherein the display is fixed to the main housing and the middle tray.

[0132] According to another aspect of the present invention, the coupling cover includes an upper cover which is formed on an outer surface of the middle tray, and covers an upper surface of the display housing.

[0133] According to another aspect of the present invention, the coupling cover includes a side cover which extends from the upper cover, and covers a side surface of the display housing.

[0134] According to another aspect of the present invention, the display is coupled to a side surface of the humidifying device, wherein the humidifying device includes: a supply pipe which is disposed on an upper surface and receives water; and a humid air outlet which is opened on an upper surface and discharges humidified air.

[0135] According to another aspect of the present invention, the humidifier further includes a molding member filled between the display substrate and the humidifying device.

[0136] According to another aspect of the present invention, the humidifier further includes a case which accommodates the humidifying device and the display; and a water tank which is disposed on an upper side of the humidifying device, and stores water, wherein the case includes: an outer shell which is spaced outward from the water tank; and an inner shell which is disposed inside the outer shell, and in which the water tank is accommodated therein, a first discharge flow path through which humidified air flows is formed between the inner shell and the water tank, wherein the display is disposed outside the inner shell.

[0137] According to another aspect of the present invention, the humidifier further includes a blowing fan which is disposed on a lower side of the humidifying device and forms a rising airflow, wherein the case includes an outer case which extends downward from the outer shell, and in which the humidifying device and the blowing fan are disposed, wherein a blowing flow path is formed between the humidifying device and the outer case, wherein the display is disposed on the blowing flow path.

[0138] According to another aspect of the present invention, the humidifier further includes an electrical equipment unit which is disposed on a lower side of the humidifying device and supplies power, wherein the main housing includes a housing recess recessed upward from a lower surface, wherein the housing recess is located above a lower surface of the display housing, wherein a first communication opening is formed between the housing recess and the lower surface of the display housing.

[0139] According to another aspect of the present invention, the electrical equipment unit includes: a power supply unit that supplies power; and an electrical equipment housing in which the power supply unit is accommodated, wherein the electrical equipment housing includes a wire hole which is located in a lower side of the housing recess, and opened upward.

[0140] According to another aspect of the present invention, the humidifying device includes: a first valve which controls an amount of water inflow; and an accommodation space in which the first valve is disposed, wherein the humidifying device has a second communication opening which is formed to communicate the accommodation space with an internal space of the display housing.

[0141] According to at least one of the embodiments of the present invention, the coupling cover covers the gap formed between the display housing and the humidifying device, so that the amount of moisture infiltrating into the connection portion between the display and the humidifying device can be reduced. Thus, the risk of submerge of the display can be reduced and the waterproof performance of the humidifier can be improved.

[0142] According to at least one of the embodiments of the present invention, the humidifying device receives water from the upper side and discharges humidified air, and the display is provided on the side surface of the humidifying device, so that the display is spaced apart from the inflow and outflow paths of moisture, thereby reducing the risk of submerge of the display. In addition, the waterproof performance of the humidifier can be improved.

[0143] According to at least one of the embodiments of the present invention, the risk of submerge of the display can be reduced by providing a molding member that covers the display substrate.

[0144] According to at least one of the embodiments of the present invention, the display is isolated from the discharge flow path, thereby reducing the risk of submerge of the display.

[0145] According to at least one of the embodiments of the present invention, the display may be disposed in a blowing flow path through which dry air flows, thereby drying the display exposed to moisture. Thus, the risk of submerge of the display can be reduced and the waterproof performance of the humidifier can be improved.

[0146] According to at least one of the embodiments of the present invention, the first communication opening where the electric wire is disposed is spaced apart from the flow path of the humidified air, so that the risk of submerge of the humidifier and the risk of electric leakage can be reduced.

[0147] 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.

[0148] 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.

[0149] 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; and
   a display (500) coupled to one side of the humidifying device (200),
   wherein the display (500) comprises:

   a display housing (510) which is open toward the humidifying device (200); and
   a display substrate (520) which is installed inside the display housing (510), and
   wherein the humidifying device (200) comprises a coupling cover (436) which extends in an outward direction, and covers the display housing (510).

2. The humidifier of claim 1, wherein the humidifying device (200) comprises:

   a humidifying water tank (260) configured to generate humidified air;
   a main housing (2000) which accommodates the humidifying water tank (260); and
   a middle tray (400) which is coupled to an upper side of the main housing (2000), and
   wherein the display (500) is fixed to the main housing (2000) and the middle tray (400).

3. The humidifier of claim 2, wherein the coupling cover (436) comprises an upper cover (4362) which is defined on an outer surface of the middle tray (400), and covers an upper surface of the display housing (510).

4. The humidifier of claim 3, wherein the coupling cover (436) comprises a side cover (4364) which extends from the upper cover (4362), and covers a side surface of the display housing (510).

5. The humidifier of any one of claims 1 to 4, wherein the display (500) is coupled to a side surface of the humidifying device (200), and
   wherein the humidifying device (200) comprises:

   a supply pipe (210) which is disposed on an upper surface and configured to receive water; and
   a humid air outlet (2742) which is opened on the upper surface and configured to discharge humidified air.

6. The humidifier of any one of claims 1 to 5, further comprising a molding member filled between the display substrate (520) and the humidifying device (200).

7. The humidifier of any one of claims 1 to 6, further comprising:

   a case (10) which accommodates the humidifying device (200) and the display (500); and
   a water tank (110) which is disposed above the humidifying device (200), and configured to store water,
   wherein the case (10) comprises:

   an outer shell (140) which is spaced outward from the water tank (110); and
   an inner shell (130) which is disposed inside the outer shell (140), and in which the water tank (110) is accommodated therein,
   a first discharge flow path (1000a) through which humidified air flows is defined between the inner shell (130) and the water tank (110), and
   wherein the display (500) is disposed outside the inner shell (130).

8. The humidifier of claim 7, further comprising a blowing fan (350) which is disposed below the humidifying device (200) and configured to generate a rising airflow,

   wherein the case (10) comprises an outer case (12) which extends downward from the outer shell (140), and in which the humidifying device (200) and the blowing fan (350) are disposed,
   wherein a blowing flow path (390) is defined between the humidifying device (200) and the outer case (12),
   wherein the display (500) is disposed on the blowing flow path (390).

9. The humidifier of any one of claims 2 to 8, further comprising an electrical equipment unit (380) which is disposed below the humidifying device (200) and configured to supply power,

   wherein the main housing (2000) comprises a

housing recess (2012) recessed upward from a lower surface,
wherein the housing recess (2012) is located at an upper side than a lower surface of the display housing (510),
wherein a first communication opening (2013) is defined between the housing recess (2012) and the lower surface of the display housing (510).

10. The humidifier of claim 9, wherein the electrical equipment unit (380) comprises:

a power supply unit configured to supply power; and
an electrical equipment housing (382) in which the power supply unit is accommodated, and
wherein the electrical equipment housing (382) comprises a wire hole (3826) which is located below the housing recess (2012), and opened upward.

11. The humidifier of any one of claims 1 to 10, wherein the humidifying device (200) comprises:

a first valve (212) configured to control an amount of water inflow; and
an accommodation space (2120) in which the first valve (212) is disposed, and
wherein the humidifying device (200) comprises a second communication opening (2122) which communicates the accommodation space (2120) with an internal space of the display housing (510).

FIG. 1

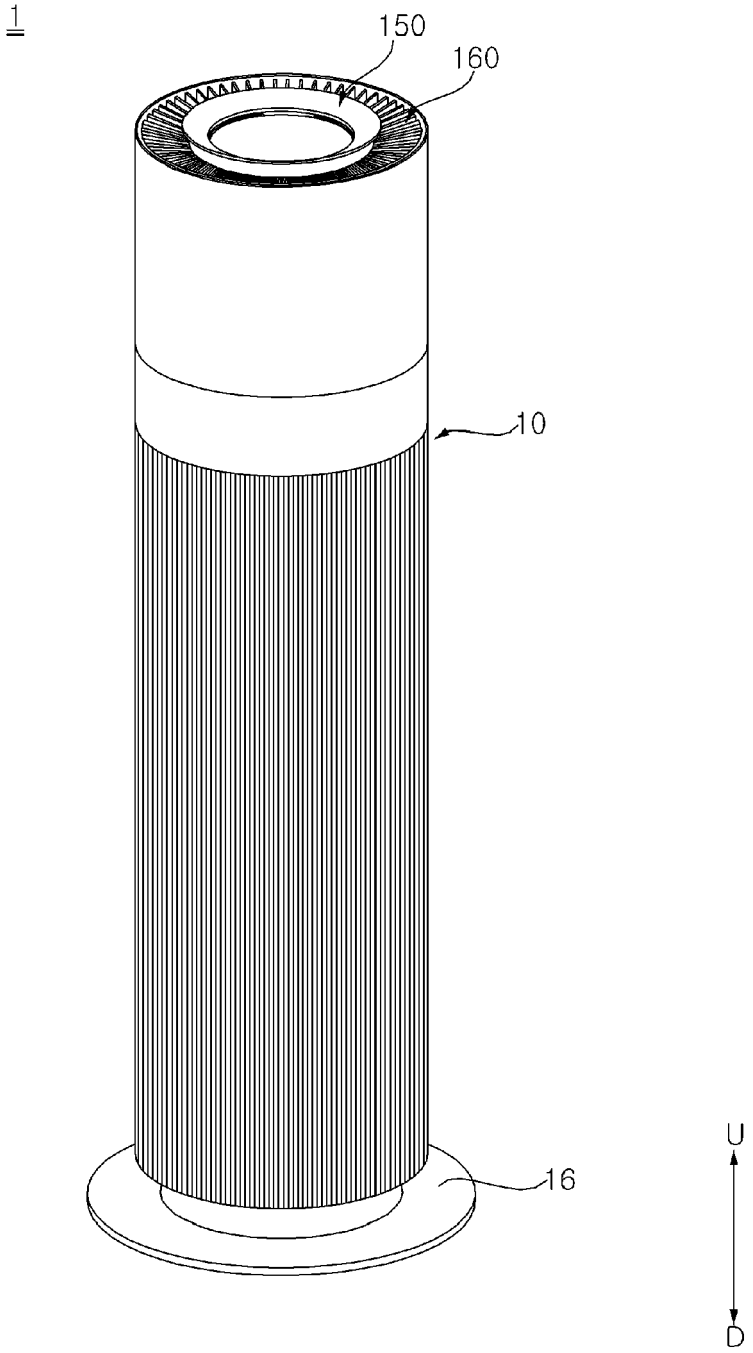
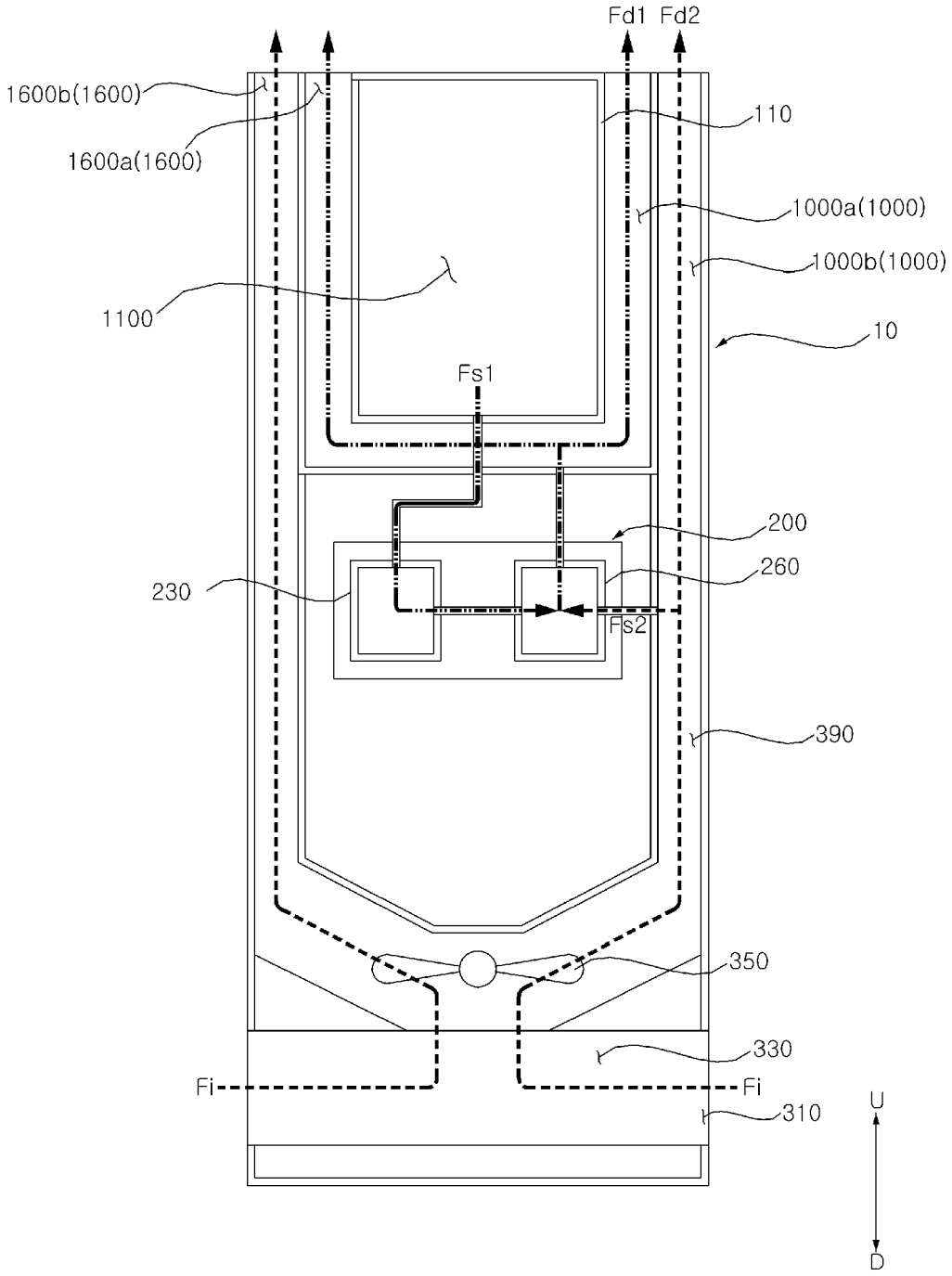


FIG. 2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Fd2
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1600a(1600)
110
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Fs1
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Fs2
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350
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Fi
Fi
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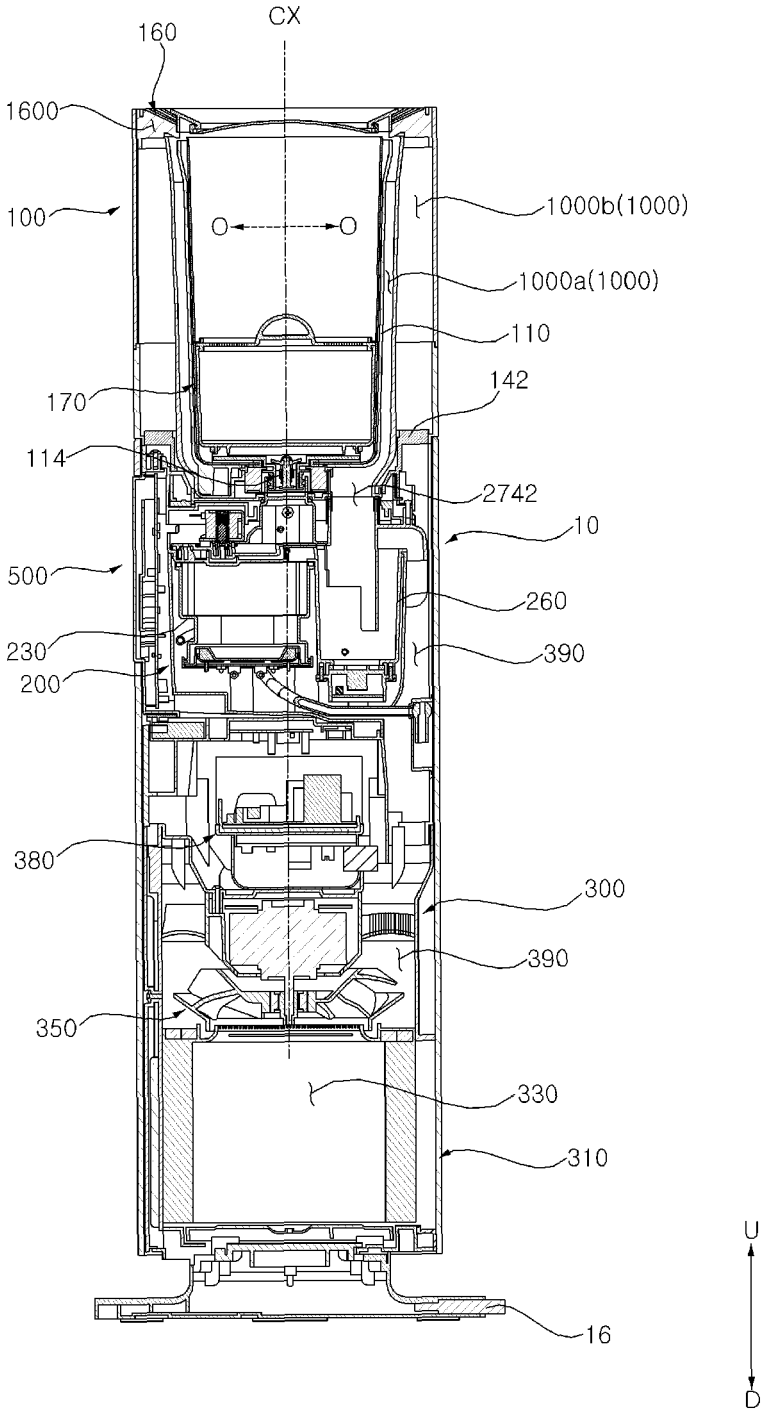
U
D

FIG. 3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300
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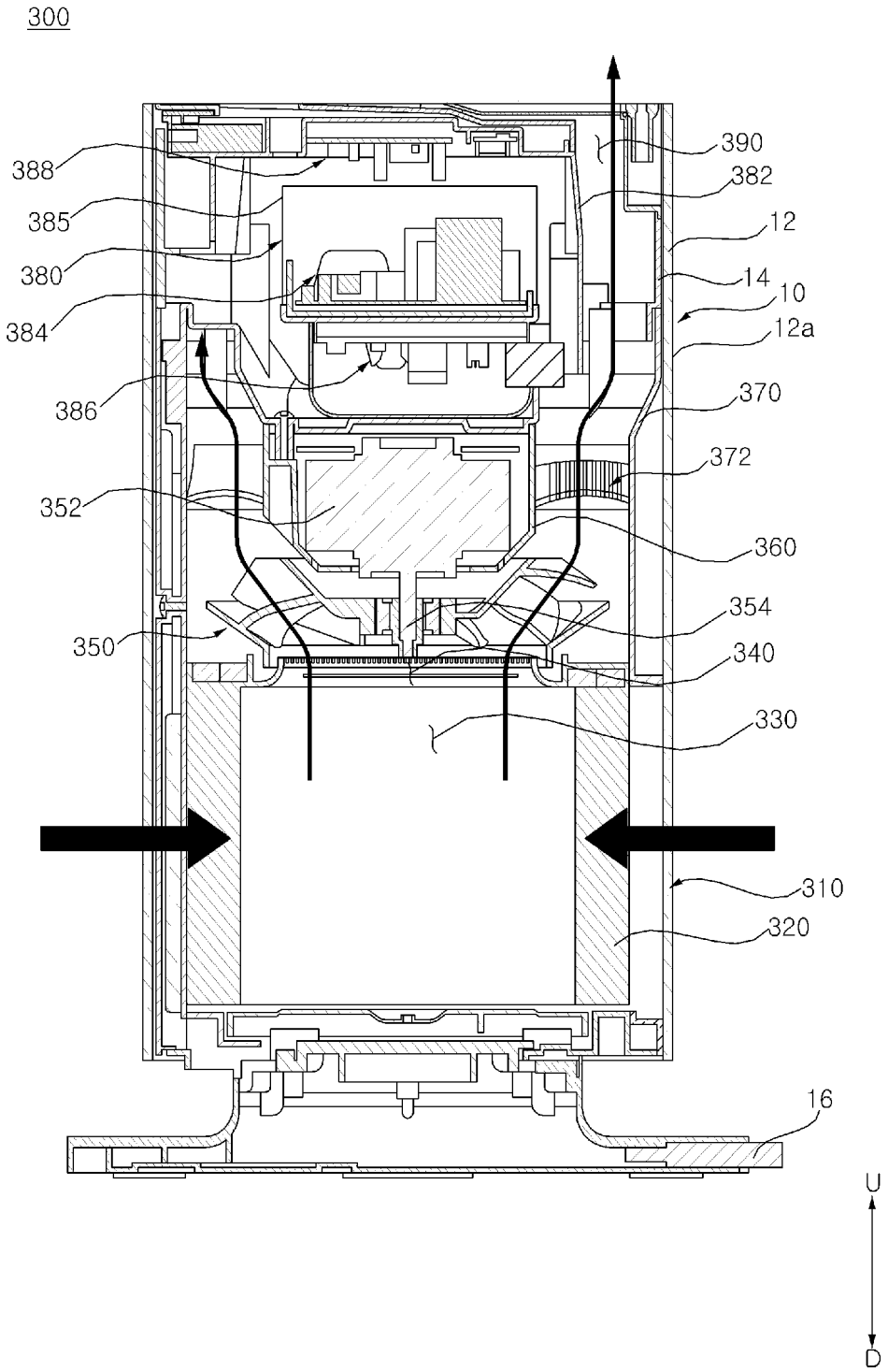
350
330
310
16
U
D

FIG. 4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U
D

FIG. 5

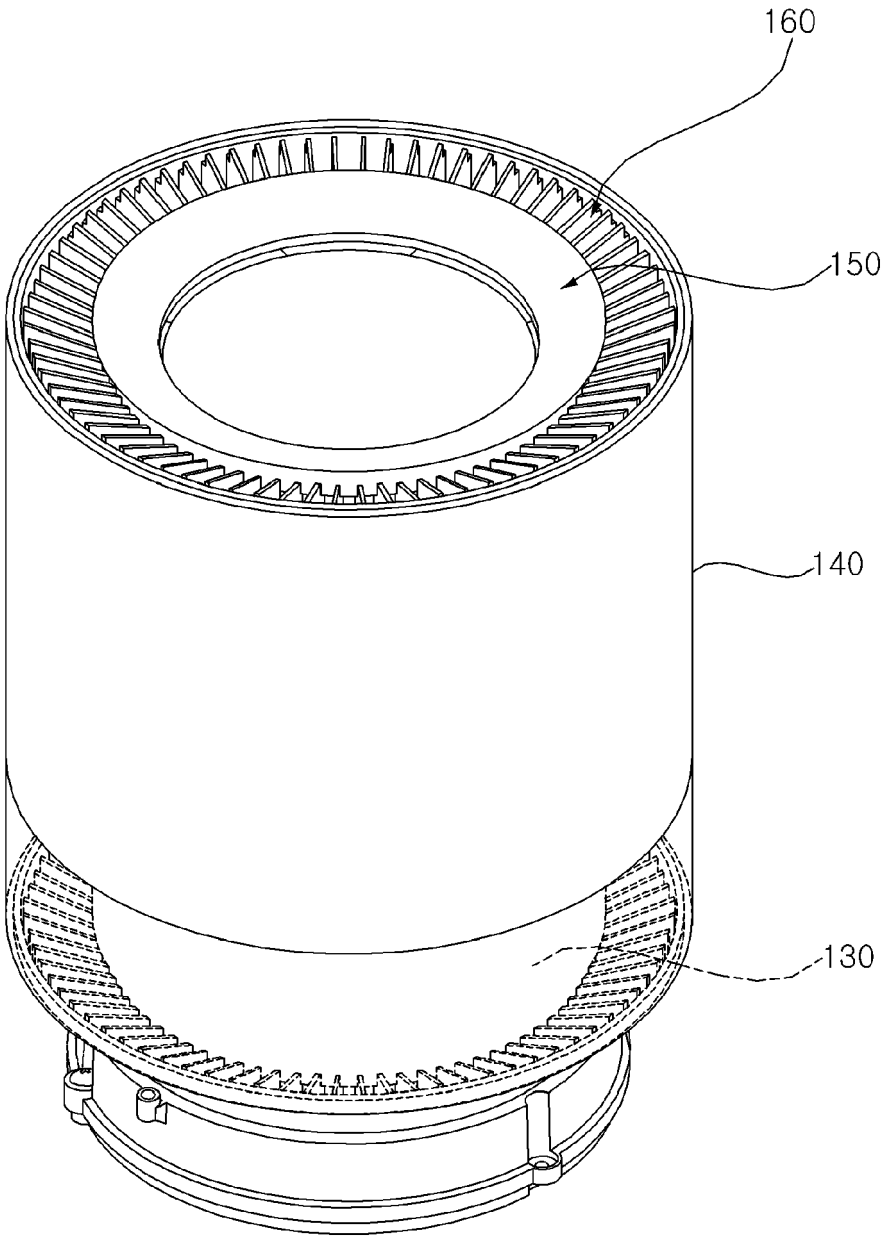


FIG. 6

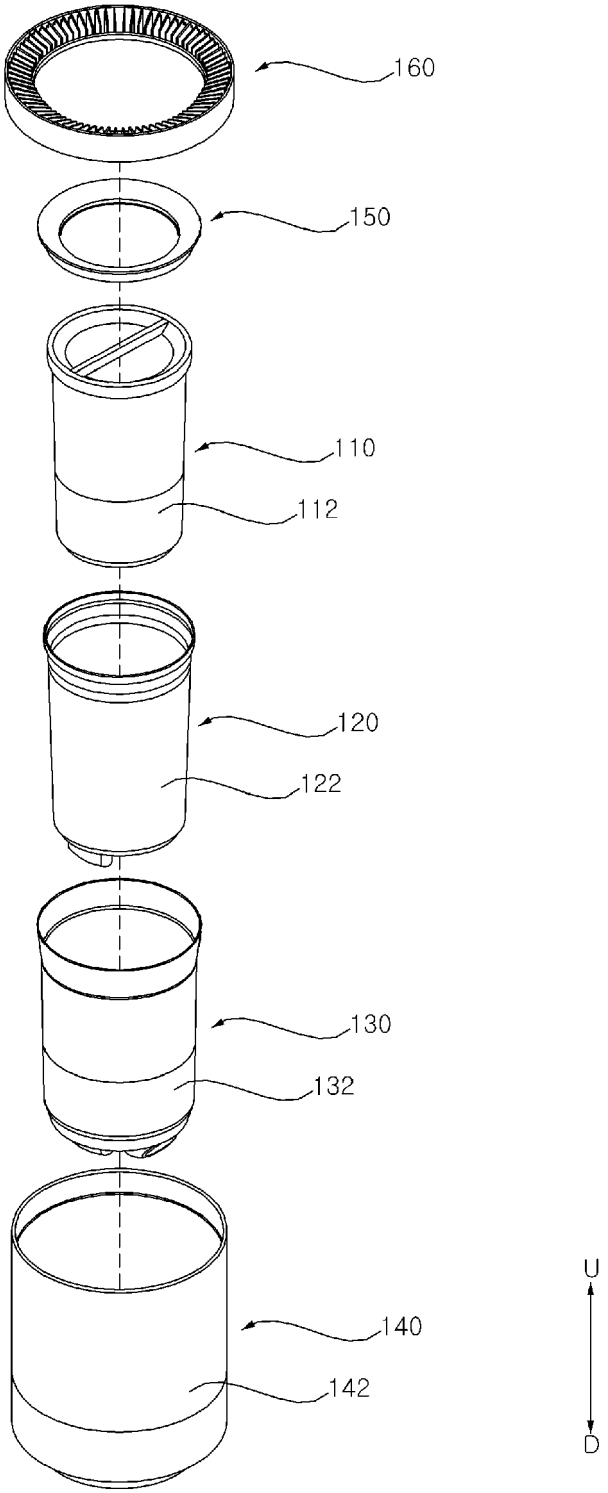
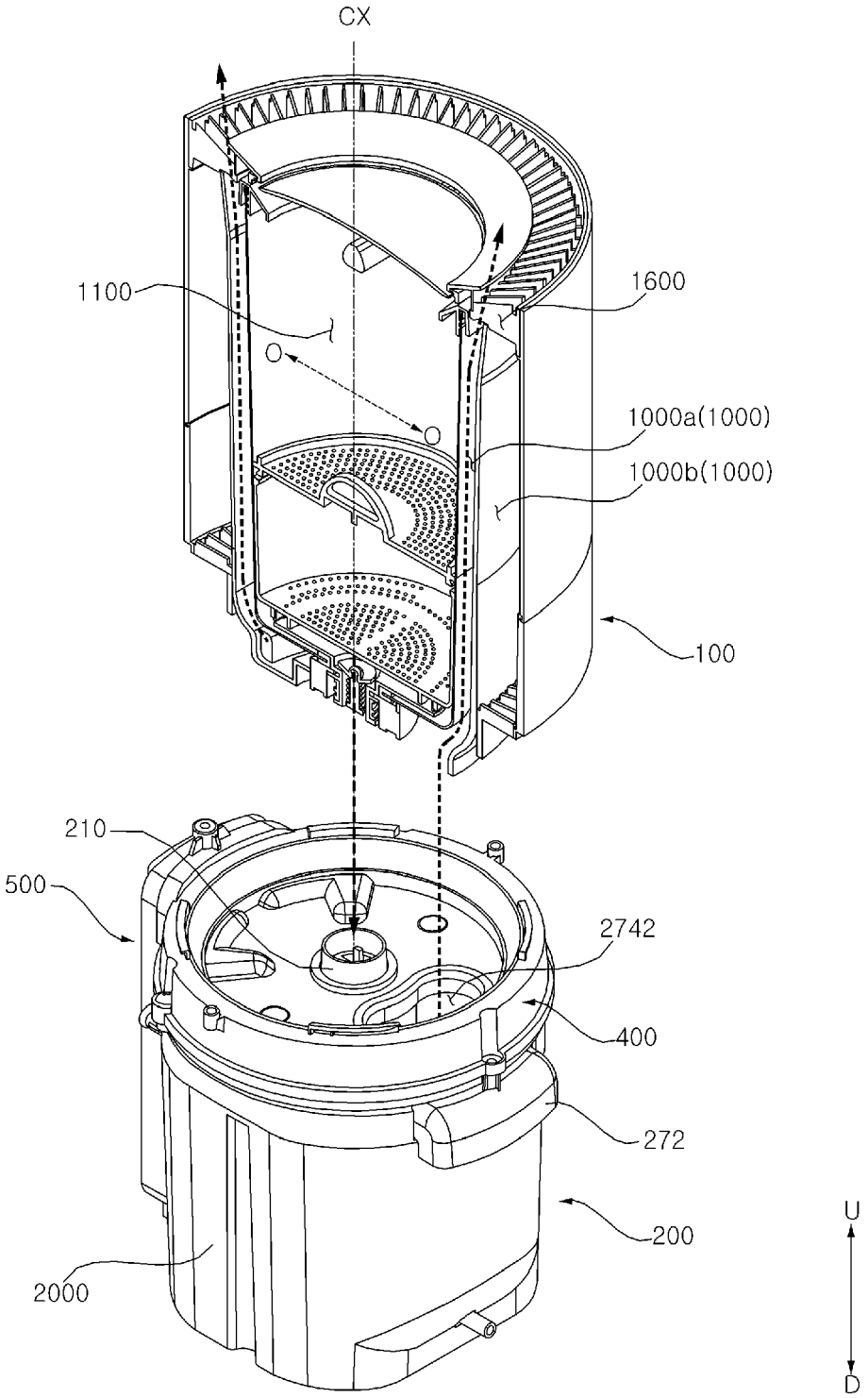


FIG. 7


CX
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1000b(1000)
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2742
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272
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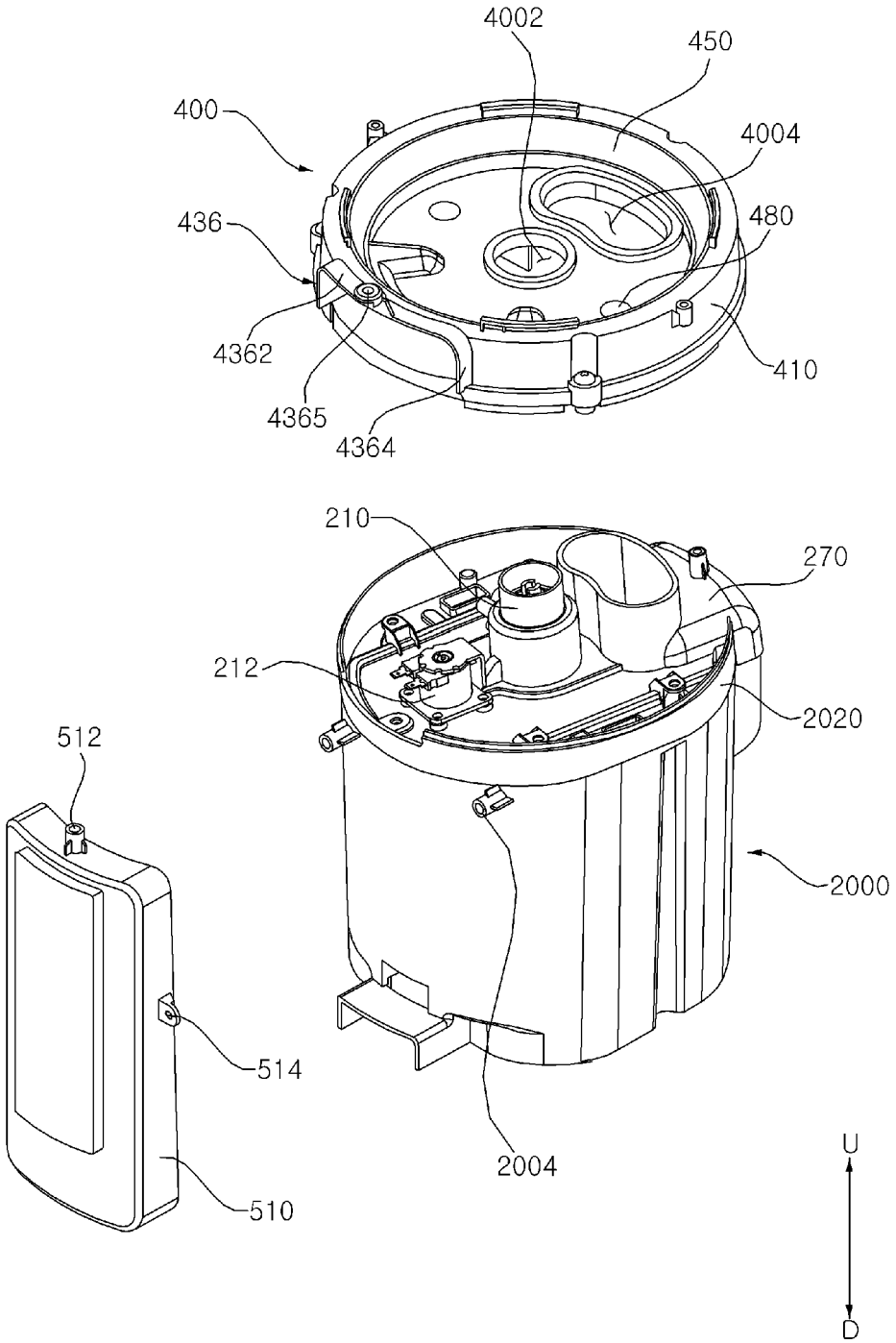
D

FIG. 8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2004
510
U
D

FIG. 9

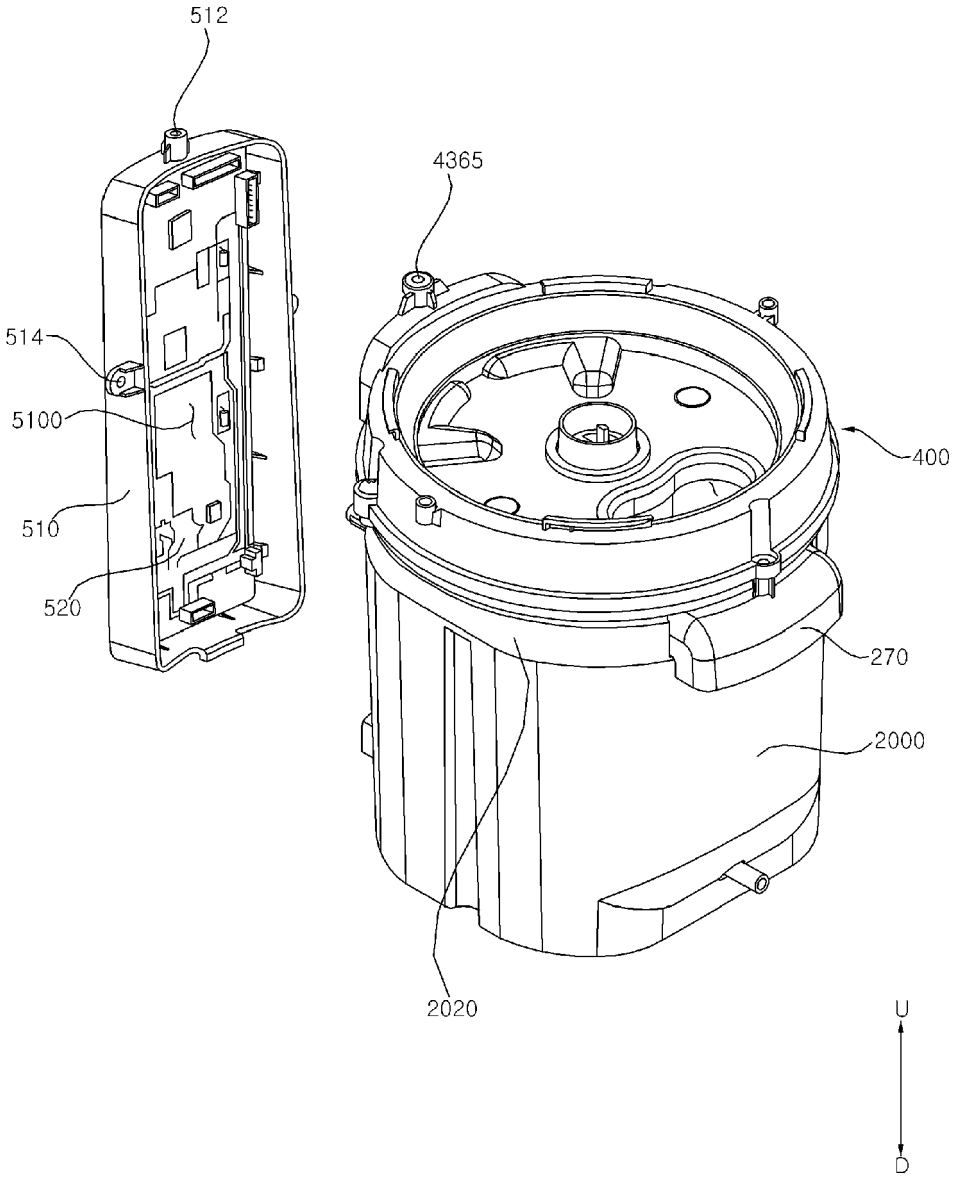


FIG. 10

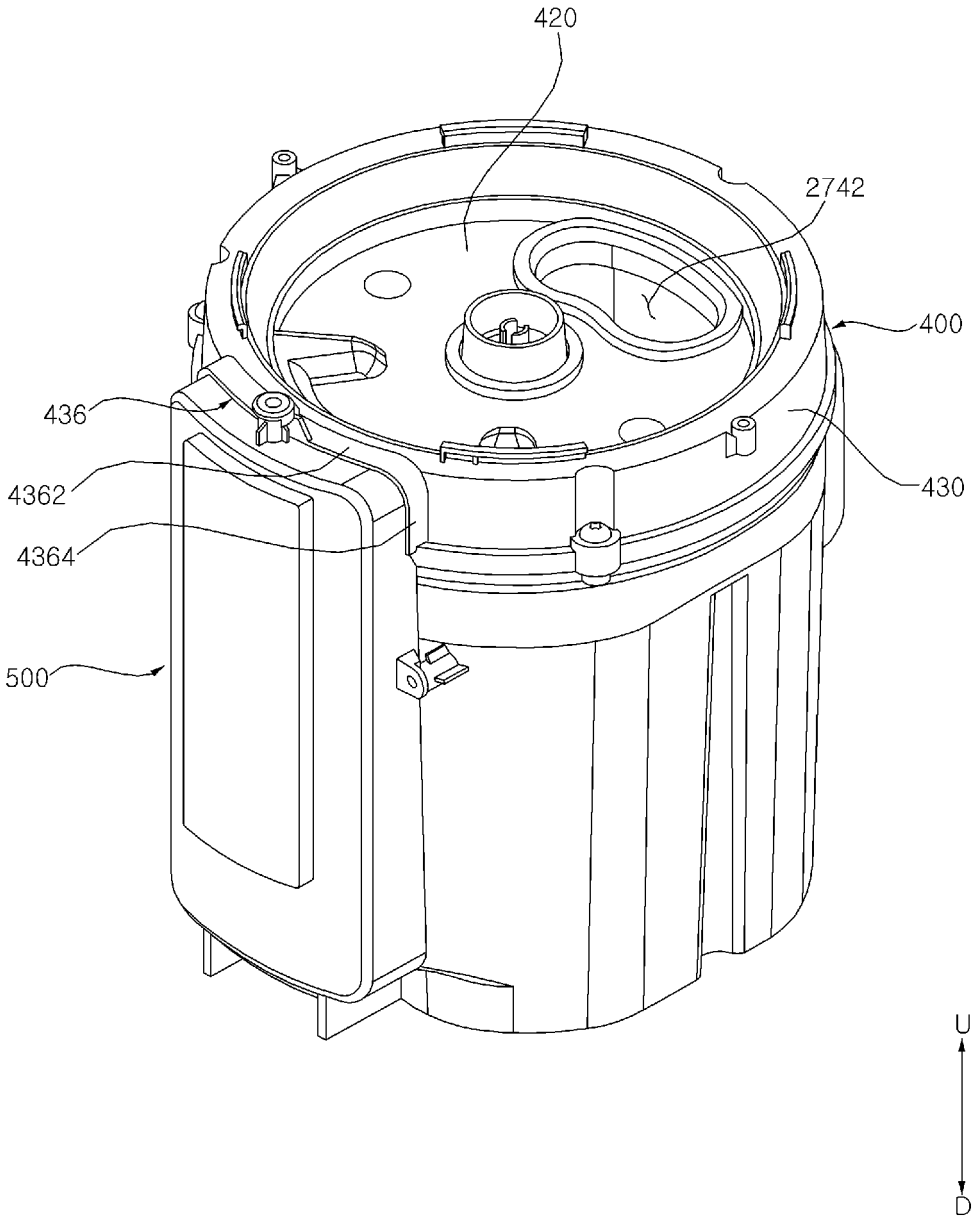


FIG. 11

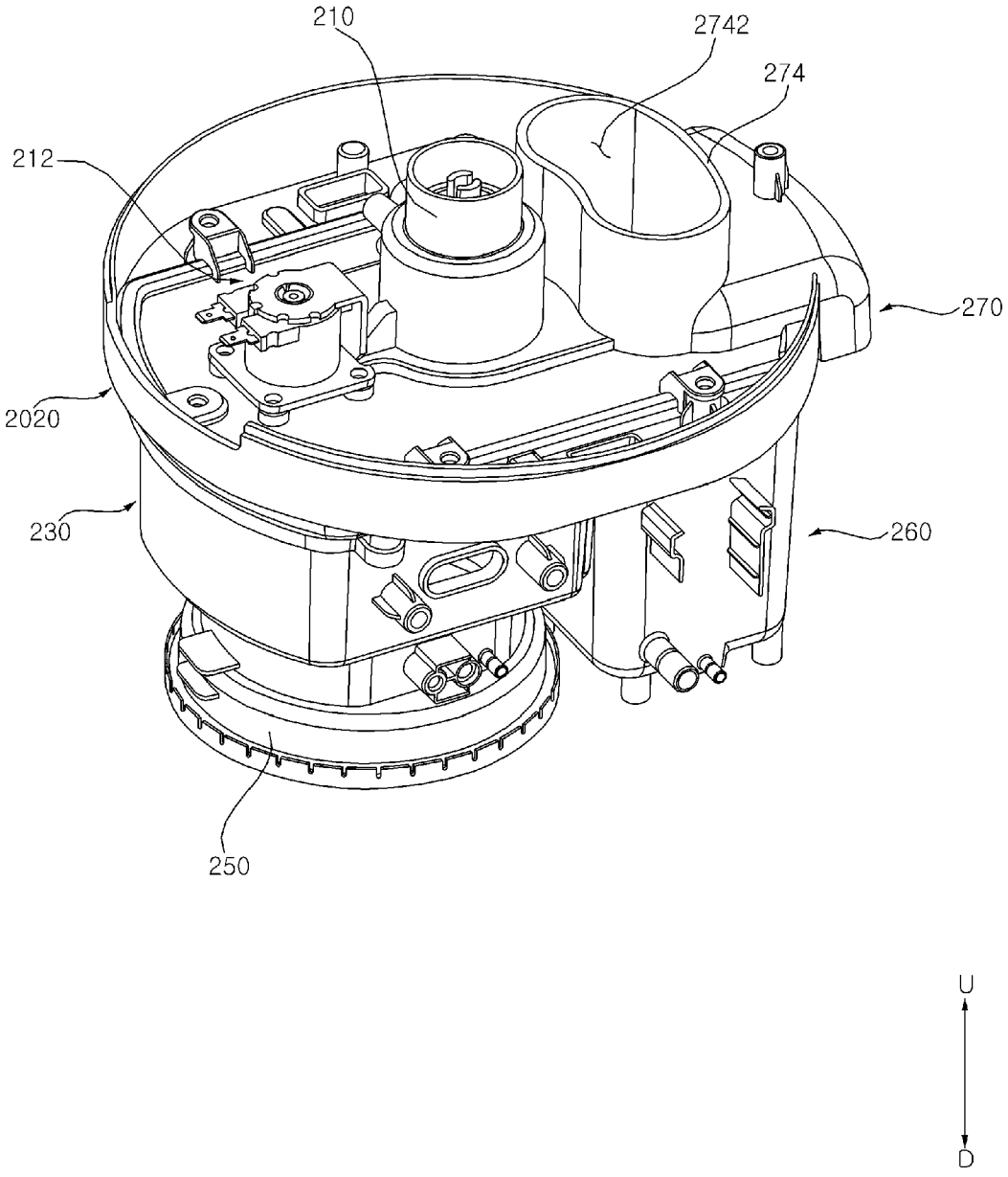


FIG. 12

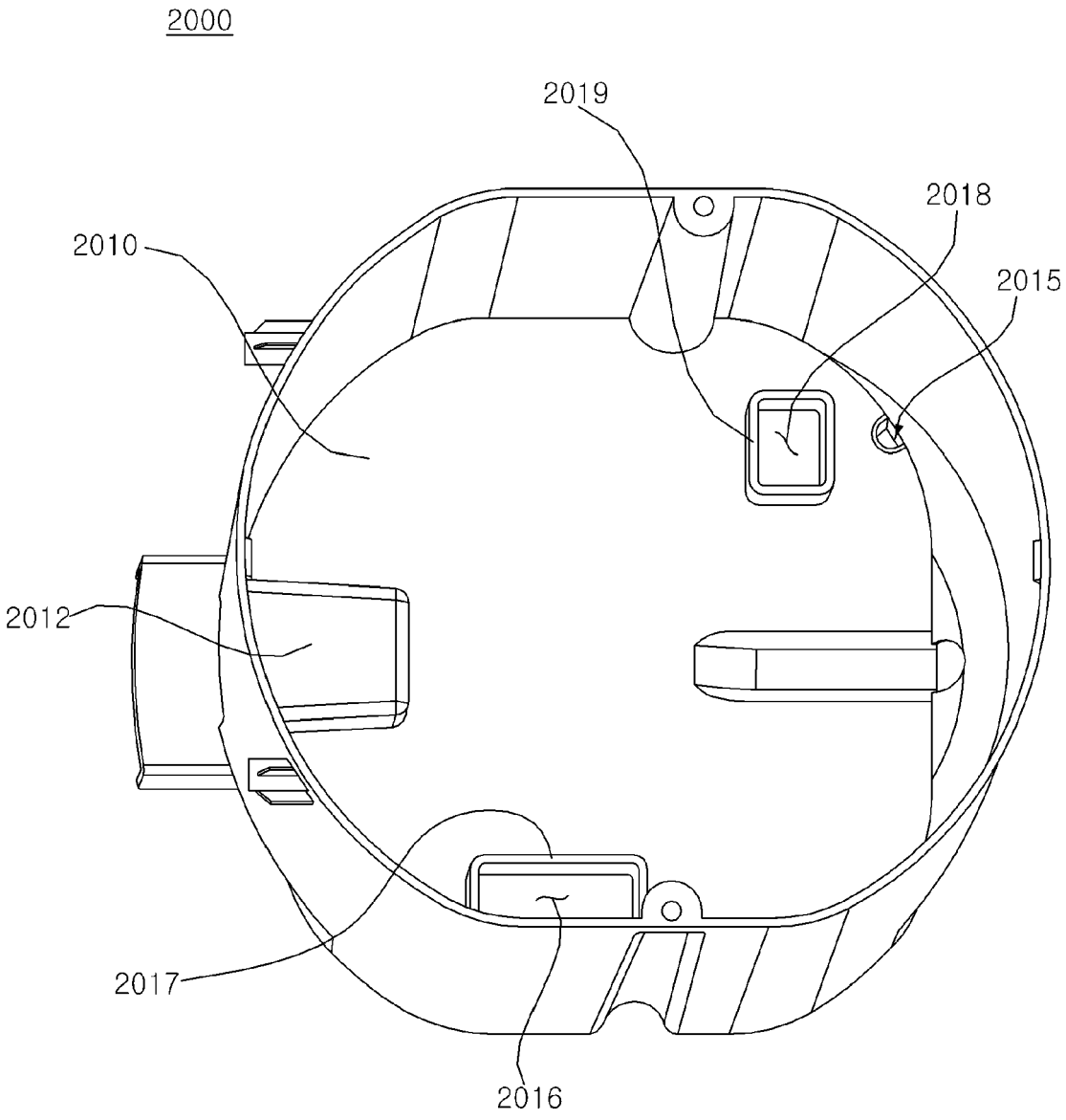
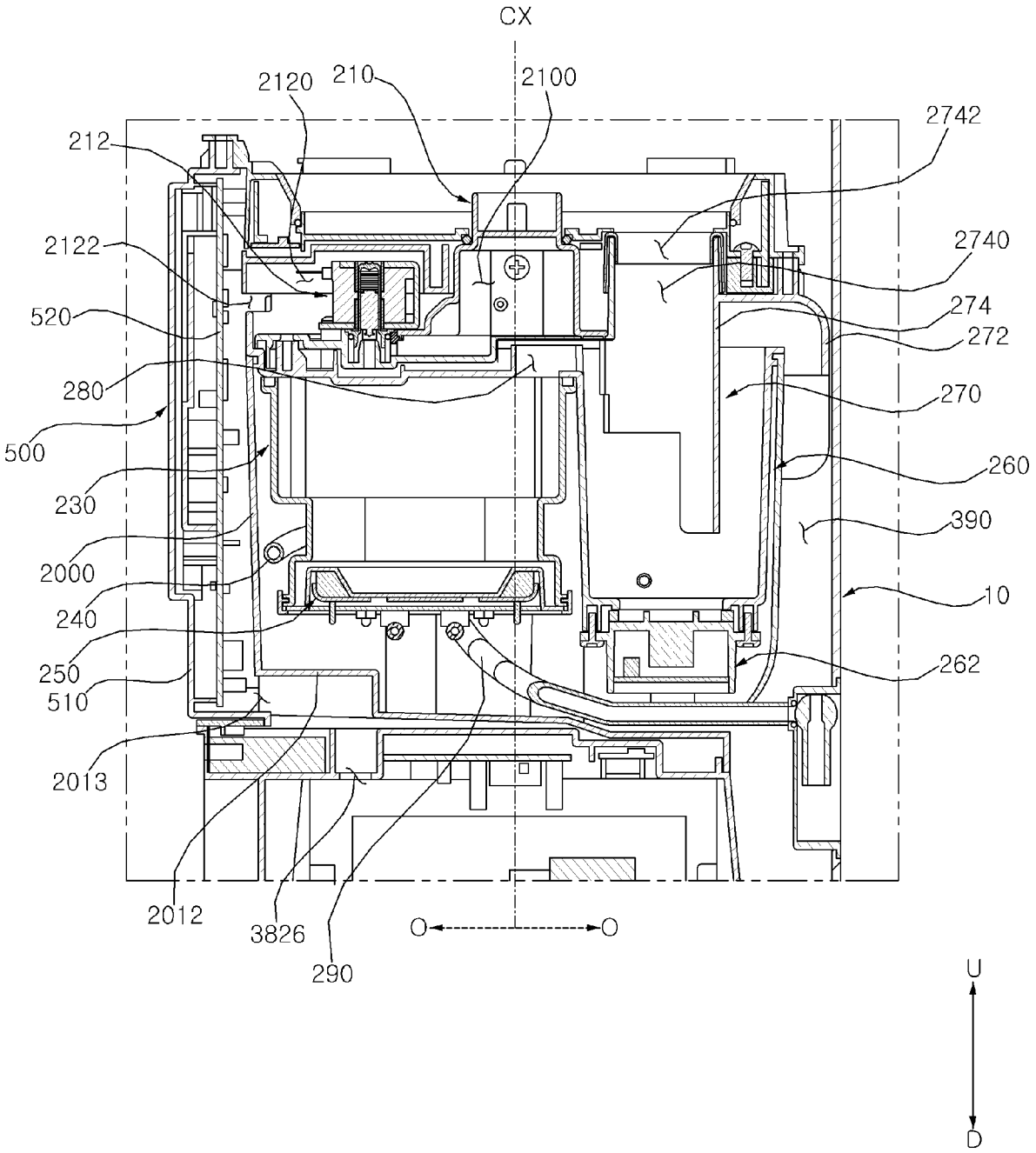


FIG. 13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O
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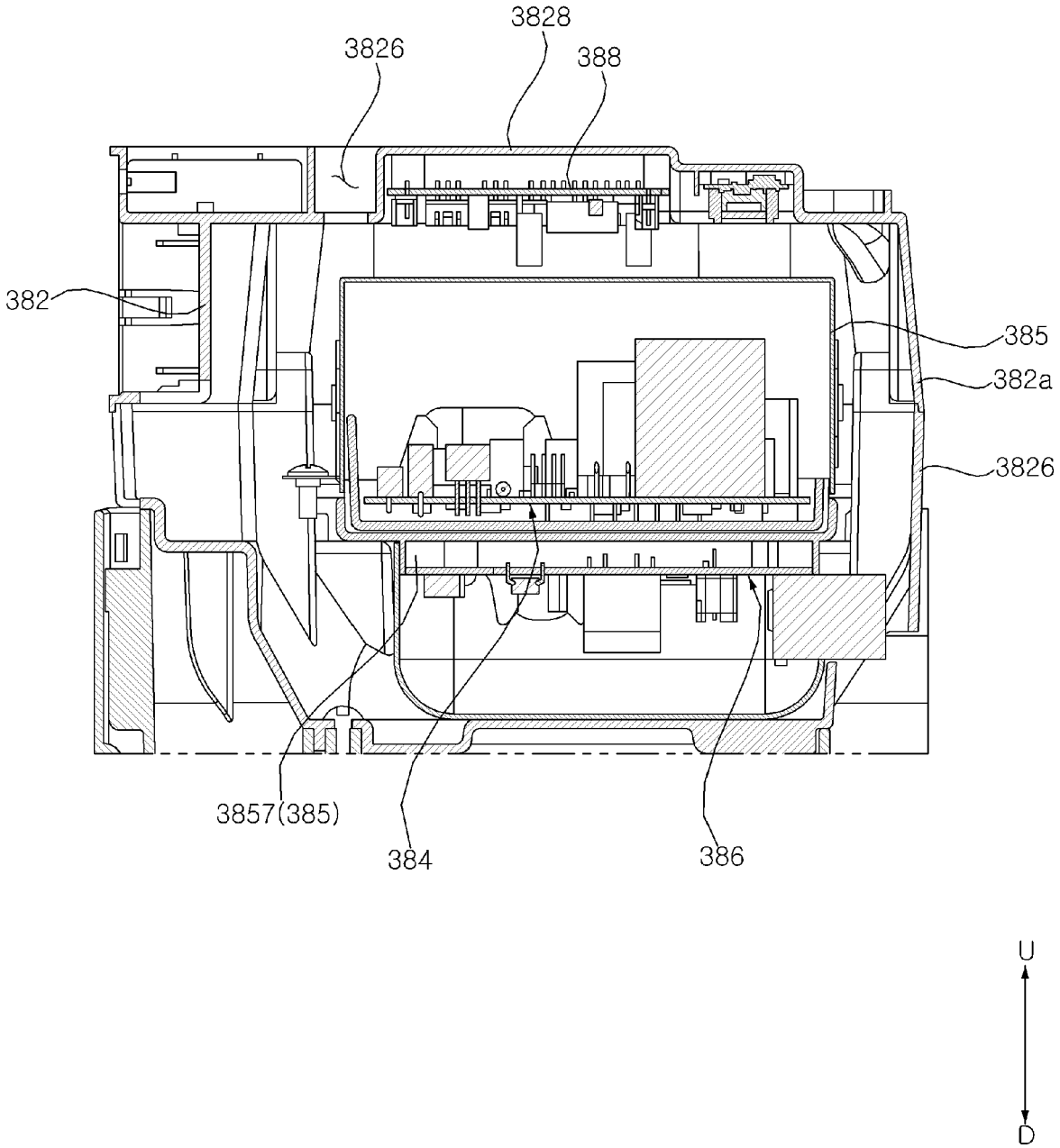
FIG. 14



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EUROPEAN SEARCH REPORT

Application Number
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X	KR 2018 0003217 U (NA) 14 November 2018 (2018-11-14) * paragraph [0020] - paragraph [0034] * * figures *	1	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	5 September 2024	Mattias Grenbäck

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