(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 327 347 A1

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
01.06.2011 Bulletin 2011/22

(21) Application number: **09800500.2**

(22) Date of filing: **29.04.2009**

(51) Int Cl.:
A47L 11/34 *(2006.01)* ***A47L 9/02*** *(2006.01)*

(86) International application number:
PCT/KR2009/002275

(87) International publication number:
WO 2010/011019 (28.01.2010 Gazette 2010/04)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

(30) Priority: **21.07.2008 KR 20080070454**
26.12.2008 KR 20080134079
26.12.2008 KR 20080134067
26.12.2008 KR 20080134078

(71) Applicant: **LG Electronics Inc.**
Seoul 150-721 (KR)

(72) Inventors:
- **CHO, Seong-Koo**
Changwon City
Gyoungsangnam-do 641-711 (KR)
- **HWANG, Geun-Bae**
Changwon City
Gyoungsangnam-do 641-711 (KR)
- **LEE, Dong-Jae**
Changwon City
Gyoungsangnam-do 641-711 (KR)
- **SHIN, Jin-Hyouk**
Changwon City
Gyoungsangnam-do 641-711 (KR)

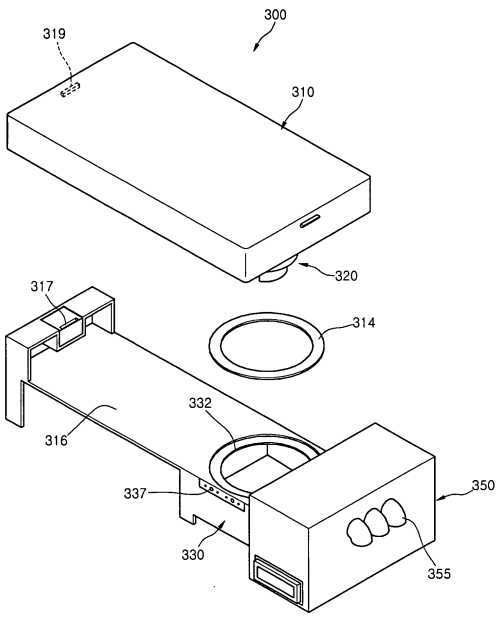
(74) Representative: **TER MEER - STEINMEISTER & PARTNER GbR**
Patentanwälte
Mauerkircherstrasse 45
81679 München (DE)

(54) CLEANER NOZZLE

(57) An exemplary embodiment relates to a nozzle of a cleaner, and more particularly, to a nozzle of a cleaner capable of reducing a steam generation duration by improving a structure of a steam generating device provided in the nozzle of the cleaner.

The nozzle of the cleaner according to the exemplary embodiment can reduce the steam generation time and prevent water in the nozzle from being leaked to the outside.

Fig. 14



EP 2 327 347 A1

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] An exemplary embodiment relates to a nozzle of a cleaner, and more particularly, to a nozzle of a cleaner capable of reducing a steam generation duration by improving a structure of a steam generating device provided in the nozzle of the cleaner.

2. Description of the Related Art

[0002] As cleaners as an apparatus for reducing human labors by performing cleaning, various kinds of cleaners such as a vacuum cleaner using a suction force, a water cleaner suctioning both water and air by injecting water, and a cleaner removing foreign substances on the bottom surface by injecting steam are disclosed.

[0003] In addition, a vacuum steam cleaner capable of implementing both suction of the foreign substances by the vacuum cleaner and steam cleaning by the water cleaner has also appeared.

[0004] Meanwhile, a nozzle of the steam cleaner includes a steam generating device generating steam therein and the steam generating device includes a rag attached to a lower part thereof and uses supplied steam to remove the foreign substances on the bottom surface. In addition, the steam generating device has a heater therein and allows water to be converted into steam by high-temperature heat.

[0005] The steam generating device has adopted an induction heating type having a heater at one portion of a water tank and generating steam by heating water in the water tank and a tube heating type generating steam by sending a very small amount of water to the heater.

[0006] However, since the known induction heating type steam generating device heats a large amount of water, a steam generation duration is lengthened and a weight of a steam nozzle device is increased. In addition, since it is not easy to separate the water tank from the steam generating device, a possibility that a water storage tank will be contaminated increases.

[0007] Meanwhile, since the known tube heating type steam generating device has a heater of which the size and the capacity are small, the known tube heating type steam generating device injects water which is not converted into steam. As a result, steam generation efficiency is deteriorated and stability of a product is not ensured.

[0008] In addition, the tube heating type steam generating device should have a pump that sends water to the heater so as to cost a lot.

SUMMARY OF THE INVENTION

[0009] The present invention has been made in an effort to provide a nozzle of a cleaner capable of reducing a steam generation duration by improving a structure of a steam generating device.

[0010] Further, the present invention has been made in an effort to provide a nozzle of a cleaner that allows water of a water tank to easily flow into a heating unit through a water storage tank by setting the internal pressure of a water storage tank at atmospheric pressure.

[0011] In addition, the present invention has been made in an effort to provide a nozzle of a cleaner that prevents water from being excessively supplied to a heating unit from a nozzle unit or water from being leaked to the outside.

[0012] Besides, the present invention has been made in an effort to provide a nozzle of a cleaner that allows a water tank to be cleaned as necessary by providing the water tank to be demounted from a steam generating device.

[0013] An exemplary embodiment of the present invention provides a nozzle of a cleaner comprising a nozzle body forming the exterior thereof; a water tank provided in the nozzle body and supplying water; a heating unit heating water supplied from the water tank; and a water storage tank supplying water received from the water tank to the heating unit,wherein the water storage tank includes, a communicatio part being in communication with external air; and a barrier provided at one portion of the communication part and allowing air to pass and disabling water to be leaked.

[0014] According to exemplary embodiments of the present invention, since a small amount of water is supplied to a heating unit with a heater from a water storage tank, a steam generation duration can be reduced.

[0015] Further, a barrier is provided in the water storage tank to enable external air to be in communication with the water storage tank while to disable water to pass through the barrier, and as a result, the internal pressure of the water storage tank is maintained at atmospheric pressure and water in the water storage tank is prevented from being leaked to the outside.

[0016] In addition, the internal pressure of the water storage tank is set to atmospheric pressure to allow water to easily flow into the heating unit from the water tank through a water storage tank.

[0017] A channel guide is provided in the water storage tank to allow water to be supplied to the heating unit from the water storage tank little by little, thereby preventing water from overflowing while a large amount of water is supplied to the heating unit at a time.

[0018] Since a water tank can be easily mounted on and demounted from a nozzle body, it is easy to supply water by using the water tank or to clean the water tank, thereby improving user convenience.

[0019] Besides, since a steam generating device can be implemented in a simple structure, the total weight of the nozzle with the steam generating device can decrease.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020]

FIG. 1 is a perspective view of a cleaner nozzle according to a first exemplary embodiment of the present invention;

FIG. 2 is a perspective view of an inner part of a nozzle showing an opened state of an upper cover of the cleaner nozzle according to the first exemplary embodiment of the present invention;

FIG. 3 is a perspective view of a configuration of a steam generating device according to the first exemplary embodiment of the present invention;

FIG. 4 is a diagram showing a configuration of a cap according to the first exemplary embodiment of the present invention;

FIG. 5 is a front view showing a configuration of a steam generating device according to the first exemplary embodiment of the present invention;

FIG. 6 is a plan view showing a configuration of a cap according to the first exemplary embodiment of the present invention;

FIG. 7 is a cross-sectional view showing operations of a water tank and a water storage tank according to the first exemplary embodiment of the present invention;

FIG. 8 is a cross-sectional view taken along line II-II' of FIG. 5;

FIG. 9 is an exploded perspective view of a nozzle showing a state in which a water tank is separated according to the first exemplary embodiment of the present invention;

FIG. 10 is a perspective view showing a configuration of a removable assembly according to the first exemplary embodiment of the present invention;

FIG. 11 is a bottom perspective view showing a configuration of a water tank according to the first exemplary embodiment of the present invention;

FIG. 12 is a cross-sectional view taken along line I-I' of FIG. 1;

FIG. 13 is a cross-sectional view showing an operation of a removable assembly according to the first exemplary embodiment of the present invention;

FIG. 14 is an exploded perspective view showing a configuration of a steam generating device according to a second exemplary embodiment of the present invention;

FIG. 15 is a diagram showing a configuration of a water storage tank according to the second exemplary embodiment of the present invention; and

FIG. 16 is a cross-sectional view taken along line III-III' of FIG. 14.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] Hereinafter, detailed embodiments of the present invention will be described with reference to the accompanying drawings. However, the spirit of the present invention is not limited to the proposed embodiments but another embodiment may be easily proposed by those skilled in the art who understand the spirit of the present invention within the same spirit of the present invention.

[0022] FIG. 1 is a perspective view of a cleaner nozzle according to a first exemplary embodiment of the present invention and FIG. 2 is a perspective view of an inner part of a nozzle showing an opened state of an upper cover of the cleaner nozzle according to the first exemplary embodiment of the present invention.

[0023] Referring to FIGS. 1 and 2, a nozzle 1 of a cleaner according to the first exemplary embodiment of the present invention includes a nozzle body 10 forming the exterior of the nozzle, an upper cover 20 shielding the upper part of the nozzle body 10, side covers 22 shielding both parts of the nozzle body 10, and a connector 30 provided at one portion of the nozzle body 10 and allowing air suctioned by the nozzle to move to a main body (not shown) of the cleaner.

[0024] Although not shown in the figure, the nozzle 1 of the cleaner is connected with the main body of the cleaner through an extension pipe and a connection hose. The connector 30 allows the nozzle 1 to be connected with the extension pipe.

[0025] The nozzle body 10 includes an air suctioning unit 12 suctioning air including dust from a cleaned surface and a suctioning channel 13 allowing air suctioned through the air suctioning unit 12 to move to the connector 30.

[0026] The suctioning channel 13 may extend toward the rear from the air suctioning unit 12.

[0027] Further, the nozzle body 10 includes a steam generating device 100 converting supplied water to steam.

[0028] The steam generating device 100 includes a water tank 110, storing supplied water, a water storage tank 120 provided in the lower part of the water tank 110, into which water of a predetermined amount flows from the water tank 110, and a heating unit 150 provided at one portion of the water storage tank 120 and heating water that flows in from the water storage tank 120.

[0029] In the state in which the steam generating device 100 is mounted on the nozzle 1, the water tank 110 may form a part of the top surface of the nozzle 1.

[0030] A seating portion 21 on which the water tank 110 is seated is formed in the upper cover 20. The seating portion 21 may be recessed in a shape corresponding to the water tank 110.

[0031] The water storage tank 120 and the heating unit 150 may be provided at both sides of the suctioning path 13.

[0032] Further, the nozzle 1 includes a removable assembly 200 allowing the water tank 110 to be removably coupled to the nozzle body 10. The removable assembly 200 includes a pressing unit 210 pressed to separate the

water tank 110.

[0033] A user operates the pressing unit 210 to allow the water tank 110 to be separated. In addition, when the water tank 110 is seated on the nozzle body 10 and pressed downwardly, the water tank 110 may be suspended on the nozzle body 10 by a predetermined suspending structure. A detailed description thereof will be described with reference to the accompanying drawings.

[0034] Meanwhile, the water tank 110 is provided in the upper part of the water storage tank 120. In addition, a cap 140 is provided between the water tank 110 and the water storage tank 120 to control water to flow into the water storage tank 120 from the water tank 110. The cap 140 may be coupled to the lower part of the water tank 110.

[0035] Hereinafter, a structure of the steam generating device 100 will be described with reference to the accompanying drawings.

[0036] FIG. 3 is a perspective view of a configuration of a steam generating device according to the first exemplary embodiment of the present invention and FIG. 4 is a diagram showing a configuration of a cap according to the first exemplary embodiment of the present invention.

[0037] Referring to FIGS. 3 and 4, the steam generating device 100 according to the first exemplary embodiment of the present invention includes a water tank 110 storing water, a water storage tank 120 provided in the lower part of the water tank 110 and selectively receiving water of a predetermined amount from the water tank 110, and a heating unit 150 provided at one portion of the water storage tank 120 and generating steam by heating water that flows in from the water storage tank 120.

[0038] Specifically, the water tank 110 includes a storage space where water is stored and the storage space may be disposed in a horizontal direction. The user separates the water tank 110 and fills the water tank 110 with water and thereafter, may couple the water tank 110 to the nozzle body 10. Therefore, water in the water tank 110 may flow into the heating unit 150 through the water storage tank 120.

[0039] The water tank 110 includes a tank opening portion 115 (see FIG. 8) through which water is discharged. While the water tank 110 is coupled to the nozzle body 10, the tank opening portion 115 may be disposed to face downwardly.

[0040] Further, the water storage tank 120 may include a storage space where water of the water tank 110 is stored. The water storage space of the water storage tank 120 may be smaller than the storage space of the water tank 110. That is, the water of the water tank 110 flows into the water storage tank 120 little by little and thereafter, is provided to the heating unit 150.

[0041] Consequently, a small amount of water is supplied from the storage tank 120 to the heating unit 150, which heats the supplied water, thereby shortening a steam generation duration.

[0042] Meanwhile, the cap 140 allowing water to selectively flow into the water storage tank 120 from the water tank 110 is disposed at the lower portion of the tank opening portion. The cap 140 may be coupled to the water tank 110 by a helical coupling method. However, when the cap 140 is easily coupled to the water tank 110, it will be enough and the coupling method is not limited to one coupling method. The water tank 110 may be seated on the upper part of the water storage tank 120 in the state in which the cap 140 is coupled to the water tank 110.

[0043] Specifically, the cap 140 includes a cap body 141 forming the exterior thereof, a valve member 142 movably provided in the upper part of the cap body and controlling water to be supplied to the water storage tank 120 from the water tank 110, a guide portion 143 guiding the movement of the valve member 142, and a close adhesion portion 145 connected with the guide portion 143.

[0044] The inner part of the cap body 141 is vacant to allow water to move therein. In addition, the upper end and the lower end of the cap body 141 are opened to allow water to flow into the water storage tank 120 from the water tank 110. That is, a movement channel for moving water may be formed in the cap body 141.

[0045] In the state in which the water tank 110 and the cap 140 are coupled to each other, the upper end of the cap body 141 may be fitted in one portion of a protrusion 117 (see FIG. 8) of the water tank 110.

[0046] The valve member 142 may be coupled to the guide portion 143 by a forcible fitting method. However, the coupling method is not limited thereto and when the valve member 142 and as long as the guide portion 143 move integratedly, diverse coupling methods may be proposed.

[0047] Further, an elastic member 146 is provided in the lower portion of the guide portion 143 to allow the guide portion 143 and the valve member 142 to elastically move. The elastic member 146 may be provided outside of the guide portion 143. In addition, one portion of the elastic member 146 is supported on one portion of the cap body 141 and the other portion of the elastic member 146 is supported on the close adhesion portion 145.

[0048] The close adhesion portion 145 may interfere with an interference portion 125 (see FIG. 5) provided in the water storage tank 120. When the cap 140 is coupled to the upper portion of the water storage tank 120, the interference portion 125 presses the bottom surface of the close adhesion portion 145. During this process, the close adhesion portion 145 moves upwardly and the elastic member 146 is compressed. In addition, as the close adhesion portion 145 moves, the guide portion 143 and the valve member 142 also move upwardly.

[0049] As the valve member 142 moves upwardly, the valve member 142 may be spaced apart from the top surface of the cap body 141. In addition, the water of the water tank 110 may move to the inner part of the cap body 141 through a spaced gap.

[0050] FIG. 5 is a front view showing a configuration

of a steam generating device according to the first exemplary embodiment of the present invention and FIG. 6 is a plan view showing a configuration of a cap according to the first exemplary embodiment of the present invention. The steam generating device shown in FIGS. 5 and 6 does not have the water tank 110 and the cap 140.

[0051] Referring to FIGS. 5 and 6, the water storage tank 120 according to the first exemplary embodiment of the present invention includes a water storage tank body 121 having a water storage portion and a cap coupling portion 122 provided in the upper portion of the water storage tank body 121 and allowing the cap 140 to be coupled. The cap 140 may be received in the cap coupling portion 122.

[0052] Further, the water storage tank 120 includes the interference portion 125 which interferes with the close adhesion portion 145 while the cap 140 is coupled thereto. The interference portion 125 protrudes upwardly of the cap coupling portion 122 and may be supported on the water storage tank 120 by a supporting portion 126.

[0053] Meanwhile, the inner part of the water storage tank 120 is configured to be in communication with external air, and as a result, the inner part of the water storage tank 120 may be at atmospheric pressure.

[0054] To enable this, a communication part 123 allowing the inner part of the water storage tank 120 to be in communication with external air is formed in the water storage tank body 121. The communication part 123 protrudes upwardly from the top surface of the water storage tank body 121. The communication part 123 protrudes upwardly to allow air to be easily flows in and out, while water stored in the water storage tank 121 may be restricted from being leaked to the outside.

[0055] A barrier 170 allowing only air to selectively pass is disposed in the upper portion of the communication part 123. The barrier 170 may be made of a fiber material.

[0056] In addition, the barrier 170 has a size corresponding to the communication part 123 to shield the communication part 123. The barrier 170 may prevent the water in the water storage tank 120 from being leaked to the outside. Accordingly, even though the water storage tank 120 wobbles or overturns during using the nozzle 1, the water in the water storage tank 120 may be prevented from overflowing to the outside.

[0057] On the contrary, external air may flow into the water storage tank 120 through the barrier 170, and as a result, the inner part of the water storage tank 120 may be at atmospheric pressure.

[0058] Meanwhile, the cap coupling portion 122 includes a receiving element 127 receiving the cap body 141 and a sealing member 128 disposed outside of the receiving element 127 and preventing water from being leaked from the cap 140.

[0059] A water storage tank opening portion 129 allowing water moving through the cap 140 to flow into the water storage tank 120 is disposed in the receiving unit 127. When the cap body 141 is received in the receiving portion 127, water moving through the inner part of the cap body 141 may flow into the water storage tank 120 through the water storage tank opening portion 129.

[0060] Meanwhile, the heating unit 150 converting water received from the water storage tank 120 into steam is disposed at one portion of the water storage tank 120. The heating unit 150 includes a heater 151 generating heat and a steam discharging portion 155 discharging steam generated by the heater 151. A sheath heater, a PTC heater, a ceramic heater, and the like may be applied to the heater 151.

[0061] Although not shown in the figure, a heat transfer preventing member preventing the heat of the heater 151 from being directly transferred onto the surface of the heating unit 150 may be disposed in at least one portion of the heater 151. The heat transfer preventing member may absorb the water of the heating unit 150 as much as a predetermined amount. Meanwhile, the heat transfer preventing member may be disposed to surround the circumference of the heater 151.

[0062] In addition, the heater 151 is disposed in the lower part of the heating unit 150 and the steam discharging portion 155 may be disposed in the upper part of the heating unit 150. Steam is lighter than water. Therefore, even though the steam discharging portion 155 is disposed in the upper part of the heating unit 150, steam may be easily discharged through the steam discharging portion 155.

[0063] A connection channel 180 allowing the water of the water storage tank 120 to move to the heating unit 150 is disposed between the water storage tank 120 and the heating unit 150.

[0064] FIG. 7 is a cross-sectional view showing operations of a water tank and a water storage tank according to the first exemplary embodiment of the present invention.

[0065] Referring to FIG. 7, water stored in the water tank 110 according to the first exemplary embodiment of the present invention may flow into the water storage tank 120 through the tank opening portion 115. During this process, the valve member 142 of the cap 140 is opened.

[0066] In addition, the water in the water storage tank 120 flows into the heating unit 150 through the connection channel 180.

[0067] The water in the water tank 110 may flow into the heating unit 150 through the water storage tank 120 according to the Pascal's principle. The Pascal's principle means a theory that pressure applied to fluids contained in a tightly sealed container is transferred to all parts of the fluids and a wall of the container containing the fluids without reduction in its magnitude.

[0068] As described above, air pressure in the water storage tank 120 is maintained at atmospheric pressure. When the water tank 110 is seated on the water storage tank 120 in the state in which the cap 140 is coupled to the water tank 110, the close adhesion portion 145 and

the interference portion 125 interfere with ach other. Therefore, the elastic member 146 is compressed and the valve member 142 moves upwardly to open the tank opening portion 115.

[0069] When the tank cap 140 is opened, the water in the water tank 110 drops to the water storage tank 120 by gravity, i.e., water pressure. During this process, air in the water storage tank 120 flows into the water tank 110 through the cap 140.

[0070] Thereafter, when a water level in the water storage tank 120 is raised to shield the water storage tank opening portion 129, the air in the water storage tank 120 cannot flow into the water tank 110 through the tank cap 140. In this state, vacuum pressure is formed in the water tank 110 and the water in the water tank 110 cannot flow into the water storage tank 120 any longer.

[0071] Meanwhile, when the cap 140 is separated from the water storage tank 120, the elastic member 146 returns to its original location and the valve member 142 moves downwardly to shield the upper portion of the cap body 141.

[0072] FIG. 8 is a cross-sectional view taken along line II-II' of FIG. 5.

[0073] Referring to FIG. 8, the water storage tank 120 according to the first exemplary embodiment of the present invention includes a water storage tank 121 forming the exterior thereof and a channel guide 130 disposed in the water storage tank body 121 and guiding the movement of water in the water storage tank.

[0074] Specifically, the water storage tank body 121 includes a water storage portion 124 storing water and a water storage tank discharging portion 121a allowing water to be discharged to the outside of the water storage tank body 121 in the state in which a part of the water storage tank 121 is opened. The connection channel 180 may be connected to the water storage tank discharging portion 121a.

[0075] The channel guide 130 includes a first guide 131 extending in one direction from one portion of the water storage tank body 121 and a second guide 132 extending in the other direction from the first guide 131. That is, the first guide 131 and the second guide 132 may extend in different directions.

[0076] In the channel guide 130, the first guide 131 and the second guide 132 may be coupled as separate members, but the first guide 131 and the second guide 132 may be integratedly formed as one member.

[0077] When the first guide 131 and the second guide 132 are integratedly formed, the second guide 132 may be bent from the end of the first guide 131. As one exemplary embodiment, the channel guide 130 may be bent in a "ㄱ" type as shown in the figure.

[0078] Operations of the water storage tank 120 and the channel guide 130 according to the exemplary embodiment will be described.

[0079] When the water level of the water storage tank 120 is higher than that of the heating unit 150, the water stored in the water storage portion 124 is guided by the channel guide 130 to be discharged through the water storage tank discharging portion 121a.

[0080] Specifically, the water stored in the water storage portion 124 moves in direction a (a first direction) on one portion of the first guide 131. Herein, a channel formed in the direction a is referred to as a "first channel". In addition, the water flowing on the first channel may flow in a direction opposite to a flowing direction of the water flowing through the connection channel 180.

[0081] The water moving on the first channel is bent and thereafter, moves in direction b (a second direction) on the other portion of the first guide 131. Herein, a channel formed in the direction b is referred to as a "second channel". In addition, the water flowing on the second channel may flow in a direction perpendicular to the flowing direction of the water flowing through the connection channel 180.

[0082] The water moving on the second channel is bent and thereafter, moves in direction c (a third direction) on one portion of the second guide 132. Herein, a channel formed in the direction c is referred to as a "third channel". The water moving on the third channel is discharged to the outside of the water storage tank 120 through the water storage tank discharging portion 121a and may flow into the heating unit 150 through the connection channel 180.

[0083] As described above, the water stored in the water storage portion 124 is bent in the plurality of directions to flow before being discharged to the outside of the water storage tank 120. In addition, the flowing bent by the channel guide 130 may be different from the flowing direction of the water moving through the connection channel 180.

[0084] That is, the water stored in the water storage portion 124 is not immediately discharged to the heating unit 150 but discharged by being bent in diverse directions by the channel guide 130, as a result, only a small amount of water may flow into the heating unit 150. In addition, even in the case where the nozzle 1 is inclined to the heating unit 150, the water in the water storage portion 124 is prevented from flowing into the heating unit 150 at a time.

[0085] Consequently, since only a small amount of water in the water stored in the water storage portion 124 flows into the heating unit 150, the steam generation duration in the heating unit 150 may be shortened.

[0086] Further, even though water is thrashed while the nozzle 1 wobbles or overturns, the channel guide 130 serves as a barrier to prevent water from being leaked to the outside of the nozzle.

[0087] Meanwhile, although the channel guide 130 includes the first guide 131 and the second guide 132 in the figure, the channel guide 130 may have more guides. In addition, the guides 131 and 132 are arranged perpendicular to each other and may be arranged while forming diverse angels with each other.

[0088] FIG. 9 is an exploded perspective view of a nozzle showing a state in which a water tank is separated

according to the first exemplary embodiment of the present invention, FIG. 10 is a perspective view showing a configuration of a removable assembly according to the first exemplary embodiment of the present invention, FIG. 11 is a bottom perspective view showing a configuration of a water tank according to the first exemplary embodiment of the present invention, and FIG. 12 is a cross-sectional view taken along line I-I' of FIG. 1.

[0089] Referring to FIGS. 9 to 12, a removable assembly 200 according to a second exemplary embodiment of the present invention includes a pressing unit 210 operated by a user, a removable guide provided to move forward and backward by operating the pressing unit 210, and a movement plate 230 selectively suspended on the removable guide 220.

[0090] Specifically, the pressing unit 210 is provided to move upwardly and downwardly with respect to a seating portion on which the water tank 110 is seated.

[0091] Meanwhile, a protrusion 21a protruding from one surface of the seating portion 21 is formed at the seating portion 21. While the pressing unit 210 moves, at least a part of the pressing unit 210 may be received in the protrusion 21a.

[0092] The pressing unit 210 includes a pressing unit body 211 forming a first slope 211a and a suspending hook 225 extending downwardly from the pressing unit body 211. The suspending hook 215 is received in the protrusion 21a. In addition, the protrusion 21a includes a guide groove 27a guiding the movement of the suspending hook 215.

[0093] When the pressing unit 210 is pressed downwardly, the suspending hook 215 moves downwardly on the guide groove 27 and when the pressing unit 210 moves upwardly, the suspending hook 215 may be suspended on the upper end of the guide groove 27.

[0094] The removable guide 220 is disposed at one portion of the pressing unit 210. At least one part of the removable guide 220 may be disposed to be received in the pressing unit 210.

[0095] Specifically, the removable guide 220 includes a guide body 221 forming a second slope 221a, a suspending jaw 222 extending forward from the guide body 221, and a suspending projection 224 extending downwardly from the guide body 221.

[0096] The first slope 211a and the second slope 221a are formed in directions opposite to each other. In addition, the first slope 211a is provided to contact the upper portion of the second slope 221a.

[0097] Further, the suspending jaw 222 may be suspended on the water tank 110 while the water tank 110 is seated on the seating portion 21. In addition, the water tank 110 includes a tank groove 112 positioned to correspond to the suspending jaw 222. The suspending jaw 222 is inserted into the tank groove 112 to couple the water tank 110 to the upper cover 20.

[0098] Meanwhile, the water tank 110 includes a recess portion 113 recessed in a predetermined direction. The recess portion 113 may be disposed at the lower portion of the tank groove 112. When the pressing unit 210 is pressed, the recess portion 113 may be supported on the upper part of the removable guide 220 while the water tank 110 is separated from the upper cover 20.

[0099] In addition, a removable projection 115 is disposed on a front surface of the water tank 110 to allow the water tank 110 to be coupled with the seating portion 21 in the state in which the water tank 110 is seated on the seating portion 21. A removable groove 25 is disposed at a location of the seating portion 21 corresponding to the removable projection 115. When the removable projection 115 is coupled to the removable groove 25, the water tank 110 may be easily coupled to the seating portion 21.

[0100] The suspending projection 224 extends downwardly from the guide body 221 and thereafter, is bent forward. That is, the suspending projection 224 has a "ㄱ" shape on the whole.

[0101] The suspending projection 224 may be suspended on the movement plate 230. Meanwhile, the movement plate 230 includes a suspending groove 231 positioned to correspond to the suspending projection 224. The suspending projection 224 includes a third slope 224a suspended on the suspending groove 231.

[0102] The third slope 224a is formed at a front end of the suspending projection 224 and may interfere with one surface of the movement plate 230 while the water tank 110 is coupled to the seating portion 21.

[0103] Further, a first elastic member 232 is disposed in the lower part of the movement plate 230 to elastically move the movement plate 230. A general spring may be applied to the first elastic member 232. The first elastic member 232 is compressed while the suspending projection 224 is coupled to the suspending groove 231.

[0104] In contrast, when the suspending projection 224 is desuspended from the suspending groove 231, the first elastic member 232 is tensed and during this process, the movement plate 230 may move up.

[0105] Since the movement plate 230 elastically supports the lower part of the water tank 110, when the movement plate 230 moves up, the water tank 110 also moves up to be separated from the seating portion 21.

[0106] A second elastic member 227 allowing the removable guide 220 to be elastically supported on the seating portion 21 is disposed in rear portion of the guide body 221. The general spring may be applied to the second elastic member 227.

[0107] In addition, the removable guide 220 includes a spring coupling portion 226 coupled to the second elastic member 227. The spring coupling portion 226 extends backward from the rear surface of the guide body 221. When the removable guide 220 moves backward, the second elastic member 227 is compressed and when the removable guide 220 moves forward the second elastic member 227 is tensed.

[0108] Hereinafter, an operation of the removable assembly according to the exemplary embodiment will be described.

[0109] FIG. 13 is a cross-sectional view showing an operation of a removable assembly according to the first exemplary embodiment of the present invention. Referring to FIG. 13, in the case of operating the pressing unit 210 in order to separate the water tank 110, a series of subsequent operations will be described.

[0110] When the user presses the pressing unit 210, the first slope 211a presses the second slope 221a downwardly. In this case, since the removable guide 220 is elastically supported on the seating portion 21, the removable guide 220 is restricted to move downwardly.

[0111] In addition, the removable guide 220 moves backward while compressing the second elastic member 227 (direction e). Therefore, the suspending jaw 222 is spaced apart from the tank groove 112 and the removable guide 220 and the water tank 110 are decoupled from each other.

[0112] Meanwhile, when the removable guide 220 moves backward, the suspending projection 224 also moves backward. Therefore, the suspending projection 224 is spaced apart from the suspending groove 231 and the removable guide 220 and the movement plate 230 are decoupled from each other.

[0113] In this case, the movement plate 230 may move upwardly by the restoration force of the first elastic member 232 (direction f). Consequently, the water tank 110 moves upwardly by the movement plate 230 and the user may easily grip and separate the water tank 110 which moves up.

[0114] Thereafter, when the pressing unit 210 is depressed, the removable guide 220 moves forward by the restoration force of the second elastic member 227. That is, the suspending jaw 222 and the suspending projection 224 may move forward.

[0115] Although not shown in the figure, when the full tank 110 is completely separated, the suspending jaw 222 is positioned at the recess portion 113 and the end of the suspending projection 224 is positioned in the lower part of the movement plate 230.

[0116] Meanwhile, when the water tank 110 is coupled, the bottom of the water tank 110 presses the movement plate 230 downwardly. Therefore, the movement plate 230 may interfere with the third slope 224a and during this process, the suspending projection 224 moves backward.

[0117] That is, the removable guide 220 moves backward. In addition, when the water tank 110 reaches the coupling location, the removable guide 220 moves forward by the restoration force of the second elastic member 227. Consequently, the suspending jaw 222 may be inserted into and coupled to the tank groove 112 and the suspending projection 224 may be inserted into and coupled to the suspending groove 231.

[0118] According the above configuration, since the water tank may be separated by simply operating the pressing unit of a button type, the user may easily fill the water tank with water and easily clean the water tank.

[0119] Further, since the water tank may be easily coupled to the nozzle by pressing the water tank downwardly at the time of coupling the water tank, user convenience is increased and reliability of a product is improved.

[0120] FIG. 14 is an exploded perspective view showing a configuration of a steam generating device according to a second exemplary embodiment of the present invention, FIG. 15 is a diagram showing a configuration of a water storage tank according to the second exemplary embodiment of the present invention, and FIG. 16 is a cross-sectional view taken along line III-III' of FIG. 14.

[0121] Referring to FIGS. 14 and 16, the steam generating device 300 according to the second exemplary embodiment of the present invention includes a water tank 310 storing water, a water storage tank 330 provided in the lower part of the water tank 310 and selectively receiving water of a predetermined amount from the water tank 310, and a heating unit 350 provided at one portion of the water storage tank 330 and generating steam by heating water that flows in from the water storage tank 330.

[0122] Specifically, a tank opening portion 312 opened to allow the water stored in the water tank 310 to flow into the water storage tank 330 is disposed in one portion of the water tank 310. In addition, the bottom of the water tank 310 is downwardly inclined to the tank opening portion 312. Accordingly, the water stored in the water tank 310 may easily move to the tank opening portion 312.

[0123] A tank cap 320 selectively shielding the tank opening portion 112 is provided at the tank opening portion 312. The tank cap 320 extends to the inside of the water storage tank 330.

[0124] Further, the steam generating device 300 includes a seating plate 316 on which the water tank 310 is seated. The seating plate 316 may be disposed on the same surface as the top surface of the water storage tank 330.

[0125] In addition, a removable portion 317 for fixing the water tank 310 which is seated is formed at the seating plate 317. The removable portion 317 may have a groove shape recessed downwardly. To correspond to this, a removable projection 319 provided to be coupled to the removable portion 317 is formed in the water tank 310. The removable projection 319 may be bent to have a "ㄱ" shape.

[0126] Meanwhile, the water storage tank 330 includes a water storage tank opening portion 332 into which the water supplied from the water tank 310 flows. The water storage tank opening portion 332 may be larger than the tank opening portion 312. Since the water storage tank opening portion 332 is larger than the tank opening portion 312, the tank cap 320 may easily extend to the inside of the water storage tank 330 from the lower portion of the tank opening portion 312.

[0127] An external air inflow hole 337 allowing external air to flow in is formed in the water storage tank 330. The air inflow hole 337 may be called "communication part". The plurality of external air inflow holes 337 may be formed on the outer surface of the water storage tank

330. When air flows in through the external air inflow hole 337, the inner part of the water storage tank 330 may be at atmospheric pressure.

[0128] A sealing member 314 for preventing water from being leaked from the water storage tank 330 is disposed between the water tank 310 and the water storage tank 330. The sealing member 314 is disposed on the outer circumferential surface of the water storage tank opening portion 332.

[0129] Further, the heating unit 350 heating water received from the water storage tank 330 into steam is disposed at one portion of the water storage tank 330.

[0130] A heater (not shown) that heats water to generate steam is disposed in the heating unit 350. In addition, the heating unit 350 includes a steam discharging portion 355 discharging the generated steam. The steam discharging portion 355 has a tubular shape. A part of the steam discharging portion 355 extends inwardly and the rest part may be protruded outside of the heating unit 350.

[0131] Hereinafter, a configuration of the water storage tank 330 including the external air inflow hole 337 will be described.

[0132] The external air inflow hole 337 is disposed substantially in the upper part of one surface of the water storage tank 330. The plurality of external air inflow holes 337 may be arranged parallel to the top surface of the water storage tank 330.

[0133] Further, a shielding unit 360 selectively shielding the external air inflow hole 337 is disposed the inner part of the one surface of the water storage tank 330. The shielding unit may be called "a barrier".

The shielding unit 360 has a size enough to shield the plurality of external air inflow holes 137 at the same time and may have a thin-film shape.

[0134] The shielding unit 360 may shield the external air inflow hole 337 when water pressure in the water storage tank 330 is activated. On the contrary, in the case where the water pressure acts on the shielding unit 360 due to a low water level in the water storage tank 330, the shielding unit 360 is spaced apart from the water storage tank 330 and external air may flow in through the external air inflow hole 337.

[0135] In addition, bent portions 361 bent backward from the front surface of the shielding unit 360 are disposed at both ends of the shielding unit 360. Elastic members 364 allowing the shielding member 360 to be elastically supported on the water storage tank 330 are connected to the bent portions 361. The elastic members 364 may be disposed at both sides of the shielding unit 360.

[0136] One portion of the elastic member 364 is fixed to the bent portion 361 and the other portion of the elastic member 364 is fixed to the inner surface of the water storage tank 330.

[0137] Further, a coupling hole 339 allowing the shielding unit 360 to be coupled to the water storage tank 330 penetrates the water storage tank 330. The plurality of coupling holes 339 are formed among the plurality of external air inflow holes 337 and may be larger than the external air inflow holes 337. In addition, the external air inflow holes 337 and the coupling holes 339 may be arranged in line.

[0138] The coupling holes 339 and the external air inflow holes 337 may be disposed higher than the center of the water storage tank 330 in the upper part of the water storage tank 330. Accordingly, in the case where a water level in the water storage tank 330 is not higher than the center of the water storage tank 330, a possibility that water will be discharged through the external air inflow holes 337 or the coupling holes decreases.

[0139] A coupling projection 362 inserted into the coupling hole 339 is disposed in the shielding unit 360. While the shielding unit 360 shields the external air inflow hole 337, the coupling projection 362 may be inserted into the coupling hole 339.

[0140] Meanwhile, the lower end of the shielding unit 360 may be disposed lower than the external air inflow hole 337 and the coupling hole 339 by a distance of t1. In this case, in the state in which the shielding unit 360 is spaced apart from the water storage tank 330, the water in the water storage tank 330 may act on the shielding unit 360 before the water is discharged through the external air inflow holes 337. Accordingly, the water in the water storage tank 330 may be prevented from being discharged through the external air inflow holes 337.

[0141] Further, in the state in which the shielding unit 360 is spaced apart from the inner surface of the water storage tank 330, a front part of 360a of the shielding unit 360 may be spaced apart from the water storage tank 330 by a distance of 11. Herein, the shielding unit 360 may be spaced apart from the water storage tank 330 by the restoration force of the elastic member 364. 11 may be approximately 1 mm.

[0142] Hereinafter, an operation of the shielding unit 360 will be described.

[0143] When water is not supplied to the water storage tank 330 or the water storage tank 330 is filled with a little water, the shielding unit 360 is spaced apart from the inner surface of the water storage tank 330. In addition, since external air flows into the water storage tank 330 through the external air inflow holes 337, the internal pressure of the water storage tank 330 may be at atmospheric pressure.

[0144] Meanwhile, when water flows in from the water tank 310, the water level of the water storage tank 330 is gradually raised. In this case, when water contacts the shielding unit 360, i.e., when water pressure acts on the shielding unit 360, the shielding unit 360 gets over the restoration force of the elastic member 364 to move toward the water storage tank 330.

[0145] In addition, when the shielding unit 360 is in close contact with the inner surface of the water storage tank 330, the coupling projection 362 is inserted into the coupling hole 339. In addition, the front part 360a of the shielding unit 360 shields the external air inflow holes

337. In this case, external air cannot flow into the water storage tank 330 through the external air inflow holes 337 any longer and the inner part of the water storage tank 330 is blocked from the outside.

[0146] In this state, when the water in the water storage tank 330 moves to the heating unit 350, the water level in the water storage tank 330 is dropped. In addition, when the water level in the water storage tank 330 is lower than the lower end of the shielding unit 360, the water pressure does not act on the shielding unit any longer. Therefore, the shielding unit 360 is spaced apart from the inner surface of the water storage tank 330 by the restoration force of the elastic member 364 and the external air may flow in.

[0147] By operating the external air inflow holes 337 and the shielding member 360, the internal pressure of the water storage tank 330 may easily be at atmospheric pressure.

[0148] Further, when the water level in the water storage tank 330 is raised in the state in which the external air inflow holes 337 are opened, the external air inflow holes 337 are shielded, thereby preventing the water in the water storage tank 337 from being leaked to the outside through the external air inflow holes 337.

[0149] Besides, even when the water storage tank wobbles while operating the nozzle of the cleaner, water acts on the shielding unit, which may shield the external air inflow holes, thereby preventing water from being leaked.

[0150] According to exemplary embodiments, a barrier is provided in the water storage tank to enable external air to be in communication with the water storage tank while to disable water to pass through the barrier, and as a result, the internal pressure of the water storage tank is maintained at atmospheric pressure and water in the water storage tank is prevented from being leaked to the outside. Therefore, industrial applicability is remarkable.

[0151] While this invention has been described in connection with what is presently considered to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims. Accordingly, the exemplary embodiments will be modified without departing from the sprit and scope of the present invention.

Claims

1. A nozzle of a cleaner, comprising:

a nozzle body forming the exterior thereof;
a water tank provided in the nozzle body and supplying water;
a heating unit heating water supplied from the water tank; and
a water storage tank supplying water received from the water tank to the heating unit,
wherein the water storage tank includes,
a communicatio part being in communication with external air; and
a barrier provided at one portion of the communication part and allowing air to pass and disabling water to be leaked.

2. The nozzle of claim 1, wherein the water storage tank includes a water storage tank body with a water storage portion, and
the communication part protrudes upwardly of the water storage tank body.

3. The nozzle of claim 2, wherein the water storage tank body includes:

a water storage tank discharging portion discharging water in one direction; and
a channel guide provided at the water storage portion and guiding water to move in the other direction in the water storage tank.

4. The nozzle of claim 3, wherein the channel guide includes:

a first guide extending in one direction from the water storage tank body; and
a second guide extending in the other direction from the first guide.

5. The nozzle of claim 1, wherein the barrier shields an opened top surface of the communication part.

6. The nozzle of claim 1, further comprising a removable assembly allowing the water tank to be removably coupled to a seating portion of the nozzle body.

7. The nozzle of claim 6, wherein the removable assembly includes:

an operable pressing unit;
a removable guide provided to move by operating the pressing unit; and
an elastic member elastically supporting the removable guide on the nozzle body.

8. The nozzle of claim 7, further comprising a movement plate selectively suspended on the removable guide and provided to move.

9. The nozzle of claim 8, wherein the removable guide is movable forward and backward and the movement plate is movable upwardly and downwardly.

Fig. 1

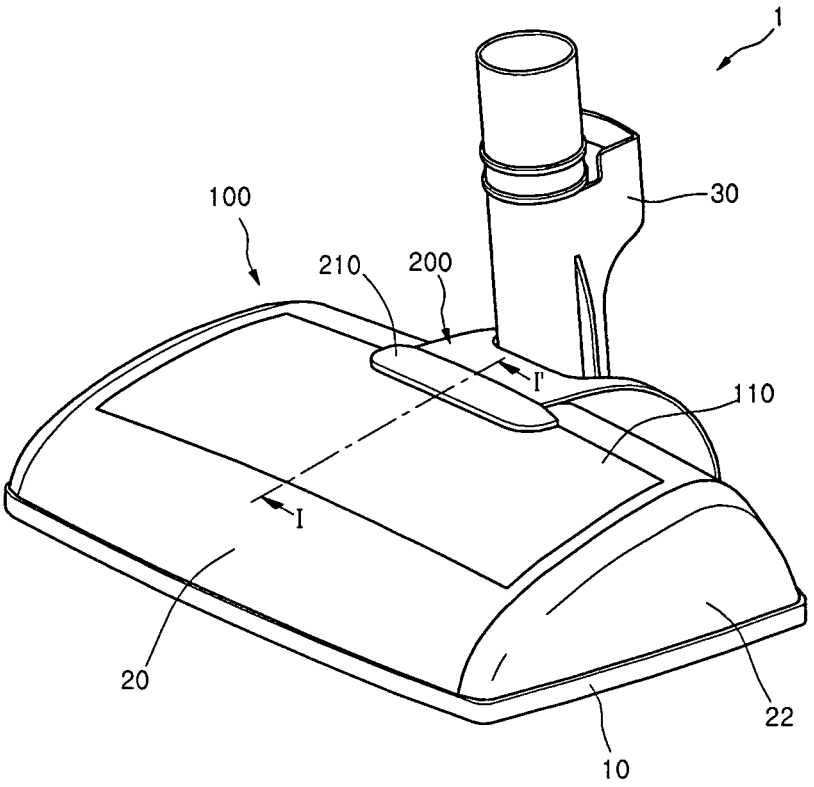


Fig. 2

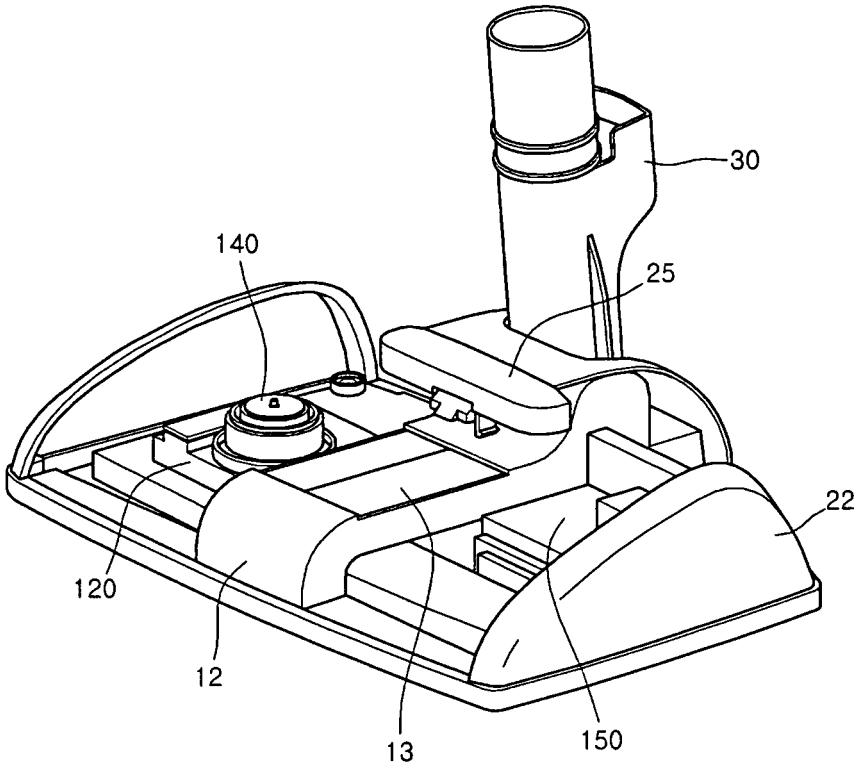


Fig. 3

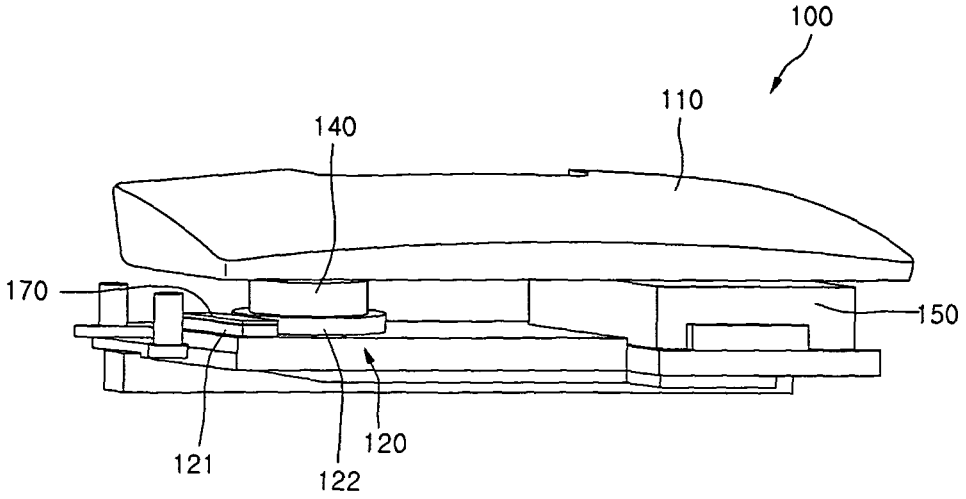


Fig. 4

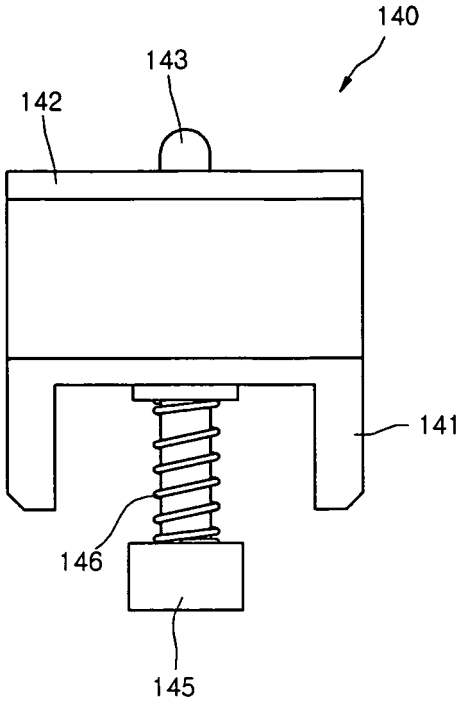


Fig. 5

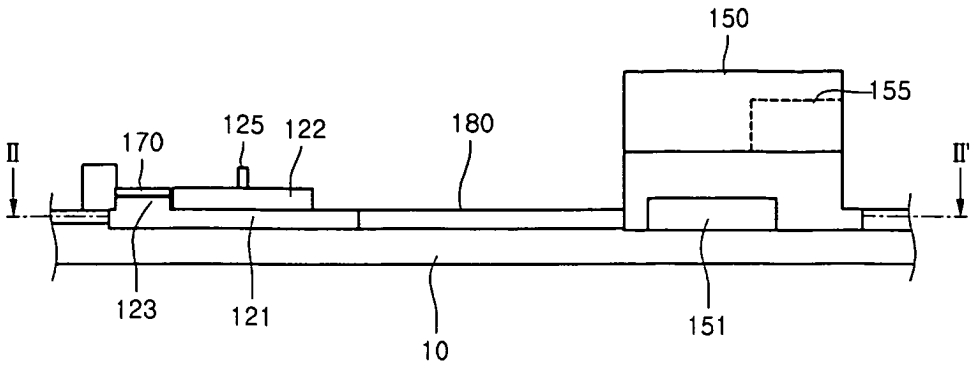


Fig. 6

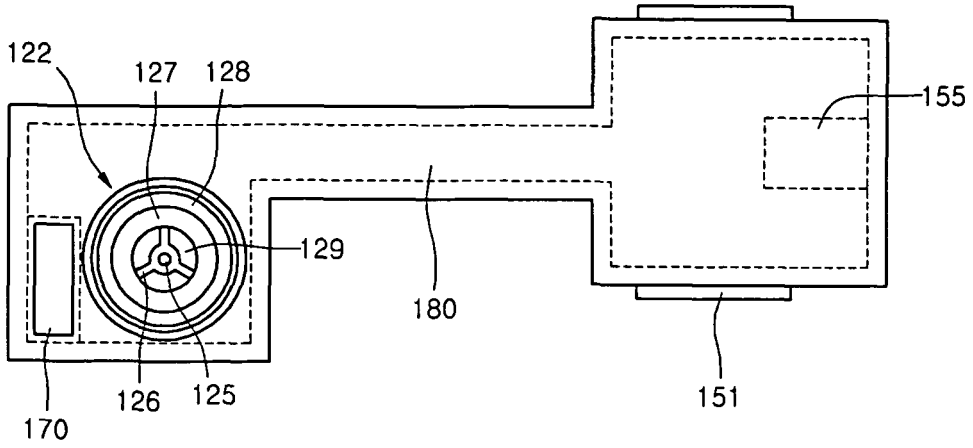


Fig. 7

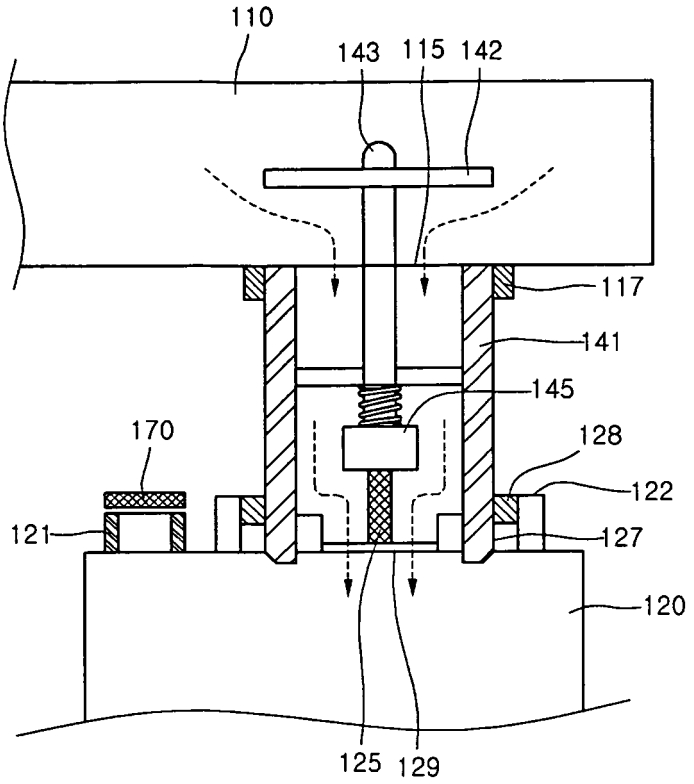


Fig. 8

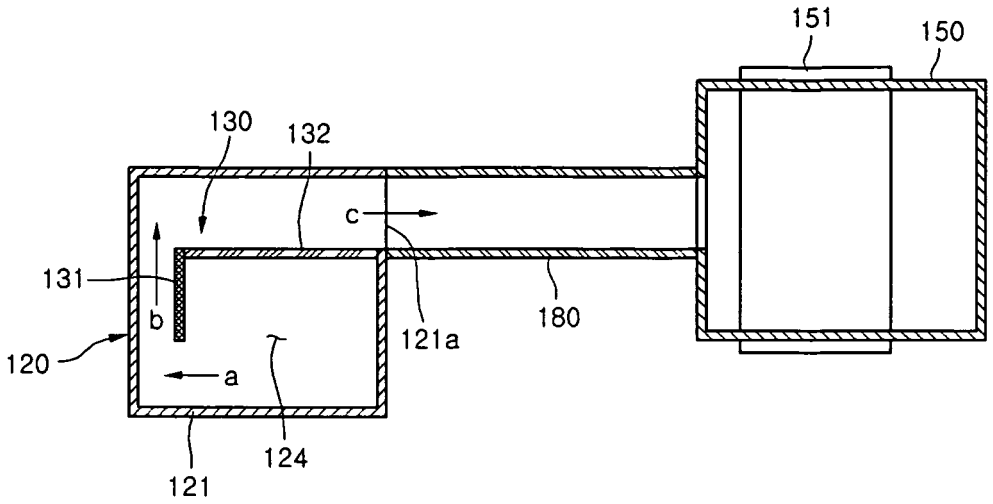


Fig. 9

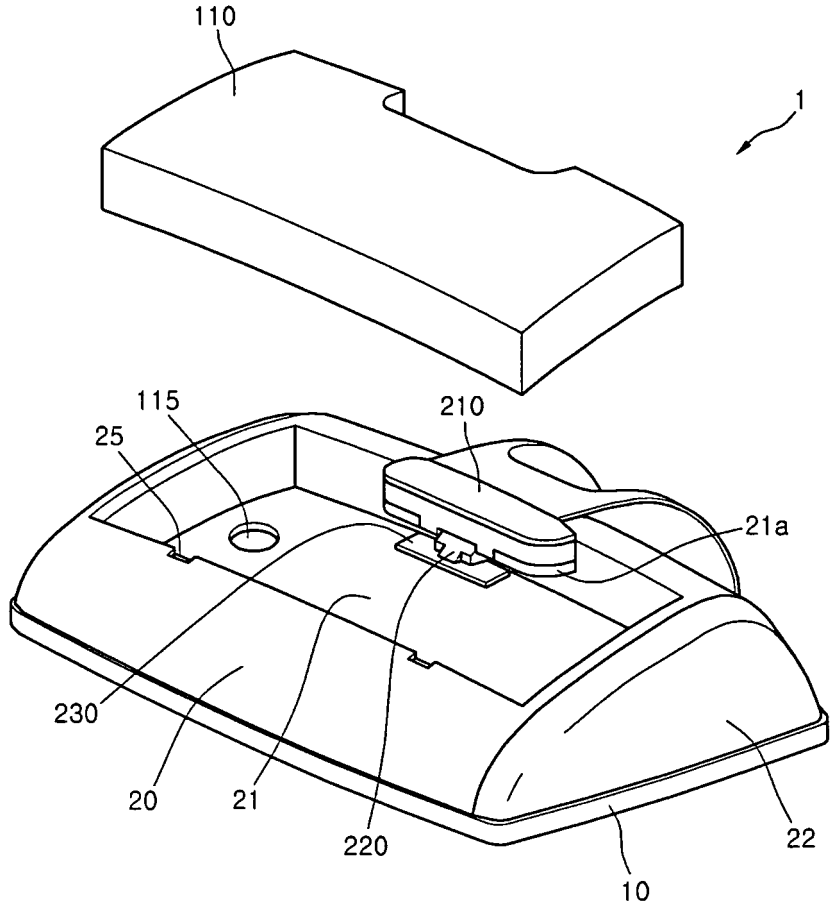


Fig. 10

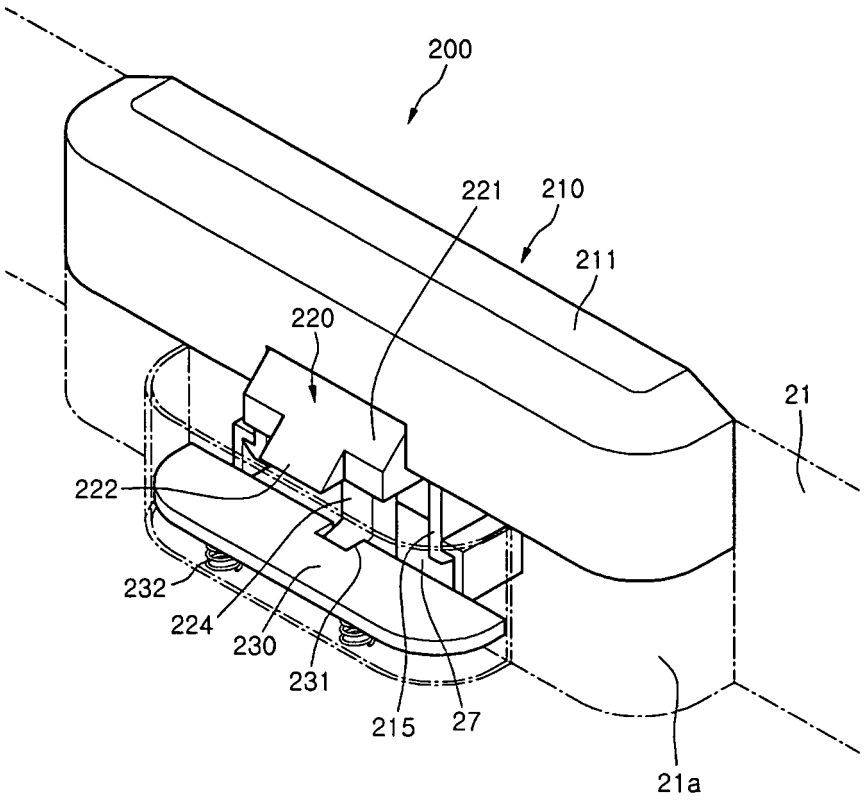


Fig. 11

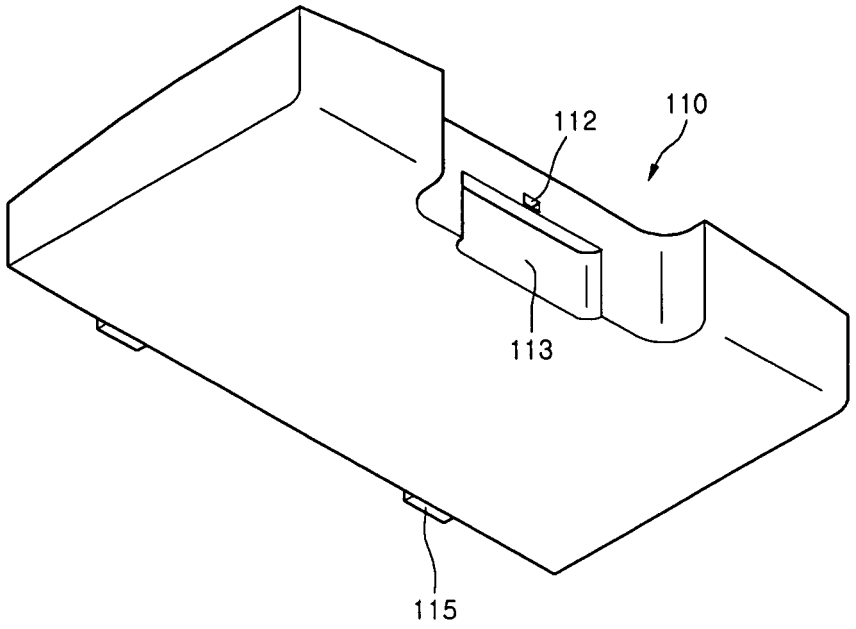


Fig. 12

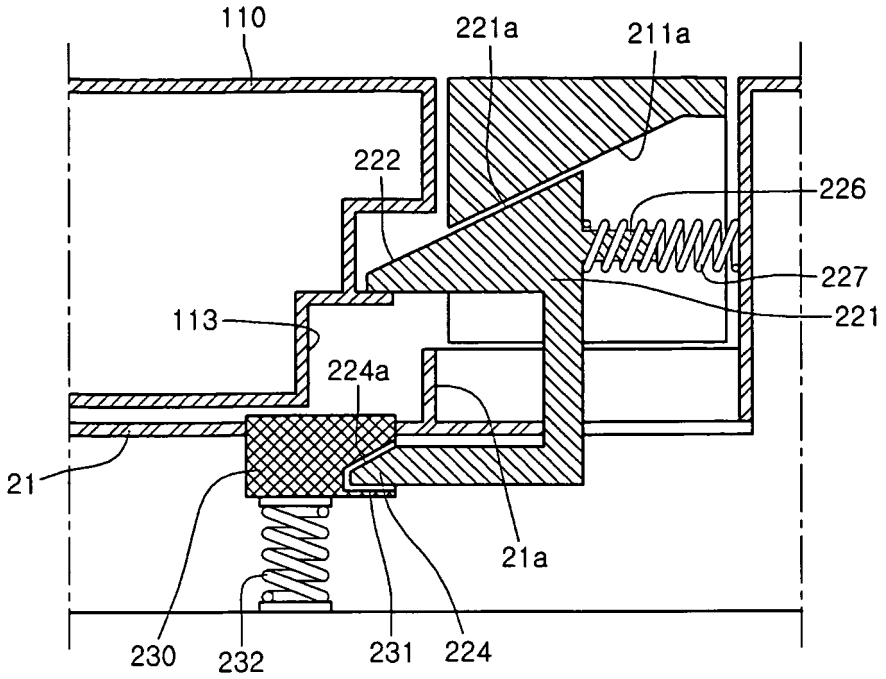


Fig. 13

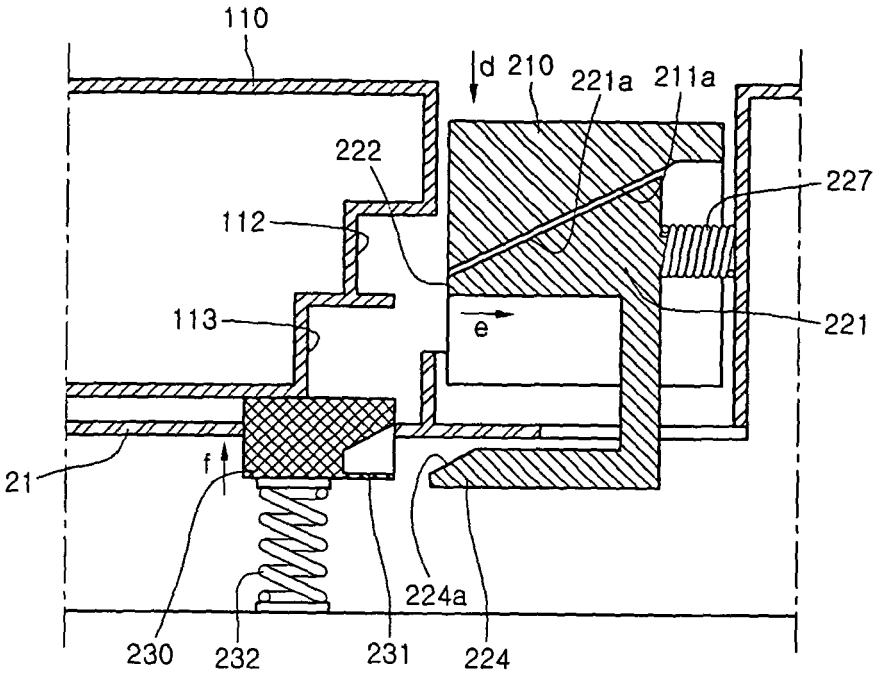

110
d 210
221a
211a
222
227
112
113
e
221
21
f
230
232
231
224
224a

Fig. 14

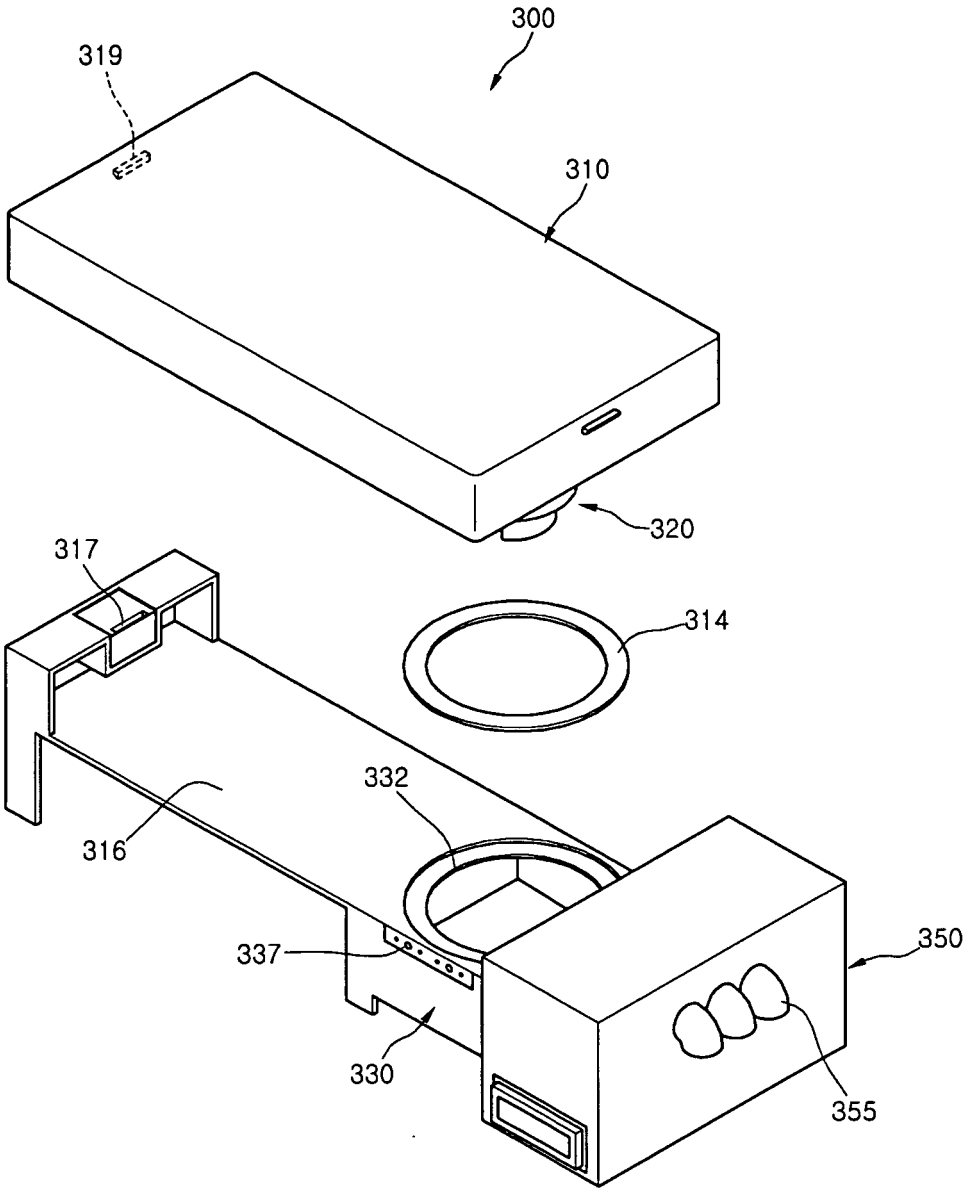


Fig. 15

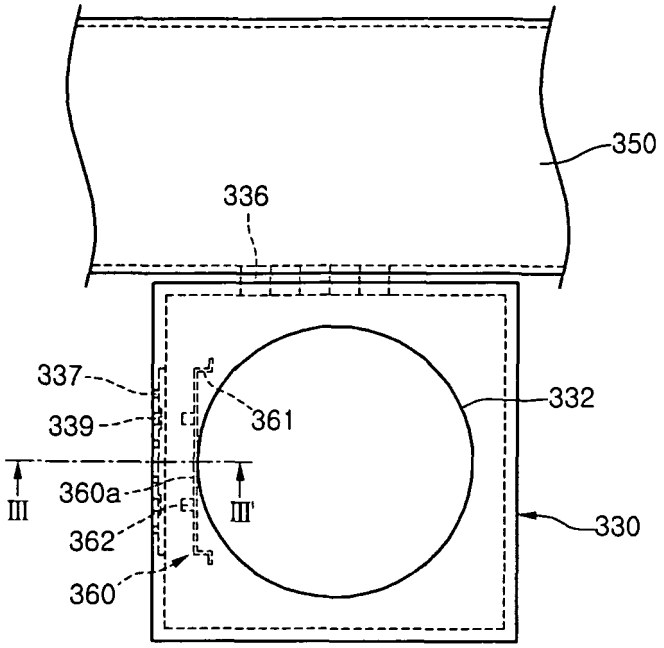
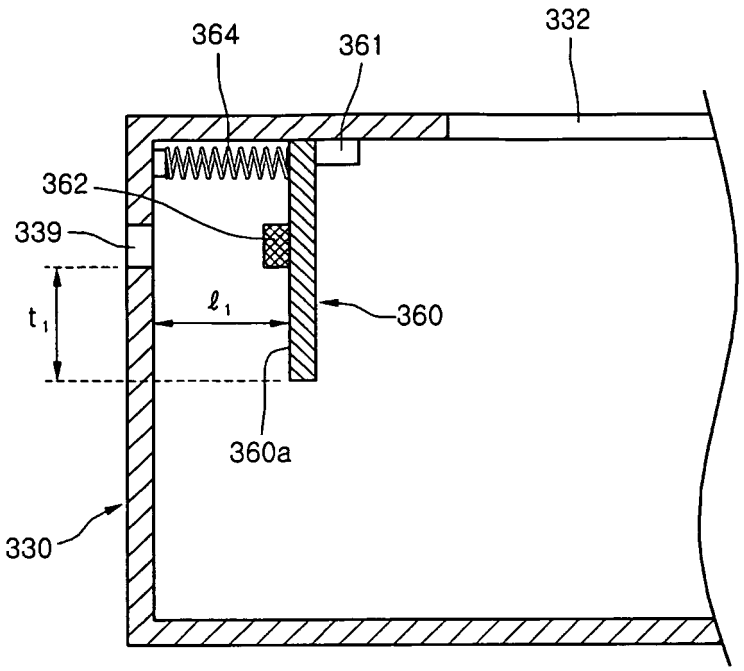


Fig. 16



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2009/002275

A. CLASSIFICATION OF SUBJECT MATTER

A47L 11/34(2006.01)i, A47L 9/02(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC : A47L 09/02, 11/34, 11/40

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Published Korean Utility Model registrations since 1948
Published Korean Utility Model applications since 1983
Published Japanese Utility Model registrations and Utility Model applications since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS (KIPO internal) & Keywords: "supply", "cistern", "pressure", and "steam"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2002-0027141 A (HAHN, GYUNG HEE) 13 April 2002 See pages 3-4, claims 1-9, figure 1.	1-2, 5-6
Y	KR 20-0428775 Y1 (LEE,SANG MOO) 16 October 2006 See pages 2-3, claims 1-4, figure 1.	1-2, 5-6
A	KR 20-0377729 Y1 (HAN, KYUNG HWAN) 11 March 2005 pages 2-3, claim 1, figure 3.	1-9
A	KR 10-2006-0104731 A (NEWZIRO CO., LTD., HAN, KYUNG HWAN) 09 October 2006 See claims 1-7, figure 2.	1-9

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 NOVEMBER 2009 (27.11.2009)	**01 DECEMBER 2009 (01.12.2009)**
Name and mailing address of the ISA/ Korean Intellectual Property Office Government Complex-Daejeon, 139 Seonsa-ro, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2008)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2009/002275

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-2002-0027141 A	13.04.2002	NONE	-
KR 20-0428775 Y1	16.10.2006	NONE	-
KR 20-0377729 Y1	11.03.2005	NONE	-
KR 10-2006-0104731 A	09.10.2006	NONE	-

Form PCT/ISA/210 (patent family annex) (July 2008)