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(71) Applicants:
• **SANYO ELECTRIC CO., LTD.**
Moriguchi-shi, Osaka-fu (JP)
• **SANYO AIR-CONDITIONERS CO., LTD.**
Ora-gun,
Gunma-ken (JP)

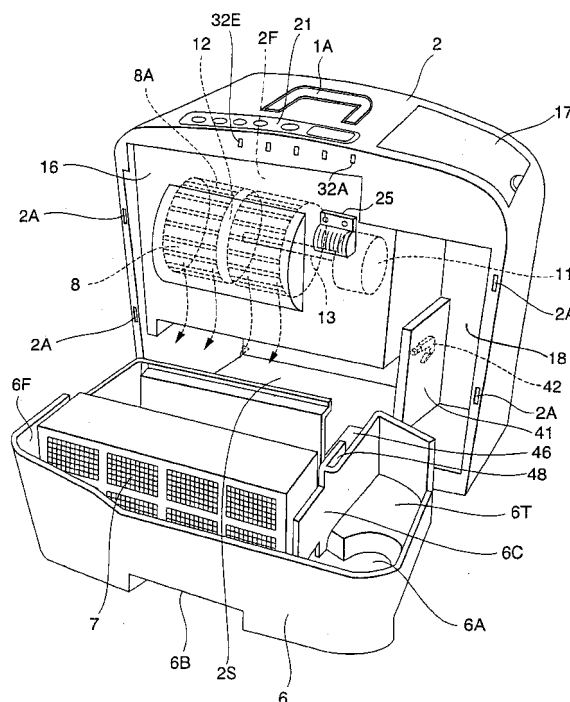
(72) Inventors:
• **Kumaki, Hiroto**
Ora-gun, Gunma (JP)
• **Kon, Masato**
Gunma-ken (JP)
• **Okada, Hideo**
Ota-shi
Gunma-ken (JP)

(74) Representative: **Leitner, Waldemar et al**
Zerrennerstrasse 23-25
75172 Pforzheim (DE)

(54) **Humidifier**

(57) A humidifier comprises a humidifier body (2). A water tray housing section (2S) is formed in the humidifier body. A water tray (6) is detachably housed in the water tray housing section. A humidifying filter (7) is located in the water tray and at least partly immersed into water. A fan (8) is arranged to outward discharge air humidified through the humidifying filter. A plurality of electrodes (40A, 40B, 40C) are provided in the humidifier body and at least partly immersed into water in the water tray. An interlock mechanism (R) is operative to immerse the plurality of electrodes into water in the water tray when the water tray is housed in the water tray housing section and isolate the plurality of electrodes from water in the water tray when the water tray is drawn out of the water tray housing section.

Fig. 4



Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a humidifier of the type that includes a water tray for storing humidifying water therein, which is detachably housed in a water tray housing section formed in a humidifier body. More particularly, it relates to a humidifier equipped with a plurality of electrodes for sterilizing water in the water tray and detecting a water level in the water tray.

Description of the Related Art

[0002] A conventional humidifier may include a humidifier body having an air sucking inlet and an air blowing outlet formed thereon. A water tank is provided in a lower portion of the humidifier body. A fan and a humidifying filter are located in a draft path that connects the sucking inlet and the blowing outlet. In such the humidifier, electrodes may be provided for sterilizing water in the water tank and water level detecting (see Patent Document 1: JP-A 2003-35443, for example).

SUMMARY OF THE INVENTION

[0003] The humidifier disclosed in the above Patent Document 1 is structured to include an auxiliary water tank formed in part of the water tank, with sterilizing electrodes and water level detecting electrodes attached by a holder and wired. In this structure, the water tray is integrated with the humidifier body and is not structured removable therefrom. Accordingly, deeper portions in the water tray are hardly cleaned.

[0004] The present invention has been made in consideration of such the situation. It has an object to achieve works such as cleaning of a water tray with safety even in a structure that makes a humidifying water storage water tray removable from a humidifier body for easy cleaning of the water tray, with a plurality of electrodes immersed into water.

[0005] In a first aspect the invention provides a humidifier, which comprises a humidifier body; a water tray housing section formed in the humidifier body; a water tray detachably housed in the water tray housing section; a humidifying filter located in the water tray and at least partly immersed into water; a fan arranged to outwardly discharge air humidified through the humidifying filter; a plurality of electrodes provided in the humidifier body and at least partly immersed into water in the water tray; and an interlock mechanism operative to immerse the plurality of electrodes into water in the water tray when the water tray is housed in the water tray housing section and isolate the plurality of electrodes from water in the water tray when the water tray is drawn out of the water tray housing section.

[0006] In a second aspect of the invention, the plurality of electrodes include sterilizing electrodes for sterilizing water in the water tray.

[0007] In a third aspect of the invention, the plurality of electrodes include sterilizing electrodes for sterilizing water in the tray and water level detecting electrodes for detecting a water level of water in the water tray.

[0008] In a fourth aspect of the invention, the interlock mechanism includes an electrode holder having one end for holding the plurality of electrodes and the other end impinging on part of the water tray; a shaft rotatably supporting the midsection of the electrode holder; and a spring for driving the electrode holder to always rotate the electrodes upward.

[0009] In a fifth aspect of the invention, the electrode holder is formed to have an electrode holding side for holding the plurality of electrodes thereon and an action side unitarily, and that a location between the electrode holding side and the action side is pivotably supported by the shaft.

[0010] In a sixth aspect of the invention, the water tray is provided with a pressing portion protruding from the rear thereof to impinge on the action side of the electrode holder to press the action side.

[0011] In a seventh aspect of the invention, the pressing portion has a vertical pressing surface and a horizontal holding surface continuously formed from the pressing surface.

[0012] In accordance with the present invention, when the water tray is housed in the water tray housing section of the humidifier body, the interlock mechanism immerses the plurality of electrodes into water in the water tray, in response to the movement of the water tray. When the water tray is drawn out of the water tray housing section of the humidifier body, the interlock mechanism isolates the plurality of electrodes from water in the water tray, in response to the operation of drawing the water tray. Therefore, works on housing the water tray in the humidifier body and drawing it therefrom can be achieved easily. In addition, when the user cleans the water tray, the hands and fingers thereof are prevented from touching the plurality of electrodes to ensure safety.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

Fig. 1 is a front perspective view of a humidifier according to the present invention (Example 1);

Fig. 2 is a front perspective view of a body of the humidifier according to the present invention after a front panel is removed (Example 1);

Fig. 3 is a front perspective view of the front panel of the humidifier according to the present invention (Example 1);

Fig. 4 is a front perspective view of the body of the humidifier according to the present invention after the front panel is removed and a water tray is drawn

out (Example 1);

Fig. 5 is a standing cross-sectional side view of a portion corresponding to a fan in the humidifier according to the present invention (Example 1);

Fig. 6 is a standing cross-sectional side view of the humidifier according to the present invention after the water tray is drawn out (Example 1);

Fig. 7 is a standing cross-sectional side view of the humidifier according to the present invention after the water tray is housed in (Example 1) ;

Fig. 8 is a front perspective view of an electrode portion in the humidifier according to the present invention after the water tray is drawn out (Example 1); and

Fig. 9 is a configuration diagram of electrodes in the humidifier according to the present invention (Example 1).

DETAILED DESCRIPTION OF THE INVENTION

[0014] A humidifier of the present invention comprises a humidifier body. A water tray housing section is formed in the humidifier body. A water tray is detachably housed in the water tray housing section. A humidifying filter is located in the water tray and at least partly immersed into water. A fan is arranged to outwardly discharge air humidified through the humidifying filter. A plurality of electrodes are provided in the humidifier body and at least partly immersed into water in the water tray. An interlock mechanism is operative to immerse the plurality of electrodes into water in the water tray when the water tray is housed in the water tray housing section and isolate the plurality of electrodes from water in the water tray when the water tray is drawn out of the water tray housing section. Examples of the present invention will be described below.

[0015] Example 1 of the present invention is described next. Fig. 1 is a front perspective view of a humidifier according to the present invention. Fig. 2 is a front perspective view of a body of the humidifier according to the present invention after a front panel is removed. Fig. 3 is a front perspective view of the front panel of the humidifier according to the present invention. Fig. 4 is a front perspective view of the body of the humidifier according to the present invention after the front panel is removed and a water tray is drawn out. Fig. 5 is a standing cross-sectional side view of a portion corresponding to a fan in the humidifier according to the present invention. Fig. 6 is a standing cross-sectional side view of the humidifier according to the present invention after the water tray is drawn out. Fig. 7 is a standing cross-sectional side view of the humidifier according to the present invention after the water tray is housed in. Fig. 8 is a front perspective view of an electrode portion in the humidifier according to the present invention after the water tray is drawn out. Fig. 9 is a configuration diagram of electrodes in the humidifier according to the present invention.

[0016] In the figures, a humidifier 1 has a cabinet, which includes an open-front humidifier body 2 of plas-

tics, and a front panel 3 of plastics detachably attached to the body 2 at the front to close the opening in the front of the body 2. On the top of the body 2 is provided a foldable handle 1A. At both the left and right sides of the front panel 3 are vertically provided hooks 3A that are folded downward. In both the left and right sides of the front of the body 2 are vertically formed longitudinal engagement slits 2A that allow the hooks 3A to engage therewith from above. This configuration permits the front panel 3 to be detachably attached to the front of the body 2.

[0017] Inside the body 2, a water tray housing section 2S is formed in a lower portion, a ventilation space 2F surrounded in a partition 16 is formed above the housing section 2S, and a tank housing chamber 18 is formed adjacent to the ventilation space 2F on the right side. In the water tray housing section 2S at the lower portion of the body 2 is provided an open-top water tray 6. When the front panel 3 is removed, the water tray 6 can be slidably drawn back from and housed forth into the body 2 using a handle 6B formed at a lower front portion of the water tray 6.

[0018] In the lower portion of the body 2, a section wall 41 serves to section the water tray housing section 2S and the tank housing chamber 18 laterally. The water tray 6 has a recess 48 formed open at the rear to correspond to the section wall 41. When the water tray 6 is housed in the body 2, the section wall 41 fits into the recess 48 and serves to prevent the water tray 6 from moving laterally.

[0019] In the water tray 6, to divide the inside into a filter chamber 6F on the left side and a tank chamber 6T on the right side, a section wall 6C is formed. In the filter chamber 6F, a humidifying filter 7 is provided as humidifying means and a lower portion thereof is immersed into water in the water tray 6. This humidifying filter 7 is detachably supported in between front and rear ribs 6D formed at lower portions of the left and right sidewalls in the filter chamber 6F.

[0020] After the water tray 6 is slidably housed in the water tray housing section 2S through the opening of the front of the body 2, an open/close lid 17 provided on the right side of the top of the body 2 is rolled open. When a water supply tank 19 is inserted from above into the tank housing chamber 18, the water supply tank 19 is housed in the tank chamber 6T of the water tray 6.

[0021] Housing the water supply tank 19 in the tank housing chamber 18 sets the bottom of the water supply tank 19 into a recess 6A in the tank chamber 6T by gravity. In this state, a valve (not shown) provided through the bottom of the water supply tank 19 opens to supply water from the water supply tank 19 into the water tray 6. This structure retains a certain water level in the recess 6A of the water tray 6 as well as in the filter chamber 6F that is in communication with the recess 6A.

[0022] The water supply tank 19 is composed of plastic that makes water in the tank visible therethrough. When the water supply tank is housed in the tank chamber 18,

it locates proximate to the rear of the front panel 3. The water level in the water supply tank 19 can be observed visually through a longitudinally elongated window 3B formed through the front panel 3.

[0023] The ventilation space 2F houses a fan 8 or ventilating means that is rotated by a motor 11. In order to provide a sufficient static pressure of air at an air inlet on the humidifying filter 7, the fan 8 comprises a centrifugal fan that is rotated by the motor 11, typically a sirocco fan and a turbo fan. The humidifier 1 of this example comprises a laterally elongated sirocco fan 8A. Within the ventilation space 2F, the sirocco fan 8A is located in a fan chamber 15F formed by a fan casing 15 having an outlet 15A facing the water tray 6.

[0024] The sirocco fan 8A includes a number of wings 14 extending in parallel with a lateral shaft 13 around the periphery. In addition, a support disc 12 having a boss is provided at the lateral center. Outside the fan casing 15 is arranged the motor 11 that rotates the lateral shaft 13 attached in the boss of the support disc 12. In front view, the sirocco fan 8A sucks air through the left and right sides and sends the sucked air through between the wings 14 in the centrifugal direction. The air blast sent from the sirocco fan 8A flows through the outlet 15A, as the arrows, toward the water tray 6 located below.

[0025] The humidifier 1 has an air-sucking inlet 4 and a humidified air-blowing outlet 5 formed thereon. The humidifier 1 has a draft path 10 therein that connects the sucking inlet 4 and the blowing outlet 5. In the draft path 10, a passage extends from the sucking inlet 4 to the fan chamber 15F in the fan casing 15. A passage extends from the fan chamber 15F via the aperture 15A to the air inlet on the humidifying filter 7 in the water tray 6. A passage extends from the air outlet on the front of the humidifying filter 7 to the blowing outlet 5 (a passage between the rear of the front panel 3 and the partition 16 at the front of the fan casing 15). These passages form a series of the draft path 10.

[0026] In such the configuration, the ventilating humidifying filter 7 is located in the draft path 10 and the fan 8 is located above the filter. The sucking inlet 4 is provided with a filter 9 and formed over the rear and the left side of the body 2. The blowing outlet 5 is formed on the upper portion of the front panel 3. The blowing outlet 5 includes a blowing outlet cover 35 that is composed of a plurality of longitudinal frames 33 and a plurality of lateral frames 34. The reference numeral 20 denotes an electrical box formed in a closed space behind the water tray 6, which houses an electrical component 20A therein.

[0027] The humidifying filter 7 includes a fibrous filter 7B housed in a plastic frame 7A. The lower portion of the fibrous filter 7B is housed in the water tray 6 and immersed into water. The fibrous filter 7B includes longitudinal partitions 7B1 arranged at a certain pitch and wavy partitions 7B2 each arranged between the longitudinal partitions 7B1, 7B1. These partitions form a number of air paths 7C that are made open in the front and rear surfaces of the humidifying filter 7.

[0028] The longitudinal partitions 7B1 and the wavy partitions 7B2 are composed of a nonwoven fabric of chemical fibers to suck water from inside the water tray by a capillary action of the filter 7B. The air blast supplied from the fan 8 passes through the air paths 7C. While the air blast passes through the air paths 7C, the sucked water is vaporized (evaporated) and turned into an air with humidity or a humidified air. The air is sent to the front of the humidifying filter 7 and elevates in the draft path 10. It is then sent to outside the humidifier 1 through the blowing outlet 5 to humidify air in the room where the humidifier 1 is located.

[0029] In the present invention, a plurality of electrodes 40 are provided in the body 2 of the humidifier 1 such that at least part of the tips thereof are immersed into water in the water tray 6. The water tray 6 is detachably housed in the water tray housing section 2S formed at the lower portion of the body 2 of the humidifier 1 as described above. Therefore, the electrodes 40 enter in place such that they are immersed into water in the water tray 6 after the water tray 6 is housed in as shown in Fig. 7, and they are moved out of water in the water tray 6 after the water tray 6 is drawn out as shown in Fig. 6. In this way, the electrodes 40 are supported in the body 2 of the humidifier 1 rotatably in accordance with the operations of housing and drawing the water tray 6.

[0030] Specifically, in a recess 43 formed in a rear wall 2S1 of the water tray housing section 2S is rotatably provided an electrode holder 42, on which a driving force is exerted from a spring 45 to rotate the electrodes 40 always upward. The midsection of the electrode holder 42 is supported on the rear wall 2S1, or the sidewall of the recess 43, rotatably about a shaft 44. The electrode holder is formed unitarily with an electrode holding side 42A facing forward and an action side 42B facing downward and is driven by the spring 45 to rotate the electrodes 40 always upward. The electrode holder 42, the spring 45 and the shaft 44 form an interlock mechanism R that operates the electrodes 40 in response to the operations of housing and drawing the water tray 6.

[0031] In this example, a midsection between the electrode holding side 42A and the action side 42B is supported around the shaft 44. The electrodes 40 are attached facing from the front surface of the electrode holding side 42A toward the front. The action side 42B faces forward and obliquely downward. A coil spring 45 is provided around the shaft 44. The spring 45 exerts a spring force on driving the electrode holder 42 to rotate the electrodes 40 always upward. When no external force is exerted, or after the water tray 6 is drawn out, as in Fig. 6, the electrode holding side 42A rotates to the upper location where it stays almost horizontal, and the electrodes 40 locate stationary, facing forward.

[0032] When the water tray 6 is housed in the water tray housing section 2S, a pressing portion 46 impinges on the tip of the action side 42B of the electrode holder 42 and presses the action side 42B. The pressing portion 46 is provided protruding from the rear of the water tray

6, or the rear wall, toward backward almost horizontally.

[0033] The pressing portion 46 is configured as follows. The water tray 6 can be slidably housed deeper in the water tray housing section 2S through the entrance. In this case, from the initial stage to the middle stage of housing, the electrodes 40 may descend to a certain position where they are immersed into water in the water tray 6 (shown in Fig. 7). To achieve this, the pressing portion 46 has an almost vertical longitudinal pressing surface 47A and an almost horizontal lateral holding surface 47B. The pressing surface 47A press-rotates the electrode holder 42 against the force of the spring 45. The holding surface 47B holds the electrodes 40 at a certain descent position, from the middle stage of housing when the electrodes 40 descend to a certain position in the water tray 6, to the final housing position of the water tray 6.

[0034] In accordance with the above configuration, after the water tray 6 is drawn out, the electrode holding side 42A rotates to the upper position by the spring force of the coil spring 45 where it stays almost horizontal, as shown in Fig. 6, and the electrodes 40 locate stationary, facing forward. As the water tray 6 is pressed and housed in the water tray housing section 2S, the tip of the action side 42B of the electrode holder 42 impinges on the pressing surface 47A of the pressing portion 46.

[0035] This state is the initial stage state of housing the water tray 6. As the water tray 6 is further pressed into the water tray housing section 2S from this state, the tip 42B1 of the action side 42B is pressed by the pressing surface 47A against the spring force of the coil spring 45. In addition, the tip 42B1 of the action side 42B slides upward on the pressing surface 47A. As a result, the electrode holder 42 rotates to move the electrodes 40 downward. The rotation of the electrode holder 42 is counterclockwise in Figs. 6 and 7.

[0036] When the water tray 6 is further pressed into the water tray housing section 2S, the tip 42B1 of the action side 42B passes by the upper end of the pressing surface 47A and impinges on the holding surface 47B or the upper surface of the pressing portion 46. At the same time, the electrodes 40 descend to a certain position in the water tray 6 (the electrodes 40 face almost vertically downward as shown in Fig. 7). This state is the middle stage of housing the water tray 6. When the water tray 6 is further pressed into the water tray housing section 2S from this state, the tip 42B1 of the action side 42B slides on the holding surface 47B almost horizontally and reaches the final housing position of the water tray 6. Thus, from the middle stage of housing when the electrodes 40 descend to a certain position in the water tray 6 to the final housing position of the water tray 6, the electrodes 40 are still held at the certain descent position.

[0037] An appropriate configuration may be applied to hold the water tray 6 at the final housing position. In a method for that purpose, the water tray 6 impinges on the rear of the front panel 3 to prevent the water tray 6 from moving forward. In another method, one of a recess

and a protrusion that fit with each other at the final housing position of the water tray 6 is formed on the water tray 6, and the other is formed on the bottom of the water tray housing section 2S. In yet another method, an engagement portion on the water tray 6 engages with an engagement portion on the water tray housing section 2S at the final housing position of the water tray 6.

[0038] When the water tray 6 is drawn out of the final housing position of the water tray 6, the reverse of the housing process is executed. By the spring force of the coil spring 45, the tip 42B1 of the action side 42B slides on the holding surface 47B and comes off the rear end of the holding surface 47B. The tip 42B1 of the action side 42B then impinges on the pressing surface 47A, and finally the electrode holder 42 separates from the pressing portion 46 of the water tray 6.

[0039] The electrodes 40 in the example include sterilizing electrodes for sterilizing water in the water tray 6 and water level detecting electrodes for detecting the level of water in the water tray 6. As shown in Figs. 8 and 9, electrodes 40A and 40B having the same length configure the sterilizing electrodes, and the electrode 40B and a shorter electrode 40C configure the water level detecting electrodes. The electrode 40B is employed as a common electrode in the sterilizing electrodes and the water level detecting electrodes.

[0040] One of the sterilizing electrodes 40A, 40B is employed as a plus electrode and the other as a minus electrode. These electrodes are energized to generate a hypochlorous acid in water in the water tray 6 through electrolysis with chlorine ions contained in tap water such as water from a city water supply. The generated hypochlorous acid can be employed to sterilize water in the water tray 6.

[0041] During water level detection of water in the water tray 6, when one electrode 40B stays in water, the water level may lower below the other shorter electrode 40C. In this case, a later-described control circuit 23 determines and indicates on a light-emitting diode (LED) display that the water tray 6 is lacking in water. The indication on the light-emitting diode (LED) is executed by later-described light-emitting diodes (referred to as LEDs) 31A-31E.

[0042] In operation of the humidifier 1, power is supplied to the electric component 20A. In the front portion on the top of the body 2 is provided an operation section 21 having a plurality of switches 22A-22E arrayed laterally in line. These switches 22A-22E are employed to select ON-OFF of the power supply to the humidifier 1, an operation mode, ON-OFF of a minus ion generator 25, and a timer setting. On the basis of operations to these switches, the control circuit 23 consisting of electronic components can operate to achieve an intended control. On the basis of detection at a humidity sensor (not shown), the humidity in the room is indicated on a humidity display 24 for LCD indication.

[0043] The humidifier 1 is equipped with a display 30 so that the operation mode selected by the switch 22B

can be confirmed visually from external. This display 30 includes a plurality of light-emitting diodes and a light guide member having a light-emitting illumination surface that can be confirmed visually from external when light from the light-emitting diodes is guided therethrough.

[0044] In this example, the light-emitting diodes include five light-emitting diodes (referred to as LEDs) 31A-31E having light-emitting surfaces facing the front and arrayed laterally in line on the board of the control circuit 23. These five light-emitting diodes (referred to as LEDs) 31A-31E are located in five corresponding pass-holes 32A-32E formed through the front surface of the top of the body 2. The light-emitting diodes (referred to as LEDs) 31A-31E are configured to emit light toward the front through the corresponding pass-holes 32A-32E.

[0045] The longitudinal frames 33 of the blowing outlet cover 35 for the front panel 3 are configured to serve as the light guide member having the light-emitting illumination surface. The light-emitting diodes (referred to as LEDs) 31A-31E are employed to shine the longitudinal frames 33 and vary the shining region depending on the operation state of the fan 8. Thus, it is possible to visually confirm the operation state of the fan 8 from outside the humidifier 1 and additionally improve the decorating effect.

[0046] Among the longitudinal frames 33, the longitudinal frames 33A-33E corresponding to the pass-holes 32A-32E are intended to shine the light-emitting illumination surfaces thereof (the upper surfaces of the longitudinal frames 33A-33E) on receipt of light from the light-emitting diodes (referred to as LEDs) 31A-31E. For that purpose, the longitudinal frames 33A-33E are composed of a light transmissive resin such as a transparent acrylic resin.

[0047] As described above, the shortage of water in the water tray 6 can be detected with the use of the water level detecting electrodes 40B, 40C and the control circuit 23. Then, the control circuit 23 controls the light-emitting diodes (referred to as LEDs) 31A-31E such that they blink to notice the need for supplement of water to the water supply tank 19. Therefore, the user of the humidifier 1 can visually confirm it easily.

[0048] As described above, the electrodes 40 enter the water tray 6 in place after the water tray 6 is housed in and leave from the water tray 6 after the water tray 6 is drawn out. With this regard, the electrodes 40 are supported in the electrode holder 42 provided in the body 2 of the humidifier 1 so that they can rotate in response to the operations of housing and drawing the water tray 6. Thus, the water tray 6 is configured to have no electrode attached thereto. Thus in accordance with housing and drawing the water tray 6, the electrodes 40 enter the water tray 6 and leave therefrom. Accordingly, the work on housing the water tray 6 in the body 2 of the humidifier 1 and the work on drawing the water tray 6 out of the body 2 can be executed easily. When the water tray 6 is drawn out and cleaned, the worker is capable, without touching the electrodes 40, of cleaning the water tray 6

and housing/drawing the water tray 6 with safety. The electrodes 40 are not attached to the water tray 6 and the wires connected to the electrodes 40 are not extended to the water tray 6 accordingly. As a result, the work on assembling the humidifier 1 can be made easier.

[0049] The pressing portion 46 for pressing the electrode holder 42 against the spring force is provided on the rear wall of the water tray 6. Therefore, from the initial stage to the middle stage of housing the water tray 6, the electrode holder 42 impinges on the longitudinal pressing surface 47A at the rear of the pressing portion 46 and rotates. As a result, the electrodes 40 enter in the water tray 6 to a certain position. From the middle stage to the final housing position of the water tray 6, the electrode holder 42 impinges on the horizontal holding surface 47B formed on the upper surface of the pressing portion 46 to hold the electrodes 40 in the water tray 6 at the certain position. Therefore, even if the water tray 6 is housed in the humidifier body on a specified position 2 with front and rear margins, the electrodes 40 can remain on the normal descent position. Thus, the humidifier can be configured to achieve a stable control operation. Accordingly, the humidifier has a simplified configuration and makes production errors sufficiently absorbable.

[0050] The present invention is not limited to the above embodiments of the humidifier but applicable to various other embodiments of the humidifier, without departing from the technical scope of the present invention.

Claims

1. A humidifier, **characterized by** a humidifier body; a water tray housing section formed in the humidifier body; a water tray detachably housed in the water tray housing section; a humidifying filter located in the water tray and at least partly immersed into water; a fan arranged to outward discharge air humidified through the humidifying filter; a plurality of electrodes provided in the humidifier body and at least partly immersed into water in the water tray; and an interlocking mechanism operative to immerse the plurality of electrodes into water in the water tray when the water tray is housed in the water tray housing section and move the plurality of electrodes out of water in the water tray when the water tray is drawn out of the water tray housing section.
2. The humidifier according to claim 1, **characterized in that** the plurality of electrodes include sterilizing electrodes for sterilizing water in the water tray.
3. The humidifier according to claim 1, **characterized in that** the plurality of electrodes include sterilizing electrodes for sterilizing water in the water tray and water level detecting electrodes for detecting a water level of water in the water tray.

4. The humidifier according to claim 1, **characterized in that** the interlocking mechanism includes an electrode holder having one end for holding the plurality of electrodes and the other end impinging on part of the water tray; a shaft rotatably supporting the mid-section of the electrode holder; and a spring for driving the electrode holder to always rotate the electrodes upward. 5
5. The humidifier according to claim 4, **characterized in that** the electrode holder is formed to have an electrode holding side for holding the plurality of electrodes thereon and an action side unitarily, and that a location between the electrode holding side and the action side is pivotably supported by the shaft. 10 15
6. The humidifier according to claim 5, **characterized in that** the water tray is provided with a pressing portion protruding from the rear thereof to impinge on the action side of the electrode holder to press the action side. 20
7. The humidifier according to claim 6, **characterized in that** the pressing portion has a vertical pressing surface and a horizontal holding surface continuously formed from the pressing surface. 25

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Fig. 1

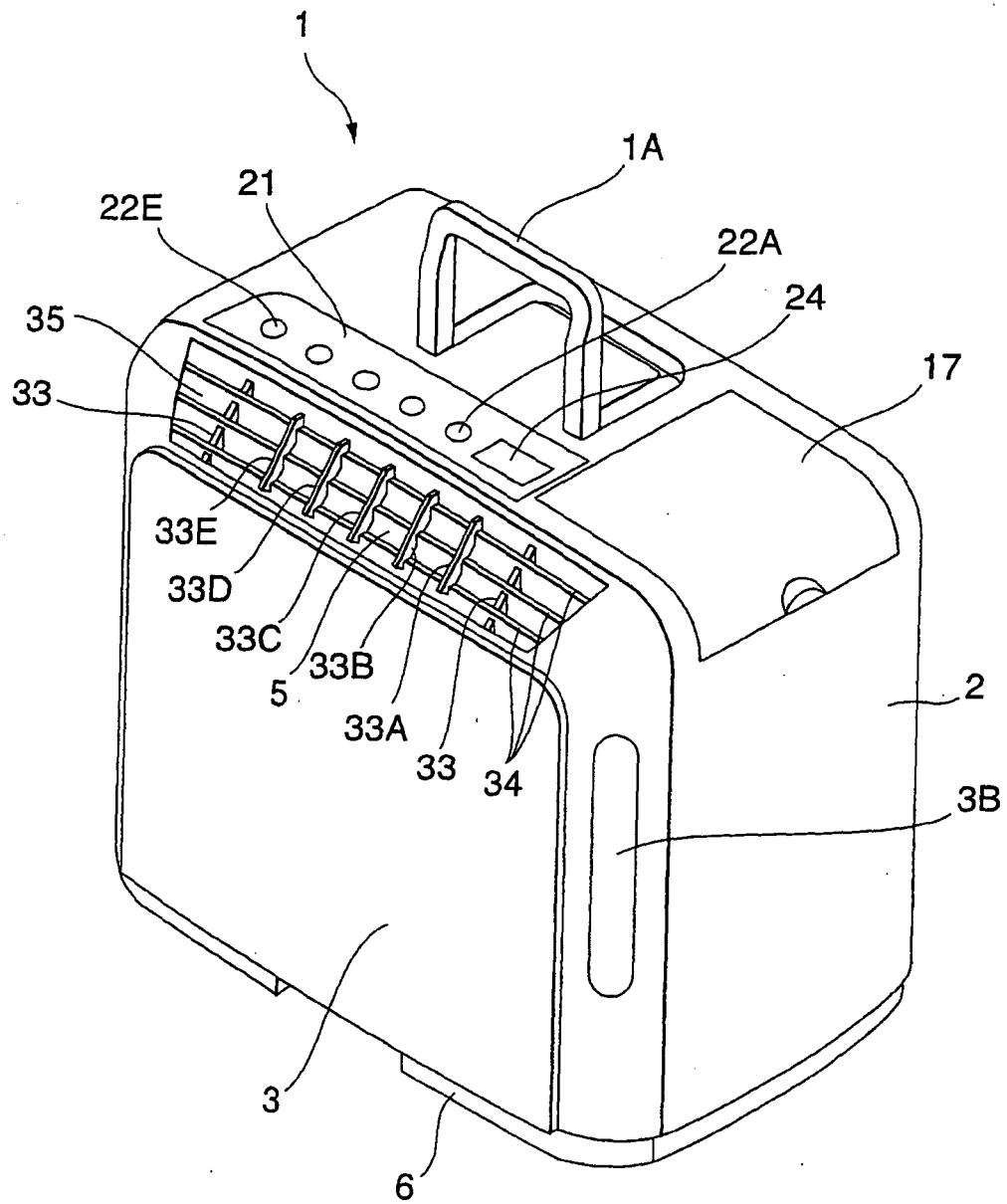


Fig. 2

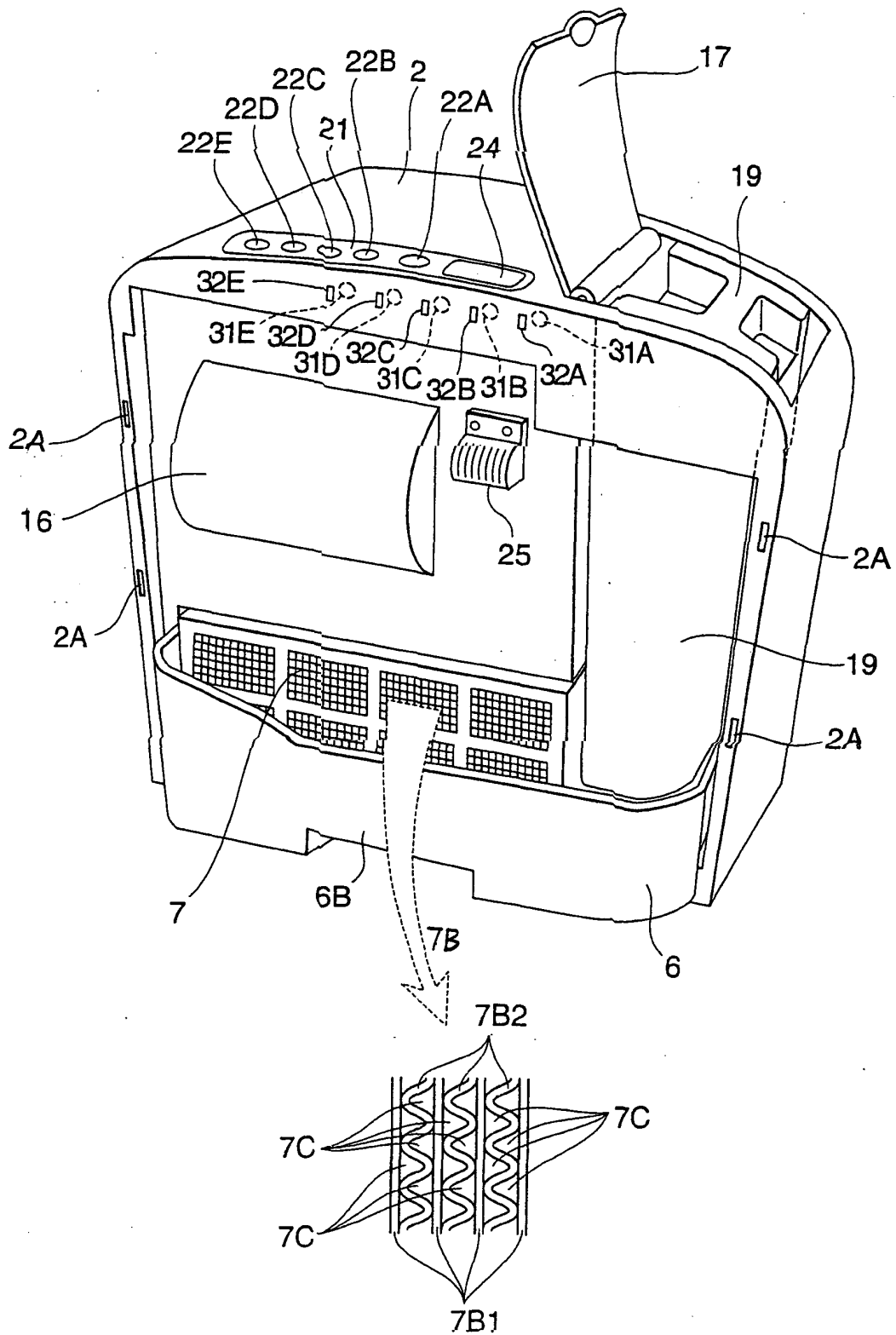


Fig. 3

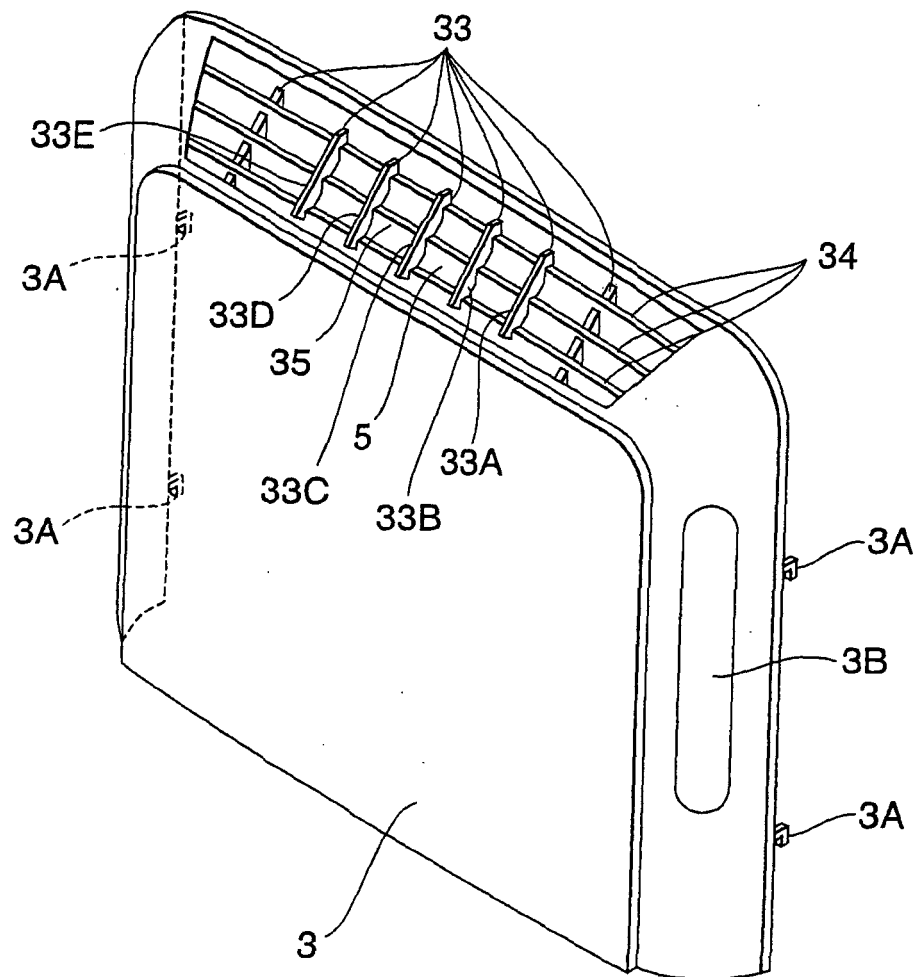


Fig. 4

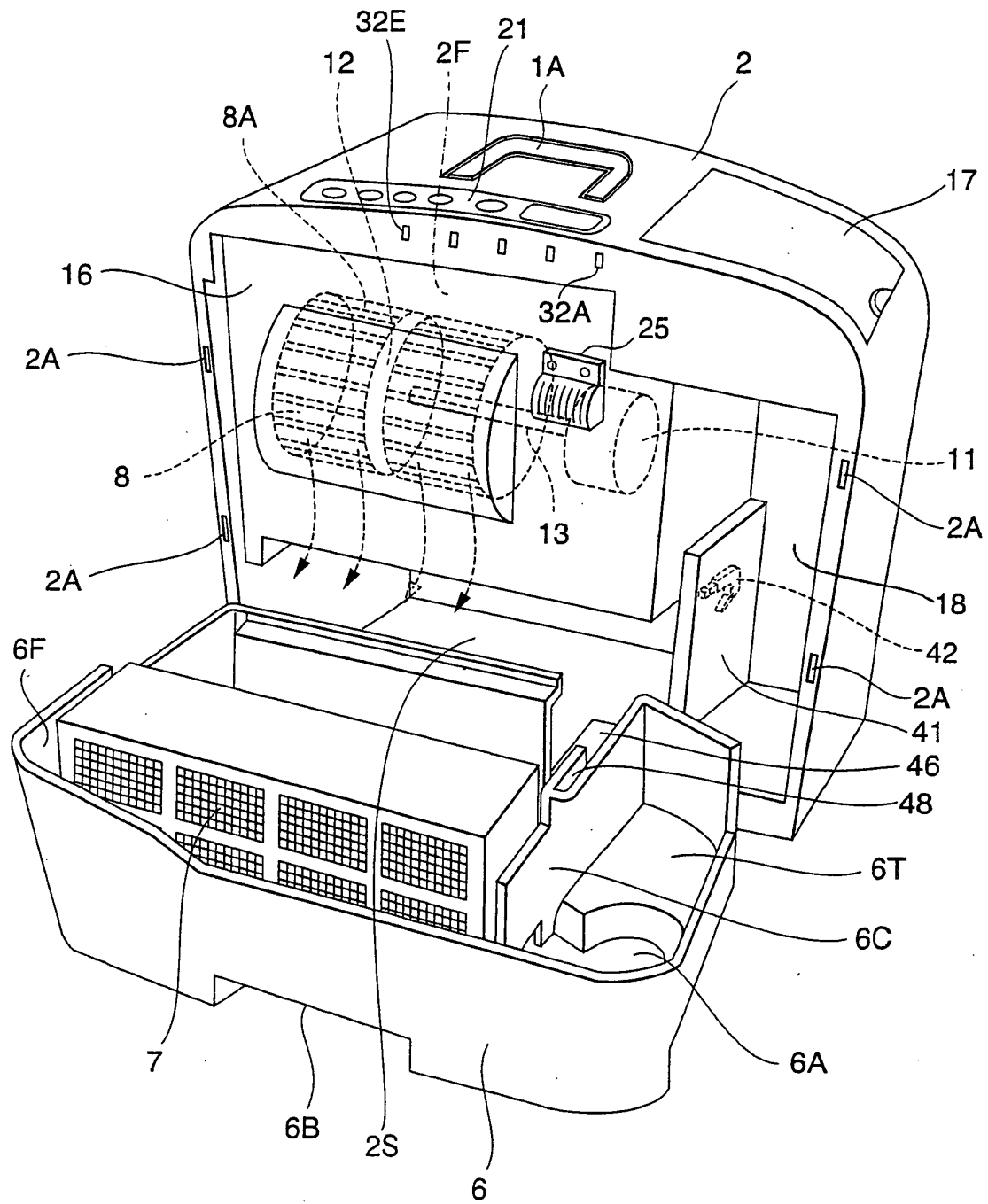


Fig. 5

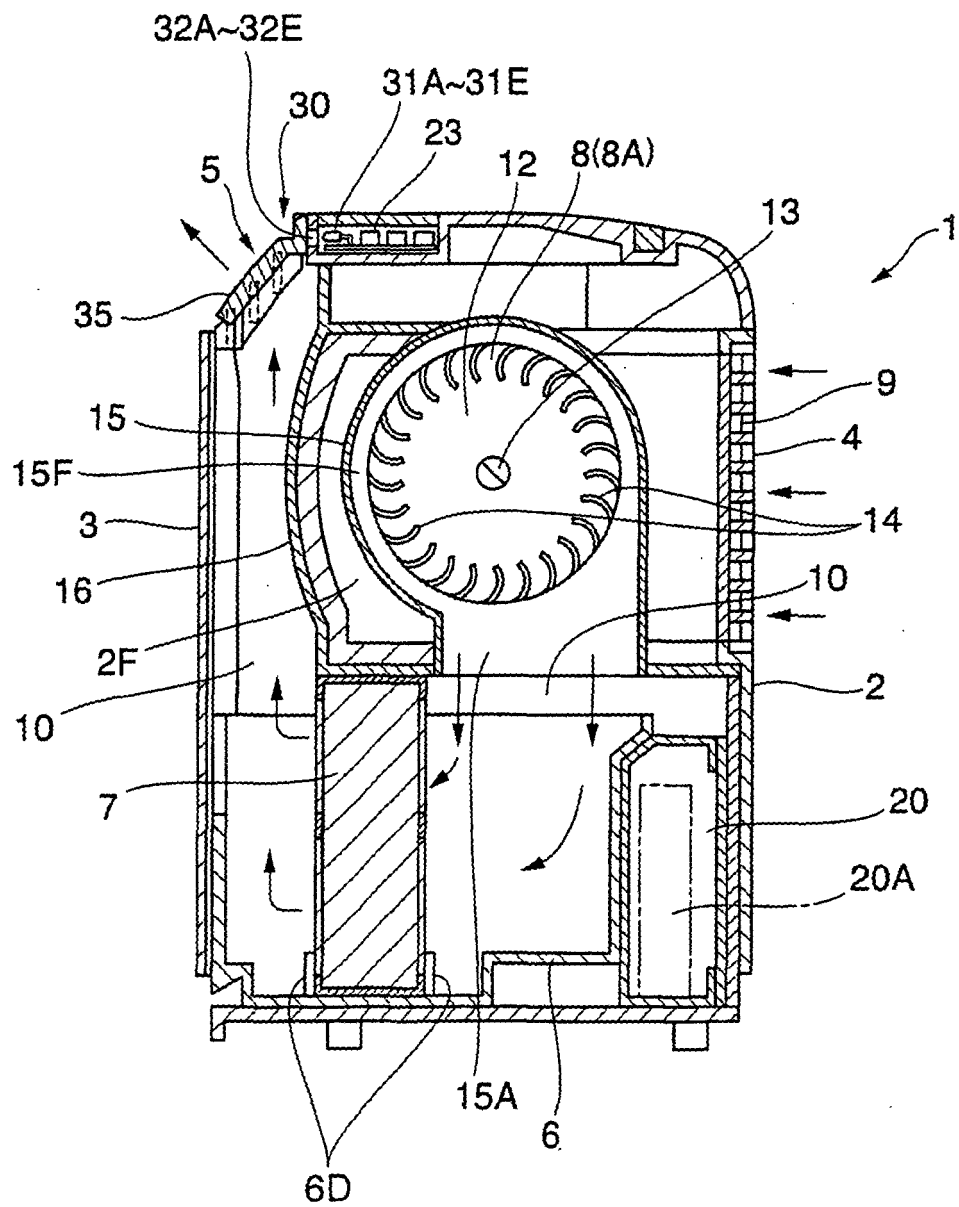


Fig. 6

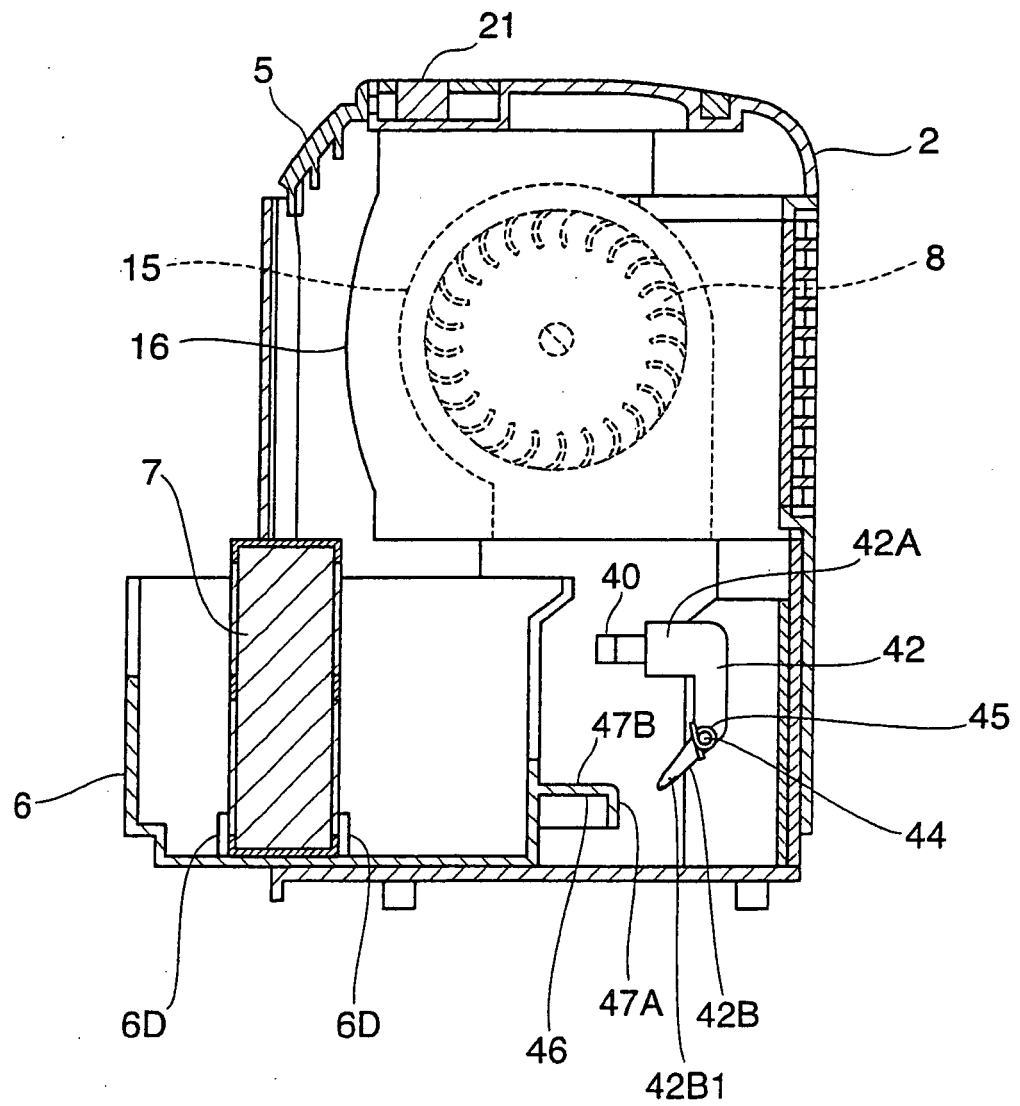


Fig. 7

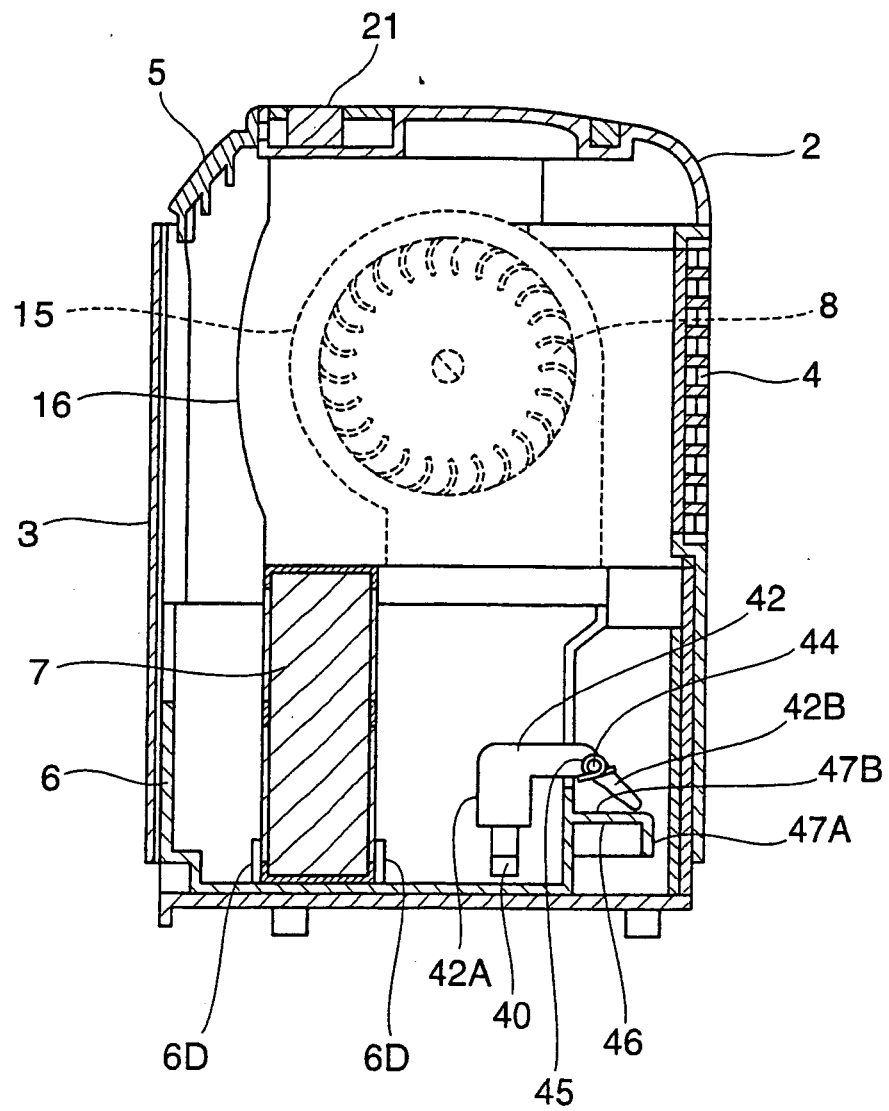


Fig. 8

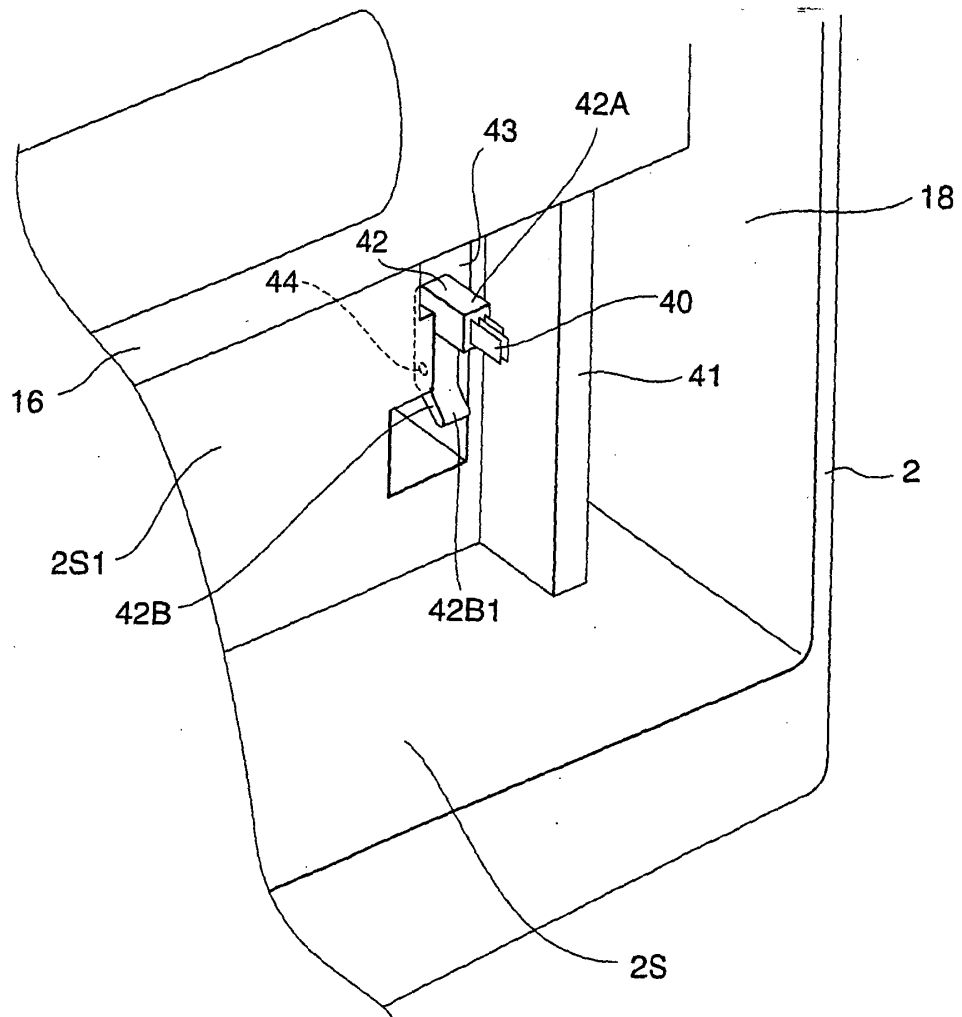
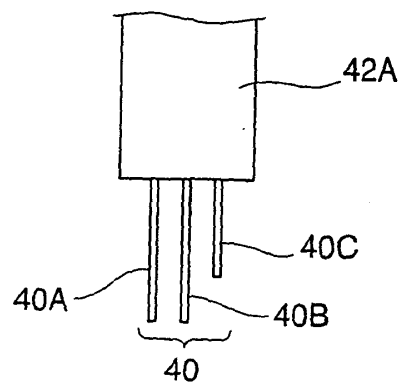


Fig. 9





European Patent
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EUROPEAN SEARCH REPORT

Application Number
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