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(54) **AIR WASHER**

LUFTWÄSCHER

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Description

[0001] The present invention relates to air washers.

[0002] Generally, an air washer is a type of air purifier that rids air of foreign materials by bringing air in contact with water.

[0003] Typical air purifiers come in a filter type that sucks up air, purifies the air through a filter, and discharges the purified air, an electrostatic precipitation type that gathers foreign materials from air through electric discharge for air purification, and a water filtering type that brings air in contact with water to make foreign materials stick to the water and filters the air out.

[0004] The water filtering-type air purifiers come into wide use thanks to eco-friendly characteristics and no additional expenses.

[0005] KR 2012 0075997 A relates to a humidifying air purifier equipped with an ultraviolet lamp including an upper case, a disk assembly, a blowing fan, an ultraviolet lamp, and a connection-combining part. The upper case covers a lower case and forms an air inlet and an air outlet. The disk assembly eliminates dust from air and implements humidification by rotating a plurality of disks. The blowing fan is installed at the upper case and discharges humidified water molecules with air. The ultraviolet lamp is installed at the lower part of the upper case. The ultraviolet lamp irradiates ultraviolet rays to introducing air through the air inlet and water stored in the lower case. The connection-combining part fixes the ultraviolet lamp to the air inlet and supplies power to the ultraviolet lamp.

[Prior Document]

[Patent Document]

[0006] Korean Patent No. 10-1004555

[0007] The present invention provides an air washer having a germicidal lamp capable of killing germs in the water stored in a tank.

[0008] According to an aspect of the present invention, there is proposed an air washer as defined in claim 1. Preferred embodiments are defined in the dependent claims. The air washer comprises a case including an inlet and an outlet, a tank disposed in the case and containing water, the case removably placed on the tank, a blowing fan unit disposed in the case and blowing air through the inlet and the outlet, a disk unit disposed to partially soak in the water contained in the tank and rotating while supported by the tank, a disk driver disposed in the case and rotating the disk unit, a germicidal lamp disposed in the tank and transmitting light to the water in the tank to sterilize the water, and a control box disposed in the case and applying power to the germicidal lamp.

[0009] The tank includes an outer tank; an inner tank spaced apart from the outer tank to form a space, disposed in the outer tank, coupled to the outer tank, and containing the water; and a tank window formed in the inner tank and transmitting the light emitted from the germicidal lamp.

[0010] The germicidal lamp is disposed between the inner tank and the outer tank and transmits the light to the water through the tank window.

[0011] The tank may be shaped as a rectangle at a plan view, and the tank window may be disposed near an edge.

[0012] The germicidal lamp may include a movable electrode projecting to an upper side of the tank, and when the case is placed on the tank, the movable electrode may contact the control box to electrically connect to the control box.

[0013] The movable electrode may be provided to be moved downwards by an external force generated as the case is placed.

[0014] The movable electrode may be elastically supported and brought in tight contact with a side of the case.

[0015] The germicidal lamp may include a lamp case disposed in the tank, a lamp circuit board disposed in the lamp case, and a lamp disposed on the lamp circuit board and electrically powered to generate light for sterilization.

[0016] The tank includes a tank window through which light is transmitted. The lamp case may have an opening in a front surface thereof. The lamp may be provided towards the tank window.

[0017] The tank may include a boss, and the lamp case may include a positioning hole where the boss is inserted to make the tank and the lamp case struck to each other.

[0018] The air washer may further include a lamp electrode formed in the lamp case and contacting the control box to receive power.

[0019] The lamp electrode may include a stationary electrode provided in the lamp case and a movable electrode provided in the stationary electrode and moved relative of the stationary electrode by an external force applied by the case.

[0020] The movable electrode may be provided to pass through the stationary electrode.

[0021] An electrode elastic member may be disposed between the movable electrode and the stationary electrode, and the movable electrode may be elastically supported by the electrode elastic member.

[0022] The movable electrode may include an electrode body moving relative of the stationary electrode, a contact electrode portion formed on an upper side of the electrode body and contacting a connecting electrode electrically

connected with the control box, and a projecting electrode portion formed on a lower side of the electrode body and passing and projecting beyond a lower side of the stationary electrode.

[0023] The electrode body may include a jaw that is stuck to the stationary electrode.

[0024] The air washer may further include an electrode elastic member disposed between the movable electrode and the stationary electrode to provide an elastic force to the movable electrode. The electrode elastic member may elastically support the jaw.

[0025] The projecting electrode portion may be disposed to pass through the electrode elastic member.

[0026] The present invention provides one or more of the following effects:

First, according to the present invention, the air washer has a germicidal lamp capable of killing germs in the tank and may thus suppress generation of harmful germs in the stored water.

Second, according to the present invention, the air washer may sterilize the water contained in the tank, preventing the disk unit from contamination and thus extending the cleaning cycle of the disk unit.

Third, according to the present invention, the lamp electrode of the air washer is backed up by the electrode elastic member, enhancing the reliability of electrical connections while the case is left on place.

Fourth, according to the present invention, the movable electrode of the air washer may be relatively moved up and down while elastically supported by the electrode elastic member, enhancing the reliability of electric connections to the control box.

Fifth, according to the present invention, the electric connection between the control box and the movable electrode of the air washer is disconnected when the case is lifted up, enabling the germicidal lamp to be physically turned off immediately when the case is removed.

Sixth, according to the present invention, the lamp case of the air washer is brought in tight contact with the tank window with the front surface of the lamp case opened, simplifying the structure of the lamp case.

Seventh, according to the present invention, the germicidal lamp of the air washer is positioned between the inner tank and the outer tank, minimizing the occurrence of a short circuit due to water.

[0027] Finally, according to the present invention, the movable electrode of the air washer is provided to pass through the stationary electrode, making it easy for the movable electrode to move straight.

Fig. 1 is a perspective view illustrating an air washer according to a first embodiment of the present invention;

Fig. 2 is a front view of the air washer of Fig. 1;

Fig. 3 is a cross-sectional view taken along line A-A of Fig. 2;

Fig. 4 is a perspective view illustrating an example in which the disk unit of Fig. 3 has been installed;

Fig. 5 is a perspective view illustrating the tank of Fig. 4;

Fig. 6 is a front view illustrating the inside of a germicidal lamp according to the first embodiment of the present invention; and

Fig. 7 is a front, cross-sectional view illustrating the lamp electrode of Fig. 6.

[0028] Hereinafter, the present invention is described in detail with reference to the drawings.

[0029] When determined to make the subject matter of the present invention unclear, the detailed description of known configurations or functions is omitted. It should be noted that the elements may be denoted with different reference numbers although termed the same.

[0030] The terms as used herein are ones defined considering the functions of the present invention and may be varied depending on the intention or custom of users such as experimenters or measurers. Thus, the definitions of the terms should be made in the context throughout the specification.

[0031] The terms "first" and "second" may be used to describe various elements. The elements, however, are not limited to the above terms. In other words, the terms are used only for distinguishing an element from others. Accordingly, a "first element" may be named a "second element," and vice versa. The term "and/or" includes a combination of a plurality of relevant elements as described or any one of a plurality of relevant items as described.

[0032] The terms used herein are used for the illustrative purposes and are not intended to limit the present invention. A singular term includes a plural term unless otherwise stated.

[0033] Unless defined otherwise, all of the terms used herein including technical or scientific terms are the same in meaning as those generally understood by one of ordinary skill in the art to which the present invention pertains. The terms as defined in the dictionary commonly used should be interpreted to comply with the meanings in the context of the related art, and unless clearly defined otherwise, the terms should not be interpreted too formally or ideally.

[0034] As used herein, when an element "comprises" another element, the element may further include the other element unless stated otherwise.

[0035] Fig. 1 is a perspective view illustrating an air washer according to a first embodiment of the present invention.

Fig. 2 is a front view of the air washer of Fig. 1. Fig. 3 is a cross-sectional view taken along line A-A of Fig. 2. Fig. 4 is a perspective view illustrating an example in which the disk unit of Fig. 3 has been installed. Fig. 5 is a perspective view illustrating the tank of Fig. 4. Fig. 6 is a front view illustrating the inside of a germicidal lamp according to the first embodiment of the present invention. Fig. 7 is a front, cross-sectional view illustrating the lamp electrode of Fig. 6.

[0036] According to an embodiment of the present invention, the air washer includes a case 10 having an inlet 11 and an outlet 12, a tank 20 positioned in the case 10, a blowing fan unit 30 positioned in the case 10 and creating an air flow through the inlet 11 and the outlet 12, a disk unit 40 partially soaked in the water stored in the tank 20 and turning around while soaked, a disk driver (not shown) positioned in the case 10 and rotating the disk unit 40, and a germicidal lamp 50 positioned in the tank 20 and sterilizing the water stored in the tank 20.

[0037] In this embodiment, the case 10 includes an outer case 13, an inner case 14, and a bottom case 15.

[0038] The outer case 13 has an opening in its bottom. The outer case 13 may be shaped as a truncated cone. The outer case 13 includes the inlet 11 formed in the outer peripheral surface, the outlet 12 formed in the top surface, and a handle slot 17 formed in the outer peripheral surface.

[0039] In the instant embodiment, an inlet grill 16 is provided to form the inlet 11.

[0040] The bottom case 15 is positioned in the bottom of the outer case 13. The outer case 13 is placed on the bottom case 15.

[0041] The inner case 14 is assembled inside the outer case 13. The blowing fan unit 30, the disk driver, and the control box 60 are installed in the inner case 14.

[0042] The control box 60 is positioned between the outer case 13 and the inner case 14 to cut off contact with air blown by the blowing fan unit 30, thereby minimizing influence by moisture.

[0043] The outer case 13 and the inner case 14 are assembled into a single body. The assembly of the outer case 13 and the inner case 14 is defined as an upper case. The upper case is placed on the bottom case 15. The user may lift up the upper case by way of the handle slot 17.

[0044] The bottom case 15 is used as a base to support the tank 20. The tank 20 is placed on the bottom case 15. The upper case is placed on the bottom case 15 wrapping around the tank. That is, the tank 20 is positioned inside the upper case. The upper case prevents the tank 20 from exposure to the outside. Alternatively, the bottom case 15 may be integrally formed with the tank 20.

[0045] The blowing fan unit 30 is assembled at an upper side of the outer case 13. The blowing fan unit 30 includes a blowing housing 31 forming the outlet 12, a blowing motor 32 coupled to the blowing housing 31, and a blowing fan 34 coupled to the blowing motor 32 and turning around.

[0046] The blowing fan unit 30 is positioned on the disk unit 40.

[0047] The blowing fan unit 30 is positioned inside the inner case 14. A discharge flowpath is formed between the inner case 14 and the blowing fan unit 30 to communicate with the outlet 12.

[0048] The blowing housing 31 forms an upper surface of the case 10. The outlet 12 is positioned in a radius direction outside of the blowing housing 31. The outlet 12 is formed between the blowing housing 31 and the outlet 12.

[0049] The blowing housing 31 further includes a blowing guide 31 forming the outlet 12. The blowing guide 31 guides air flowing upwards from inside the test unit 10 to the outlet 12.

[0050] In this embodiment, the discharge flowpath is formed between the blowing guide 31 and the outlet 12. Here, the blowing guide 31 guides discharged air upwards. The blowing guide 31 is formed to be inclined towards the outside in a radius direction.

[0051] The blowing motor 32 is installed so that its motor shaft is oriented downwards. The blowing fan 34 is positioned under the blowing motor 32 and is coupled with the motor shaft.

[0052] In the present embodiment, a centrifugal fan is used as the blowing fan 34. The blowing fan 34 sucks up air through its center and discharges the air to the outside in a radius direction. Here, the discharged air is moved to the outlet 12.

[0053] The disk unit 40 includes a disk assembly having multiple disks 41 spaced apart at predetermined intervals and assembled in parallel, a disk shaft 42 coupled to the disk assembly and forming a rotational axis, a disk gear 43 coupled to the disk assembly and receiving a rotational force from the disk driver, and a handle 44 coupled to the disk gear 43.

[0054] The plurality of disks 41 of the disk assembly are arranged to stand vertically. The disks 41 are spaced apart from each other at predetermined intervals. Water flows between the disks 41 and contacts the surface of the disks 41.

[0055] The disk driver is engaged with the disk gear 43 to give the disk gear 43 a rotational force that turns around the disk assembly.

[0056] The disk assembly rotates about the center of the disk shaft 42. The disk assembly is exposed to the air as the part soaked in the tank 20 turns upwards. Here, water on the exposed surface of the disks 41 is naturally vaporized, humidifying the air.

[0057] Although not shown, the disk driver is installed in the inner case 14.

[0058] The handle 44 is coupled to the disk shaft 42. The handle 44 is rotated relative to the disk shaft 42, and unless

manipulated, is supported on the top of the tank 20 by its own weight.

[0059] The user may lift up the disk unit 40 from the tank 20 using the handle 44.

[0060] The tank 20 stores water. The tank 20 is seated and installed on the bottom case 15.

[0061] The tank 20 includes an outer tank 22 seated on the bottom case 15, an inner tank 24 coupled inside the outer tank 22 and containing water, and a water level sensing electrode 26 installed in the inner tank 24 to sense the water level of water contained.

[0062] The tank 20 is shaped as a rectangle at top view.

[0063] A space is formed between the outer tank 22 and the inner tank 24. A germicidal lamp 50 is installed in the space.

[0064] The disk unit 40 is supported by the inner tank 24. The disk unit 40 is turned around while supported by the inner tank 24. In this embodiment, the disk shaft 42 is hung by the inner tank 24 and rotates.

[0065] The germicidal lamp 50 is positioned between the inner tank 24 and the outer tank 22.

[0066] Alternatively, the germicidal lamp 50 may be positioned inside the inner tank 24 containing water. In such case, the tank window 25 is omitted. The germicidal lamp 50 needs to be rendered water-proof because it is soaked in water.

[0067] The control unit 20 may be formed of one wall body, and the germicidal lamp 50 may be installed outside the tank 20. Also in such case, light from the germicidal lamp 50 may be transmitted to the water via the tank window 25.

[0068] The germicidal lamp 50 is electrically connected with the control box 60. The lamp electrode 58 of the germicidal lamp 50 is partially exposed to an upper side of the tank 20. The germicidal lamp 50 is electrically connected with the control box 60 through the lamp electrode 58.

[0069] The tank window 25 is formed of a transparent material in a portion of the inner tank 24 to allow light from the germicidal lamp 50 to be transmitted to the inside of the tank. Light emitted from the germicidal lamp 50 passes through the tank window 25 to the water in the inner tank 24.

[0070] The tank window 25 is sealed off to prevent water from percolating into the space between the outer tank 22 and the inner tank 24.

[0071] The tank window 25 is positioned at a lower side inside the control unit 20, and in this embodiment, it is positioned at the side of an inner edge where it may be maximally spaced apart from the disk unit 40. This is why a wavelength of light emitted from the germicidal lamp 50 may deform the disk unit 40.

[0072] The germicidal lamp 50 includes a lamp case 52 installed inside the tank 20, a lamp circuit board 54 positioned inside the lamp case 52, a lamp 56 installed on the lamp circuit board 54 and receiving power to generate certain light for sterilization, and a lamp electrode 58 electrically connected with the lamp circuit board 54 and disposed to partially project beyond the top of the tank 20.

[0073] The lamp 56 may generate a variety of light. In this embodiment, ultraviolet (UV) light is used. The wavelength of light emitted from the lamp 56 is a short wavelength of ultraviolet light (UVC) that is 276nm.

[0074] A wavelength of light emitted from the lamp 56 has a short reach. A wavelength of light emitted from the lamp 56 may decolorize or deform the disk unit 40 and is thus disposed furthest away from the inside of the tank 20.

[0075] It is preferable that the lamp 56 is positioned at as low a level as possible to assure the operation even when the water runs short in the tank 20.

[0076] The lamp case 52 has an opening in its front. Alternatively, the lamp case 52 may be formed so that the whole surface is sealed off.

[0077] The lamp case 52 is installed to tightly contact the outer surface of the inner tank 24. The lamp case 52 is engaged with the inner tank 24 to seal up the inside. The outer surface of the inner tank 24 is shaped to be engaged with the lamp case 52 and has thereon a seal to block water permeation.

[0078] Here, the lamp 56 is disposed at the outside of the tank window 25.

[0079] A positioning hole 53 is formed in an edge of the lamp case 52 for easier assembly into the tank 20.

[0080] The positioning hole 53 is fitted into a boss 23 formed in the tank 20. The user may intuitively identify the position of installation of the lamp case 22 through the positioning hole 53.

[0081] The lamp case 22 is moved horizontally and assembled into the boss 23. After the assembly of the lamp case 22 and the boss 23, the vertical movement of the lamp case 22 is restricted.

[0082] The lamp electrode 58 is a component to electrically connect the control box 60 with the lamp circuit board 54. Since the tank 20 and the upper case may be taken apart from each other, they are electrically connected with each other via the lamp electrode 58 only when coupled.

[0083] On the bottom surface of the upper case 10 is formed a connecting electrode (not shown) contacting the lamp electrode 58, which is electrically connected with the control box 60.

[0084] In this embodiment, the connecting electrode is formed in the inner case 14. The structure for electrical connection is known to one of ordinary skill in the art, and no detailed description is given.

[0085] The germicidal lamp 50 should be installed in the tank 20 to sterilize the water in the tank 20 and is operated only when in electrical connection with the control box 60.

[0086] When the tank 20 and the case 10 are coupled with each other, the electrical connection needs to be reliable to operate the germicidal lamp 50.

[0087] In this embodiment, thus, the lamp electrode 58 is configured to always remain in tight contact with the side of the case 10.

[0088] The lamp electrode 58 is elastically supported to tightly contact the connecting electrode of the case 10. The lamp electrode 58 receives an elastic force through an electrode elastic member 51, which pushes up.

[0089] The lamp electrode 58 is installed in the lamp case 52 and its length may be varied when forced from the outside. The lamp electrode 58 is left in contact by the elastic force.

[0090] The lamp electrode 58 may be installed to move relative of the lamp case 52. In the instant embodiment, such structure is applied that the lamp electrode 58 is subject to a change in length rather than relatively moved when an external force is exerted to the lamp electrode 58.

[0091] The lamp electrode 58 includes a stationary electrode 57 provided in the lamp case 52, a movable electrode 70 provided inside the stationary electrode 57 and moved relative of the stationary electrode 57, and an electrode elastic member 51 positioned between the stationary electrode 57 and the movable electrode 70 and providing an elastic force to the movable electrode 70.

[0092] The movable electrode 70 is formed to pass through the stationary electrode 57. The movable electrode 70 and the stationary electrode 57 are stuck to each other, preventing separation therebetween.

[0093] Upon manufacture of the lamp electrode 58, at least one of the stationary electrode 57 or the movable electrode 70 may be bent so that they are stuck to each other, thereby preventing separation of the stationary electrode 57 and the movable electrode 70.

[0094] A through hole is formed from the top of the stationary electrode 57 to bottom. The movable electrode 70 passes through the movable electrode 70.

[0095] The movable electrode 70 includes an electrode body 72 moving relative of the stationary electrode 57, a contact electrode portion 74 formed on the top of the electrode body 72 and contacting the connecting electrode electrically connected with the control box 60, a projecting electrode portion 76 formed on the bottom of the electrode body 72 and passing and projecting beyond the bottom of the stationary electrode 57, and a jaw 78 formed in the electrode body 72 and stuck to the stationary electrode 57.

[0096] The contact electrode portion 74 is thicker than the projecting electrode portion 76.

[0097] The contact electrode portion 74 extends beyond the top of the stationary electrode 57, exposed to the outside. An external force is applied to the contact electrode portion 74. The external force applied pushes the contact electrode portion 74 into the inside of the stationary electrode 57.

[0098] The jaw 78 is formed at a lower side of the contact electrode portion 74. The jaw 78 is formed to project to the outside of the electrode body 72. The jaw 78 is stuck to an inner upper portion of the stationary electrode 57. The jaw 78 is stuck, restricting the movement of the movable electrode 70.

[0099] The jaw 78 functions as a stopper.

[0100] The projecting electrode portion 76 passes beyond the bottom of the stationary electrode 57 and is exposed.

[0101] The projecting electrode portion 76 is implemented to make it easier for the movable electrode 70 to move straight.

[0102] Omission of the projecting electrode portion 76 might cause the movable electrode 70 to be stuck, staggering inside the stationary electrode 57. The projecting electrode portion 76 guides the straight movement of the movable electrode 70.

[0103] Hence, the projecting electrode portion 76 extends long in the direction that the movable electrode 70 moves.

[0104] The electrode elastic member 51 has the bottom supported by the stationary electrode 57 and the top supported by the jaw 78.

[0105] The projecting electrode portion 76 is disposed to pass through the electrode elastic member 51.

[0106] The electrode elastic member 51 may be a coil spring. Alternatively, the electrode elastic member 51 may be other various types of springs.

[0107] The lamp circuit board 54 and the lamp electrode 58 may be electrically connected with each other via diverse means.

[0108] In this embodiment, the stationary electrode 57 and the lamp circuit board 54 may be electrically connected through an electric wire. Since the electrode elastic member 51 remains in contact with the stationary electrode 57 and the movable electrode 70, a structure to connect the stationary electrode 57 with the lamp circuit board 54 is preferable. When the stationary electrode 57 and the lamp circuit board 54 are electrically connected with each other, the electric wire does not move even when the movable electrode 70 causes a relative movement.

[0109] As another example, although not shown, an electric connection may be made between the projecting electrode portion 76 and the lamp circuit board 54 through an electric wire.

[0110] In the instant embodiment, the electrode elastic member 51 gives the movable electrode 70 an electric force, while supported by the stationary electrode 57. The lamp electrode 58 features that, when forced from the outside, it is relatively moved while maintaining the contact against the external force.

[0111] For instance, the electrode elastic member 51 may be provided to be supported against the side of the case

10 to give the movable electrode 70 an elastic force.

[0112] The lamp electrode 58 may be made in the form of a leaf spring that allows it to remain in contact with the connecting electrode by its elasticity.

[0113] When the case 10 is placed on the tank 20, the case 10 pushes and descends the movable electrode 70. Here, the connecting electrode (not shown) and the lamp electrode 58 formed inside the case 10 remain in contact.

[0114] When the case 10 is removed from the tank 20, the movable electrode 70 is ascended by the electrode elastic member 51.

[0115] The movable electrode 70 may maintain the electric connection with the control box 60 while moving up and down with respect to the stationary electrode 57.

[0116] The movable electrode 70 increases the freedom of design for tolerance in assembly or a gap that arises upon assembly of the tank 20 and the case 10.

[0117] Since the germicidal lamp 50 is powered off the moment the user separates the case 10 and the tank 20, damage to the user due to the light from the lamp 56 may be prevented. The power-on/off of the lamp 56 is implemented by a physical connecting structure, and it does not cause any malfunction.

[Description of Elements]

10:	case	11:	inlet
12:	outlet	13:	outer case
14:	inner case	15:	bottom case
20:	tank	22:	outer tank
24:	inner tank	25:	tank window
30:	blowing fan unit	31:	blowing housing
32:	blowing motor	33:	blowing guide
34:	blowing fan	40:	disk unit
41:	disk	42:	disk shaft
43:	disk gear	44:	handle
50:	germicidal lamp	51:	electrode elastic member
52:	lamp case	53:	positioning hole
54:	lamp circuit board	56:	lamp
57:	stationary electrode	60:	control box
70:	movable electrode	72:	electrode body
74:	contact electrode portion	76:	projecting electrode portion
78:	jaw		

Claims

1. An air washer, comprising:

a case (10) including an inlet (11) and an outlet (12):

a tank (20) disposed in the case and containing water, the case (10) removably placed enclosing the tank (20);

a blowing fan unit (30) disposed in the case and blowing air through the inlet (11) and the outlet (12);

a disk unit (40) disposed to partially soak in the water contained in the tank (20) and rotating while supported by the tank (20);

a disk driver disposed in the case (10) and rotating the disk unit (40);

a germicidal lamp (50) disposed in the tank (20) and transmitting light to the water in the tank (20) to sterilize the water; and

a control box (60) disposed in the case (10) and applying power to the germicidal lamp (50),

wherein the tank (20) includes:

an outer tank (22);

an inner tank (24) spaced apart from the outer tank (22) to form a space, disposed in the outer tank (22), coupled to the outer tank (22), and containing the water;

a tank window (25) disposed in the inner tank (24), and transmitting the light emitted from the germicidal

lamp (50) to sterilize the water, wherein the germicidal lamp is disposed between the inner tank and the outer tank and transmits the light to the water through the tank window.

2. The air washer of claim 1, wherein the tank (20) is shaped as a rectangle at a plan view, and wherein the tank window (25) is disposed near an edge.

3. The air washer of claim 1 or 2, wherein the germicidal lamp (50) includes a movable electrode (70) projecting to an upper side of the tank (20), and wherein when the case (10) is placed on the tank (20), the movable electrode (70) contacts the control box (60) and electrically connects to the control box (60).

4. The air washer of claim 3, wherein the movable electrode (70) is provided to be moved downwards by an external force generated as the case (10) is placed.

5. The air washer of claim 4, wherein the movable electrode (70) is elastically supported and brought in tight contact with a side of the case (10).

6. The air washer of claim 1, wherein the germicidal lamp (50) includes:

a lamp case (52) disposed in the tank;
a lamp circuit board (54) disposed in the lamp case; and
a lamp (56) disposed on the lamp circuit board and electrically powered to generate light for sterilization.

7. the air washer of claim 6, wherein the lamp case (52) has an opening in a front surface thereof, and wherein the lamp (50) is provided towards the tank window (25).

8. The air washer of claim 6, wherein the tank includes a boss (23), and the lamp case (52) includes a positioning hole (53) where the boss (23) is inserted to make the tank (20) and the lamp case (52) struck to each other.

9. The air washer of claim 6, further comprising a lamp electrode provided in the lamp case (52) and contacting the control box (60) to receive power.

10. The air washer of claim 9, wherein the lamp electrode includes:

a stationary electrode (57) provided in the lamp case (52); and
a movable electrode (70) provided in the stationary electrode (57) and moved relative of the stationary electrode (57) by an external force applied by the case (52).

11. The air washer of claim 10, wherein the movable electrode (70) is provided to pass through the stationary electrode (57).

12. The air washer of claim 10 or 11, wherein an electrode elastic member (51) is disposed between the movable electrode (70) and the stationary electrode (57), and wherein the movable electrode (70) is elastically supported by the electrode elastic member (51).

13. The air washer of claim 10, 11 or 12, wherein the movable electrode (70) includes:

an electrode body (72) moving relative of the stationary electrode (57);
a contact electrode portion (74) formed on an upper side of the electrode body (72) and contacting a connecting electrode electrically connected with the control box (60); and
a projecting electrode portion (76) formed on a lower side of the electrode body (72) and passing and projecting beyond a lower side of the stationary electrode (57).

14. The air washer of claim 13, wherein the electrode body (72) includes a jaw (78) that is stuck to the stationary electrode (57).

15. The air washer of claim 13 or 14, further comprising an electrode elastic member (51) disposed between the movable electrode (70) and the stationary electrode (57) to provide an elastic force to the movable electrode (70), wherein

the electrode elastic member (51) elastically supports the jaw (78).

16. The air washer of claim 15, wherein the projecting electrode portion is disposed to pass through the electrode elastic member (51).

Patentansprüche

1. Luftwäscher mit:

einem Gehäuse (10) mit einem Einlass (11) und einem Auslass (12);
 einem Behälter (20), der im Gehäuse angeordnet ist und Wasser enthält, wobei das Gehäuse (10) entferntbar angeordnet ist und den Behälter (20) umschließt;
 einer im Gehäuse angeordneten Gebläseeinheit (30), die Luft durch den Einlass (11) und den Auslass (12) bläst;
 einer Scheibeneinheit (40), die dazu eingerichtet ist, im Behälter (20) enthaltenes Wasser teilweise anzusaugen, und sich dreht, während sie durch den Behälter (20) getragen wird;
 einer im Gehäuse (10) angeordneten Scheibenantriebseinrichtung, die die Scheibeneinheit (40) dreht;
 einer Germizidlampe (50), die im Behälter (20) angeordnet ist und Licht zum Wasser im Behälter (20) überträgt, um das Wasser zu sterilisieren; und
 einem Schaltkasten (60), der im Gehäuse (10) angeordnet ist und der Germizidlampe (50) Strom zuführt, wobei der Behälter (20) aufweist:

einen Außenbehälter (22);
 einen Innenbehälter (24), der von dem Außenbehälter (22) beabstandet ist, um einen Raum zu bilden, und der im Außenbehälter (22) angeordnet ist, mit dem Außenbehälter (22) gekoppelt ist und das Wasser enthält;
 ein Behälterfenster (25), das im Innenbehälter (24) angeordnet ist und das von der Germizidlampe (50) emittierte Licht überträgt, um das Wasser zu sterilisieren, wobei
 die Germizidlampe zwischen dem Innenbehälter und dem Außenbehälter angeordnet ist und das Licht durch das Behälterfenster zum Wasser überträgt.

2. Luftwäscher nach Anspruch 1, wobei der Behälter (20) in einer Draufsicht betrachtet als Rechteck geformt ist, und wobei das Behälterfenster (25) in der Nähe eines Randes angeordnet ist.

3. Luftwäscher nach Anspruch 1 oder 2, wobei die Germizidlampe (50) eine bewegliche Elektrode (70) aufweist, die zu einer Oberseite des Behälters (20) hervorsteht, und wobei das Gehäuse (10) auf dem Behälter (20) angeordnet ist, die bewegliche Elektrode (70) mit dem Schaltkasten (60) in Kontakt steht und mit dem Schaltkasten (60) elektrisch verbunden ist.

4. Luftwäscher nach Anspruch 3, wobei die bewegliche Elektrode (70) derart angeordnet ist, dass sie durch eine äußere Kraft, die erzeugt wird, wenn das Gehäuse (10) platziert wird, nach unten bewegt wird.

5. Luftwäscher nach Anspruch 4, wobei die bewegliche Elektrode (70) elastisch getragen wird und in engen Kontakt mit einer Seite des Gehäuses (10) gebracht wird.

6. Luftwäscher nach Anspruch 1, wobei die Germizidlampe (50) aufweist:

ein im Behälter angeordnetes Lampengehäuse (52);
 eine im Lampengehäuse angeordnete Lampenplatine (54); und
 eine Lampe (56), die auf der Lampenplatine angeordnet ist und mit elektrischem Strom versorgt wird, um Licht für eine Sterilisierung zu erzeugen.

7. Luftwäscher nach Anspruch 6, wobei das Lampengehäuse (52) eine Öffnung in einer Vorderfläche davon aufweist, und wobei die Lampe (50) in Richtung zum Behälterfenster (25) angeordnet ist.

8. Luftwäscher nach Anspruch 6, wobei der Behälter einen Vorsprung (23) aufweist und das Lampengehäuse (52) ein Positionierungsloch (53) aufweist, in das der Vorsprung (23) eingesetzt wird, um zu veranlassen, dass der Behälter (20) und das Lampengehäuse (52) aneinander anliegen.

9. Luftwäscher nach Anspruch 6, ferner mit einer Lampenelektrode, die im Lampengehäuse (52) angeordnet ist und mit dem Schaltkasten (60) in Kontakt steht, um Versorgungsstrom zu empfangen.

10. Luftwäscher nach Anspruch 9, wobei die Lampenelektrode aufweist:

eine im Lampengehäuse (52) angeordnete stationäre Elektrode (57); und
eine bewegliche Elektrode (70), die in der stationären Elektrode (57) vorgesehen ist und durch eine durch das Gehäuse (52) ausgeübte äußere Kraft relativ zur stationären Elektrode (57) bewegt wird.

11. Luftwäscher nach Anspruch 10, wobei die bewegliche Elektrode (70) derart angeordnet ist, dass sie sich durch die stationäre Elektrode (57) erstreckt.

12. Luftwäscher nach Anspruch 10 oder 11, wobei ein elastisches Elektrodenelement (51) zwischen der beweglichen Elektrode (70) und der stationären Elektrode (57) angeordnet ist, und wobei die bewegliche Elektrode (70) durch das elastische Elektrodenelement (51) elastisch getragen wird.

13. Luftwäscher nach Anspruch 10, 11 oder 12, wobei die bewegliche Elektrode (70) aufweist:

einen Elektrodenkörper (72), der sich relativ zur stationären Elektrode (57) bewegt;
einen Kontaktelektrodenabschnitt (74), der auf einer Oberseite des Elektrodenkörpers (72) ausgebildet ist und mit einer mit dem Schaltkasten (60) elektrisch verbundenen Verbindungselektrode in Kontakt steht; und
einen hervorstehenden Elektrodenabschnitt (76), der auf einer Unterseite des Elektrodenkörpers (72) ausgebildet ist und sich von einer Unterseite der stationären Elektrode (57) erstreckt und davon hervorsteht.

14. Luftwäscher nach Anspruch 13, wobei der Elektrodenkörper (72) eine Backe (78) aufweist, die an der stationären Elektrode (57) anliegt.

15. Luftwäscher nach Anspruch 13 oder 14, ferner mit einem elastischen Elektrodenelement (51), das zwischen der beweglichen Elektrode (70) und der stationären Elektrode (57) angeordnet ist, um eine elastische Kraft für die bewegliche Elektrode (70) bereitzustellen, wobei das elastische Elektrodenelement (51) die Backe (78) elastisch hält.

16. Luftwäscher nach Anspruch 15, wobei der hervorstehende Elektrodenabschnitt derart angeordnet ist, dass er sich durch das elastische Elektrodenelement (51) erstreckt.

Revendications

1. Purificateur d'air, comprenant :

un boîtier (10) comportant une entrée (11) et une sortie (12) ;
un réservoir (20) disposé dans le boîtier et contenant de l'eau, le boîtier (10) placé de manière amovible renfermant le réservoir (20) ;
une unité soufflante (30) disposée dans le boîtier et soufflant de l'air à travers l'entrée (11) et la sortie (12) ;
une unité à disques (40) disposée de manière à tremper partiellement dans l'eau contenue dans le réservoir (20) et tournant tout en étant supportée par le réservoir (20) ;
un dispositif d'entraînement de disque disposé dans le boîtier (10) et faisant tourner l'unité à disques (40) ;
une lampe germicide (50) disposée dans le réservoir (20) et transmettant de la lumière à l'eau du réservoir (20) pour stériliser l'eau ; et
une boîte de commande (60) disposée dans le boîtier (10) et appliquant de l'énergie à la lampe germicide (50), dans lequel le réservoir (20) comporte :

un réservoir externe (22) ;
un réservoir interne (24) séparé du réservoir externe (22) pour former un espace,
disposé dans le réservoir externe (22), couplé au réservoir externe (22) et contenant l'eau ;
un hublot de réservoir (25) disposé dans le réservoir interne (24), et transmettant la lumière émise par la lampe germicide (50) pour stériliser l'eau, dans lequel
la lampe germicide est disposée entre le réservoir interne et le réservoir externe et transmet la lumière à l'eau à travers le hublot de réservoir.

2. Purificateur d'air selon la revendication 1, dans lequel le réservoir (20) est en forme de rectangle dans une vue en plan, et dans lequel le hublot de réservoir (25) est disposé à proximité d'un bord.
- 5 3. Purificateur d'air selon les revendications 1 ou 2, dans lequel la lampe germicide (50) comporte une électrode mobile (70) faisant saillie vers un côté supérieur du réservoir (20), et dans lequel lorsque le boîtier (10) est placé sur le réservoir (20), l'électrode mobile (70) vient en contact avec la boîte de commande (60) et est reliée électriquement à la boîte de commande (60).
- 10 4. Purificateur d'air selon la revendication 3, dans lequel l'électrode mobile (70) est prévue pour être déplacée vers le bas par une force extérieure générée au moment où le boîtier (10) est placé.
- 5 5. Purificateur d'air selon la revendication 4, dans lequel l'électrode mobile (70) est supportée élastiquement et mise en contact étroit avec un côté du boîtier (10).
- 15 6. Purificateur d'air selon la revendication 1, dans lequel la lampe germicide (50) comporte :

un boîtier de lampe (52) disposé dans le réservoir ;
un circuit imprimé de lampe (54) disposé dans le boîtier de lampe ; et
20 une lampe (56) disposée sur le circuit imprimé de lampe et alimentée électriquement pour générer de la lumière pour la stérilisation.
7. Purificateur d'air selon la revendication 6, dans lequel le boîtier de lampe (52) présente une ouverture dans sa surface avant, et dans lequel la lampe (50) est prévue vers le hublot de réservoir (25).
- 25 8. Purificateur d'air selon la revendication 6, dans lequel le réservoir comporte un bossage (23), et le boîtier de lampe (52) comporte un trou de positionnement (53) où le bossage (23) est inséré afin que le réservoir (20) et le boîtier de lampe (52) soient collés l'un à l'autre.
- 30 9. Purificateur d'air selon la revendication 6, comprenant en outre une électrode de lampe prévue dans le boîtier de lampe (52) et venant en contact avec la boîte de commande (60) pour recevoir de l'énergie.
10. Purificateur d'air selon la revendication 9, dans lequel l'électrode de lampe comporte :

une électrode fixe (57) prévue dans le boîtier de lampe (52) ; et
35 une électrode mobile (70) prévue dans l'électrode fixe (57) et déplacée par rapport à l'électrode fixe (57) par une force extérieure appliquée par le boîtier (52).
11. Purificateur d'air selon la revendication 10, dans lequel l'électrode mobile (70) est prévue pour passer à travers l'électrode fixe (57).
- 40 12. Purificateur d'air selon les revendications 10 ou 11, dans lequel un élément élastique d'électrode (51) est disposé entre l'électrode mobile (70) et l'électrode fixe (57), et dans lequel l'électrode mobile (70) est supportée élastiquement par l'élément élastique d'électrode (51).
- 45 13. Purificateur d'air selon les revendications 10, 11 ou 12, dans lequel l'électrode mobile (70) comporte :

un corps d'électrode (72) mobile par rapport à l'électrode fixe (57) ;
une partie d'électrode à contact (74) formée sur un côté supérieur du corps d'électrode (72) et venant en contact
50 avec une électrode de liaison reliée électriquement à la boîte de commande (60) ; et
une partie d'électrode en saillie (76) formée sur un côté inférieur du corps d'électrode (72) et traversant et faisant saillie au-delà d'un côté inférieur de l'électrode fixe (57).
14. Purificateur d'air selon la revendication 13, dans lequel le corps d'électrode (72) comporte une mâchoire (78) qui est collée à l'électrode fixe (57).
- 55 15. Purificateur d'air selon les revendications 13 ou 14, comprenant en outre un élément élastique d'électrode (51) disposé entre l'électrode mobile (70) et l'électrode fixe (57) pour fournir une force élastique à l'électrode mobile (70), dans lequel l'élément élastique d'électrode (51) supporte élastiquement la mâchoire (78).

- 16.** Purificateur d'air selon la revendication 15, dans lequel la partie d'électrode en saillie est disposée de manière à passer à travers l'élément élastique d'électrode (51).

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Fig. 1

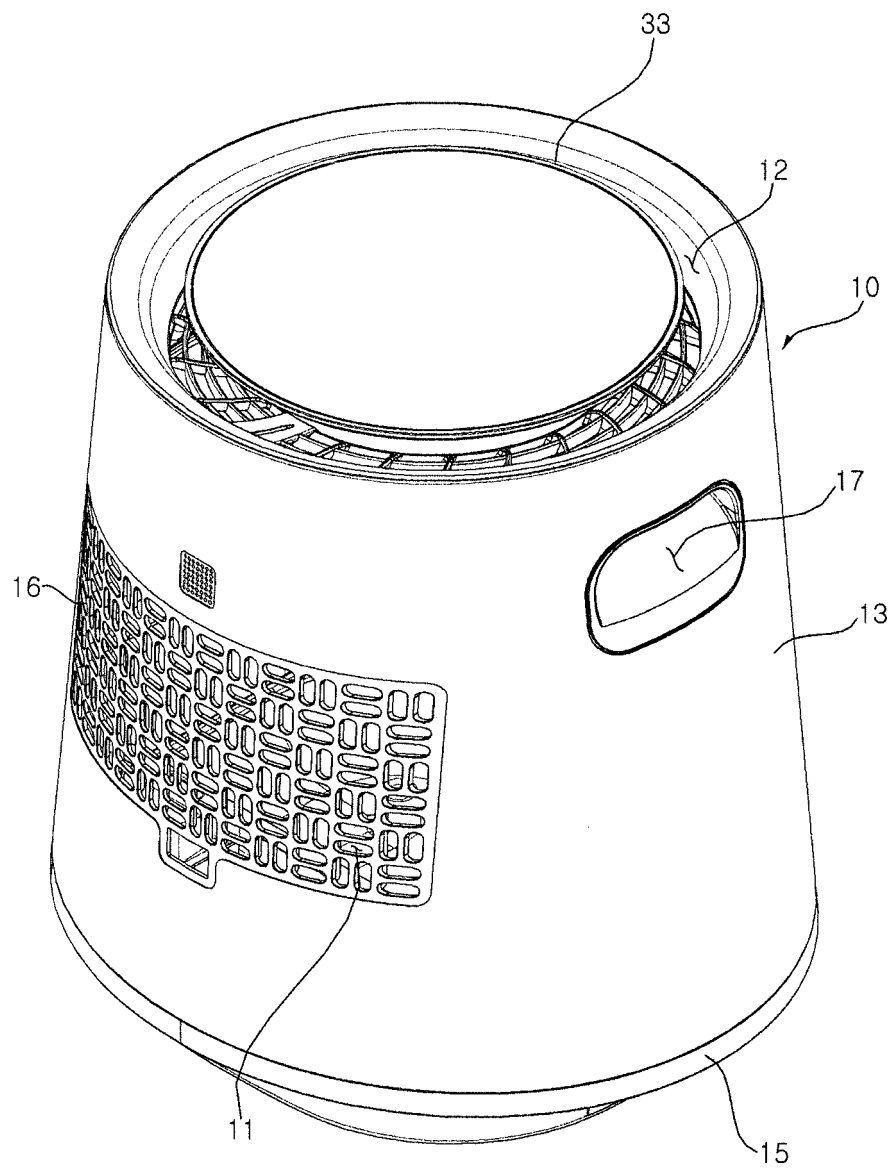


Fig. 2

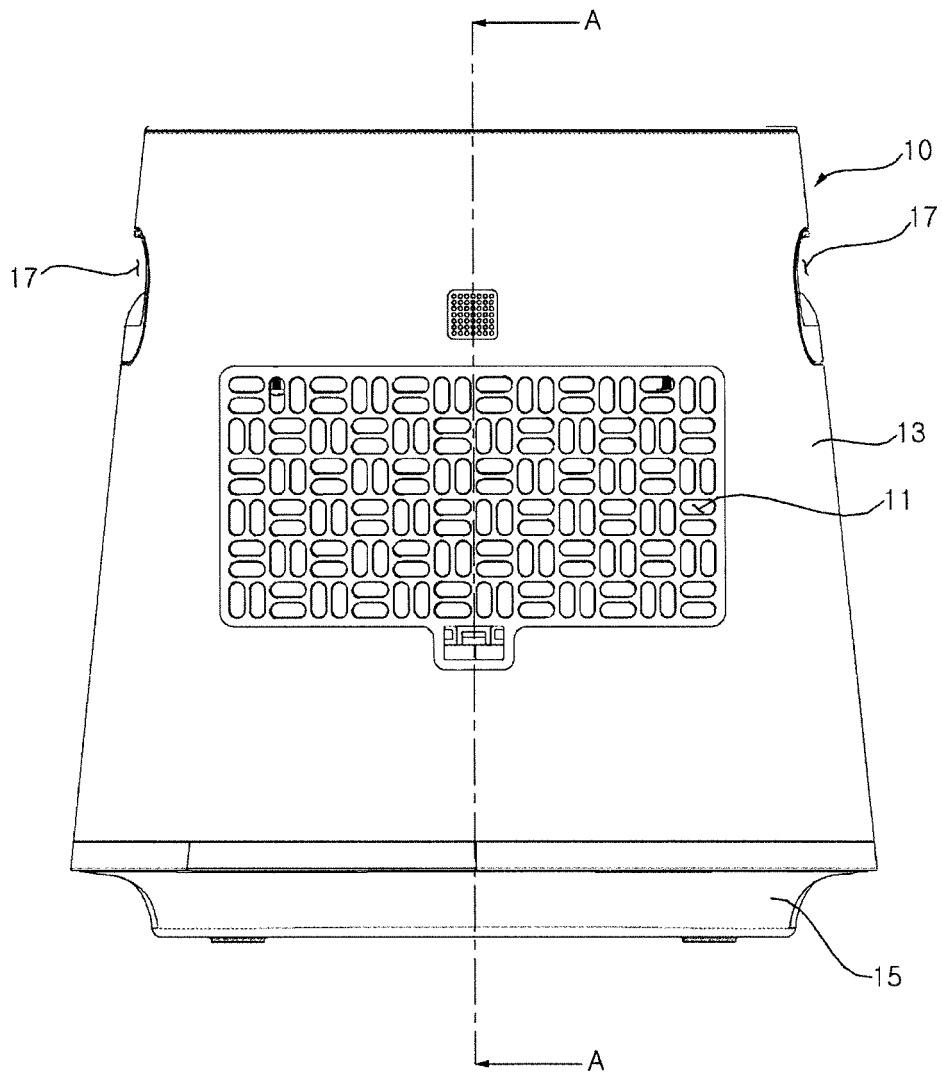


Fig. 3

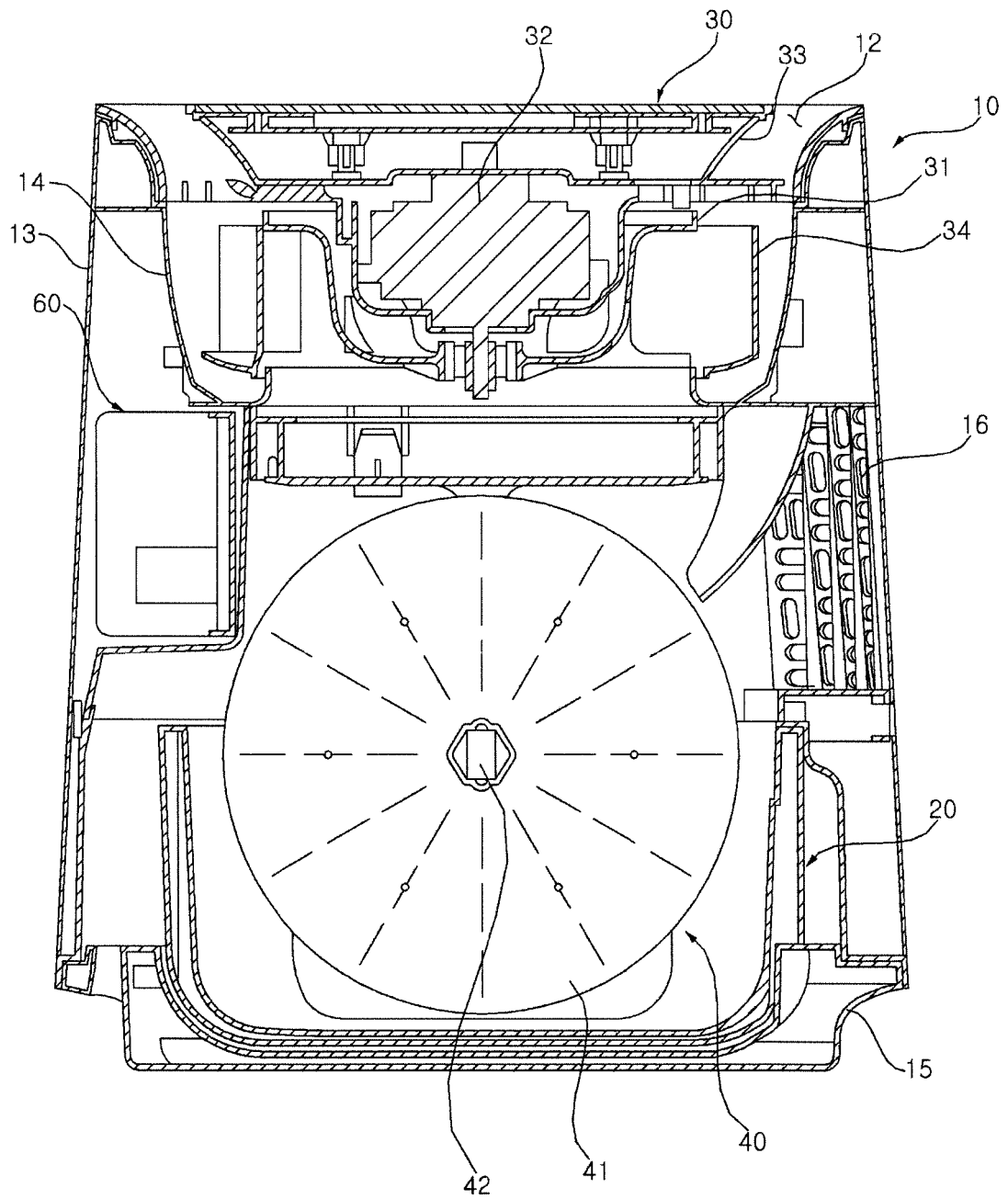


Fig. 4

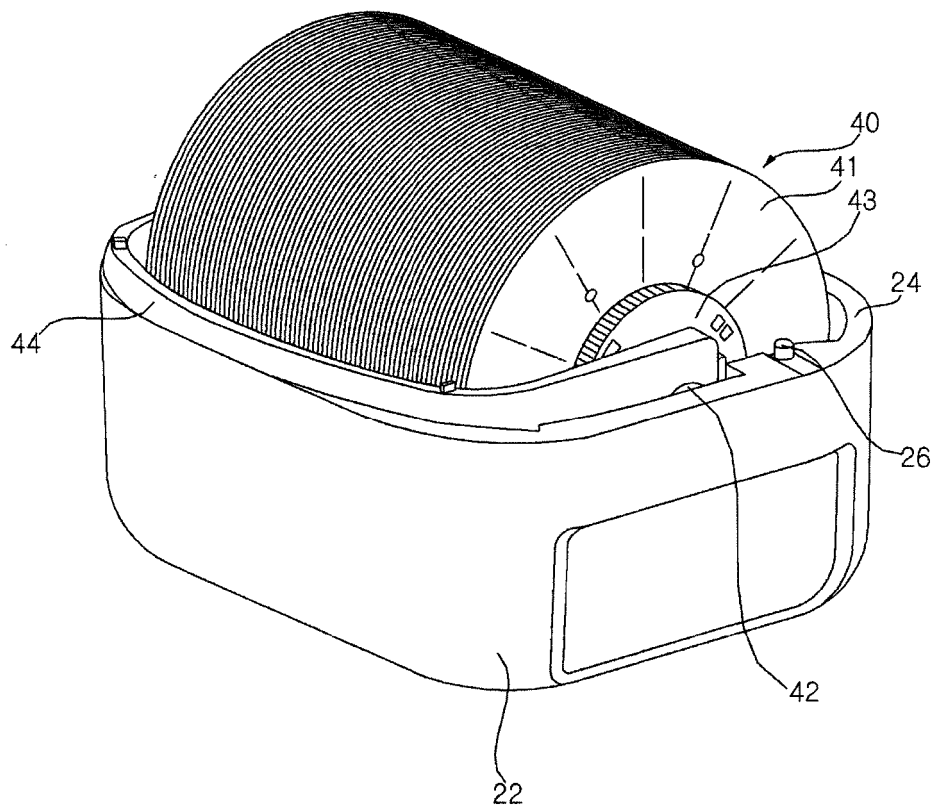


Fig. 5

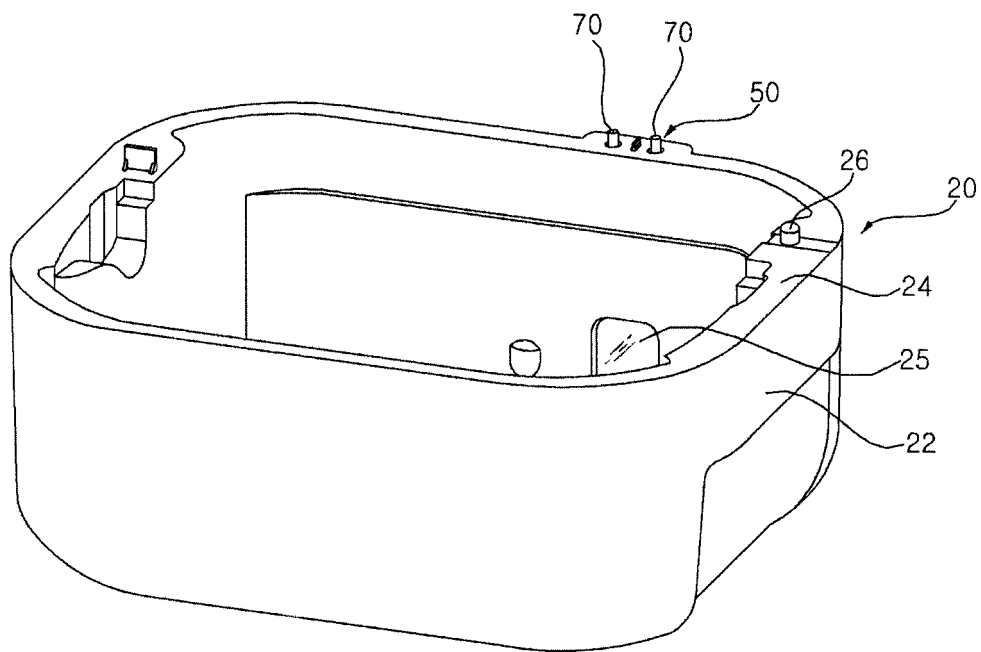


Fig. 6

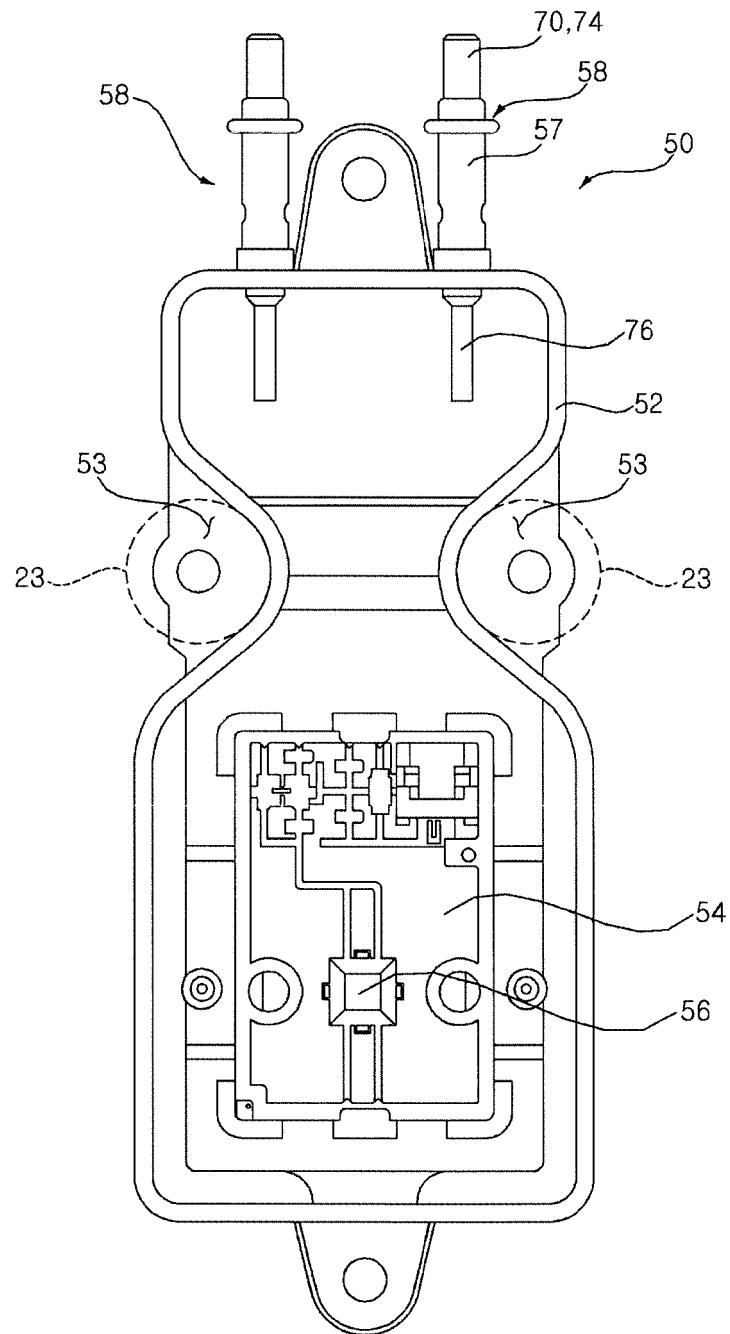
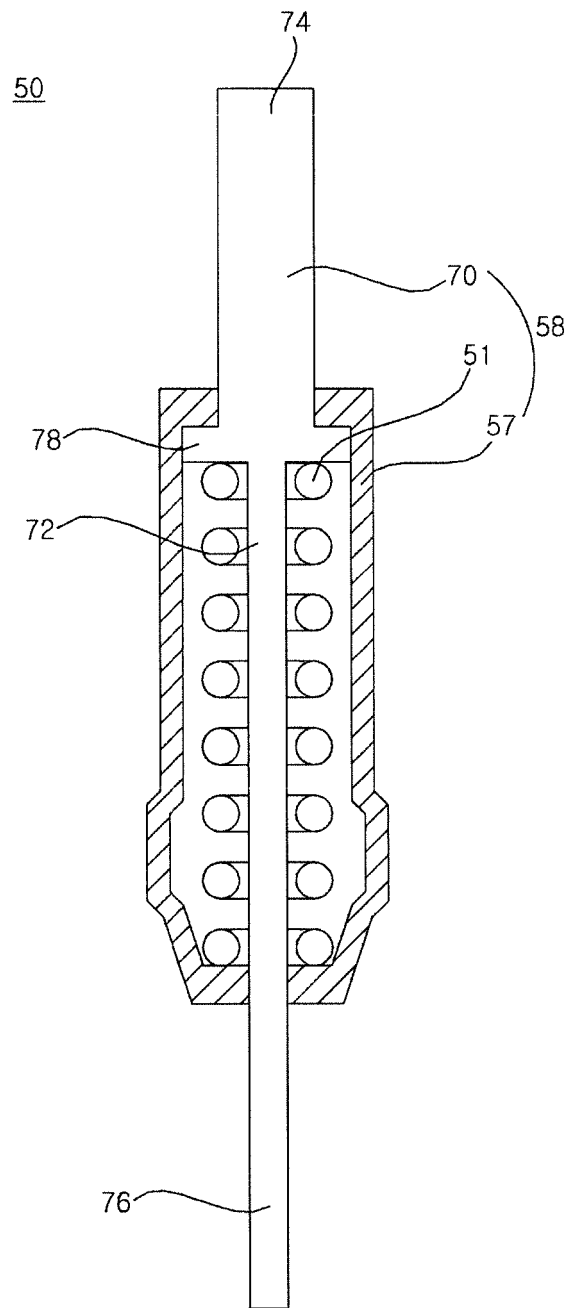


Fig. 7



REFERENCES CITED IN THE DESCRIPTION

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