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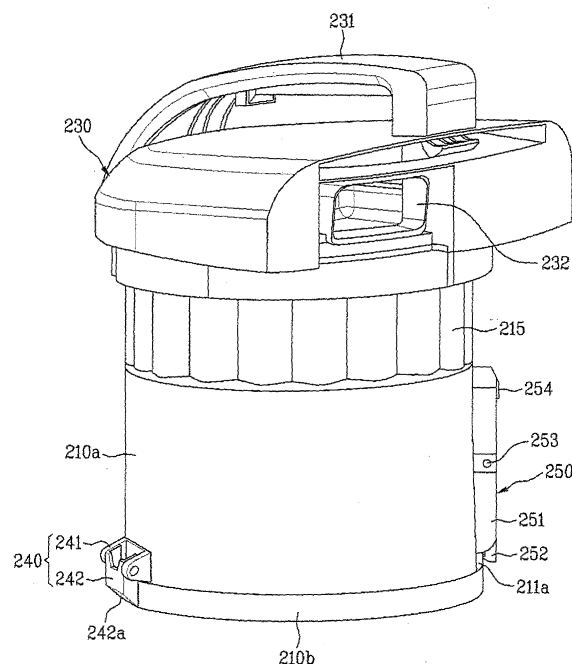
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(54) **Vacuum cleaner with a dust container readily loadable in the cleaner's body**

(57) A vacuum cleaner is disclosed. The present invention includes a cleaner body (100) and a dust collecting container (210) loaded in the cleaner body to collect dust by separating particles from an introduced air, the dust collecting container including a dust collecting body (210a) having an open lower end, a lower panel (210b) rotatably joined to the dust collecting body to open/close the lower end of the dust collecting body, a hinge joint part (240) outwardly projected from the dust collecting body to rotatably join the lower panel to the dust collecting body, and a fixing means (250) for fixing the lower panel not to open the lower panel, wherein the cleaner body comprises a dust collecting container accommodating part having the dust collecting container inserted to be loaded therein and a first insertion recess provided to an inner wall of the dust collecting container accommodating part to have the hinge joint part inserted therein. Accordingly, the present invention facilitates the dust collecting container to be loaded.

FIG. 4



Description

[0001] This application claims the benefit of the Korean Patent Application No. P2005-0000489, filed on January 4, 2005, which is hereby incorporated by reference as if fully set forth herein.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates to a vacuum cleaner. Although the present invention is suitable for a wide scope of applications, it is particularly suitable for facilitating to load a dust collector in the vacuum cleaner.

Discussion of the Related Art

[0003] Generally, a vacuum cleaner according to the present invention includes an intake nozzle moving along a room floor to suck particles such as dust and the like stacked on the room floor, a cleaner body provided with a dust collector separating to collect the particles, and a connecting pipe guiding the particles sucked via the intake nozzle to the cleaner body.

[0004] In this case, an air intake device generating an air-sucking force is provided to the cleaner body. And, a dust collecting container accommodating part is provided to a front portion of the cleaner body to vertically load the dust collector therein.

[0005] A pair of drive wheels are provided to both lateral rear sides of the cleaner body, respectively. And, a caster of a rotary member is provided to a front bottom side of the cleaner body to change a running direction of the cleaner body.

[0006] Meanwhile, the dust collector includes the cylindrical dust collecting container separating to collect particles according to the cyclone principle and a cover provided to an upper part of the dust collector to discharge the collected particles such as dust and the like. If a quantity of the dust collected within the dust collecting container exceeds a prescribed reference, a user opens the cover to empty the dust collecting container for the prevention of the dust collecting performance degradation.

[0007] However, the above-configured related art vacuum cleaner needs to turn the dust collecting container upside down to empty the dust collecting container storing the dust. Hence, it is inconvenient to empty the dust collecting container and a peripheral space around a trash can becomes contaminated again.

[0008] And, in the process of loading the dust collector in the cleaner body, a lower end portion of the dust collector collides with the dust collecting container accommodating part to make it difficult to load the dust collector.

[0009] Moreover, in the process of loading the dust collector in the cleaner body, a lower end portion of the dust collecting container hits an upper rim of the dust

collecting container accommodating part to be broken.

[0010] Furthermore, the loaded dust collector is easy to shake or rock, whereby it is difficult to sustain the airtightness between the cleaner body and the dust collector.

SUMMARY OF THE INVENTION

[0011] Accordingly, the present invention is directed to a vacuum cleaner that substantially obviates one or more problems due to limitations and disadvantages of the related art.

[0012] An object of the present invention is to provide a vacuum cleaner, by which dust can be easily discharged and by which a dust collecting container is facilitated to be loaded in a cleaner body.

[0013] Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention may be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

[0014] To achieve these objects and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, a vacuum cleaner according to the present invention includes a cleaner body and a dust collecting container loaded in the cleaner body to collect dust by separating particles from an introduced air, the dust collecting container including a dust collecting body having an open lower end, a lower panel rotatably joined to the dust collecting body to open/close the lower end of the dust collecting body, a hinge joint part outwardly projected from the dust collecting body to rotatably join the lower panel to the dust collecting body, and a fixing means for fixing the lower panel not to open the lower panel, wherein the cleaner body includes a dust collecting container accommodating part having the dust collecting container inserted to be loaded therein and a first insertion recess provided to an inner wall of the dust collecting container accommodating part to have the hinge joint part inserted therein.

[0015] Preferably, the hinge joint part includes a tilted surface tilted from a lower end of the hinge joint part to get farther from a center of the dust collecting body upwardly.

[0016] Preferably, the first insertion recess becomes upwardly widened.

[0017] Preferably, the first insertion recess is configured to have a shape corresponding to the hinge joint part to prevent the dust collecting container from rocking by supporting an outer lateral side of the hinge joint part.

[0018] Preferably, the fixing means is outwardly projected from the dust collecting container and the cleaner body further includes a second insertion recess provided to the inner wall of the dust collecting container to have

the fixing means inserted therein.

[0019] More preferably, the fixing means includes a lever accommodating part provided to an outer lateral side of the dust collecting body to be outwardly projected from the dust collecting body and a lever rotatably joined to an inner wall of the lever accommodating part to be accommodated in the lever accommodating part wherein a hook locking the lower panel is provided to a lower end of the lever.

[0020] More preferably, the first and second insertion recesses are configured to correspond to the hinge joint part and the fixing means to prevent the dust collecting container from rocking by supporting outer lateral sides of the hinge joint part and the fixing means, respectively.

[0021] Preferably, the dust collecting body includes a cylindrical primary cyclone separating the particles from the introduced air according to a cyclone principle wherein an outlet is vertically perforated in an upper end of the primary cyclone to discharge the air and a plurality of secondary cyclones provided along a circumference of the primary cyclone to receive the air discharged from the primary cyclone.

[0022] It is to be understood that both the foregoing general description and the following detailed description of the present invention are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings:

FIG. 1 is a perspective diagram of a cleaner body of a vacuum cleaner according to the present invention;
 FIG. 2 is an exploded perspective diagram of a cleaner body and a dust collector provided to a vacuum cleaner according to the present invention;
 FIG. 3 is a cross-sectional diagram of a dust collector provided to a vacuum cleaner according to one embodiment of the present invention;
 FIG. 4 is a perspective diagram of a dust collector provided to a vacuum cleaner according to one embodiment of the present invention;
 FIG. 5 is a perspective diagram of a hinge joint part provided to the dust collector shown in FIG. 4;
 FIG. 6 is a perspective diagram of a fixing device provided to the dust collector shown in FIG. 4;
 FIG. 7 is a perspective diagram of a cleaner body provided to a vacuum cleaner according to the present invention; and
 FIG. 8 is another perspective diagram of a cleaner body provided to a vacuum cleaner according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0024] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

[0025] A canister type vacuum cleaner as one embodiment of a vacuum cleaner according to the present invention is explained with reference to FIG. 1 and FIG. 2 as follows.

[0026] FIG. 1 is a perspective diagram of a cleaner body of a vacuum cleaner according to the present invention and FIG. 2 is an exploded perspective diagram of a cleaner body and a dust collector provided to a vacuum cleaner according to the present invention.

[0027] Referring to FIG. 1 and FIG. 2, a vacuum cleaner according to the present invention includes an intake nozzle (not shown in the drawings) moving along a room floor to be cleaned to suck air containing particles, a cleaner body 100 provided separate from the intake nozzle, and a connecting pipe (not shown in the drawings) connecting the intake nozzle to the cleaner body 100 to guide the polluted air sucked via the intake nozzle to the cleaner body 100.

[0028] In this case, a nozzle inlet (not shown in the drawing) having a prescribed size is provided to a bottom of the intake nozzle to suck dust piled up on the room floor and the air by an air intake force generated from an air intake device built in the cleaner body 100.

[0029] And, in the cleaner body 100, an electronic part controlling the vacuum cleaner and a motor-fan assembly configuring the air intake device are built.

[0030] In particular, a hose connecting part 110 connected to the connecting pipe is provided to an upper front end of the cleaner body 100, wheels 120 are rotatably provided to both rear sides of the cleaner body 100 to enable the cleaner body 100 to smoothly move on the room floor, respectively, and a caster 130 as a rotating member for changing a direction of the cleaner body 100 is connected to a front bottom of the cleaner body 100.

[0031] A dust collecting container accommodating part 130 is provided to a front portion of the cleaner body 100. A dust collector 200 is detachably loaded in the dust collecting container accommodating part 130. The dust collector 200 plays a role in separating to collect particles such as dust and the like from the air introduced into the dust collector 200 via the intake nozzle and the connecting pipe.

[0032] The air discharged from the dust collector 200 is discharged to a rear side of the cleaner body 100 via a prescribed passage configured within a rear portion of the cleaner body 100 and the motor-fan assembly (not shown in the drawing).

[0033] Meanwhile, the connecting pipe includes an extension pipe formed of a hard material to have one end connected to the intake nozzle, a flexible hose having

one end connected to the other end of the extension pipe and the other end connected to the hose connecting part provided to the front side of the cleaner body 100, and an extension pipe grip provided to the other end of the extension pipe.

[0034] An example of a dust collector 200 provided to a vacuum cleaner according to the present invention is explained with reference to FIG. 3 and FIG. 4 as follows.

[0035] FIG. 3 is a cross-sectional diagram of a dust collector provided to a vacuum cleaner according to one embodiment of the present invention and FIG. 4 is a perspective diagram of a dust collector provided to a vacuum cleaner according to one embodiment of the present invention.

[0036] Referring to FIG. 3 and FIG. 5, a dust collector 200 includes a dust collecting container 210 having an approximately cylindrical shape, a dust collecting container cover 220 opening/closing one end of the dust collecting container 210, and more particularly, an upper end of the dust collecting container 210, and an upper cover 230 detachably assembled to the dust collecting container cover 220 to have a grip 231 at its upper surface.

[0037] In this case, the dust collecting container 210 includes a primary dust collecting part and a secondary dust collecting part to separate and collect particles such as dust and the like. And, a bottom of the dust collecting container 210 includes a lower panel 211 to open/close a bottom of a dust collecting body 210a of which lower end is open.

[0038] The primary dust collecting part includes a primary dust separating part and a primary dust storing part 212. And, the primary dust separating part substantially includes a cylindrical receptacle provided within the dust collecting container 210.

[0039] And, the secondary dust collecting part includes a secondary dust separating part provided to a circumference of the primary dust collecting part to separate the particles from the air discharged from the primary dust collecting part and a secondary dust storing part 213.

[0040] In the present invention, the primary dust separating part includes a primary cyclone 214 separating particles by a cyclone system, while the secondary dust separating part includes a plurality of small secondary cyclones 215 provided along a circumference of the primary cyclone 214.

[0041] In particular, the primary cyclone 214 is provided to a central portion of the dust collecting container 210 along its axial direction and has a cylindrical receptacle shape of which lower end is open. A first inlet 214a communicating with the hose connecting part 110 is provided to an upper lateral side of the primary cyclone 214. And, a first outlet 214b perforated in a vertical direction is formed at a central portion of a ceiling of the primary cyclone 214.

[0042] In this case, the first inlet 214a guides the polluted air introduced from outside in a tangential direction of the primary cyclone 214. Hence, the air introduced into

the first inlet 214a can flow spirally along an inner wall of the primary cyclone 214.

[0043] A plurality of the small secondary cyclones 215 built in one body of an outer wall of the primary cyclone 214, i.e., an outer wall of the dust collecting body 210a are arranged on the primary cyclone 214 in a circumferential direction. An upper end of each of the secondary cyclones 215 is projected from an upper end of the primary cyclone 214 to a prescribed height.

[0044] Meanwhile, a lateral side of each of the secondary cyclones 215 projected higher than the upper end of the primary cyclone 214 is cut in a vertical direction to configure a second inlet (not shown in the drawings) communicating with the first outlet 214b. An upper end of each of the secondary cyclones 215 is open to configure a second outlet 215b.

[0045] Meanwhile, a lower portion of the secondary cyclone 215 configures a cone portion 215d having a decreasing diameter downwardly. A lower end of the secondary cyclone 215 configures a particle discharging hole 215b perforated vertically to discharge the particles such as dust and the like.

[0046] In this case, the secondary cyclones 215 are built in one body to be adjacent to one another. Hence, air is prevented from leaking between the secondary cyclones 215.

[0047] The dust collecting container cover 220 is mounted on the secondary cyclones 215.

[0048] Third outlets 221, which are vertically perforated, are provided to an edge portion of the dust collecting container cover 220 to oppose the second outlets 215b of the secondary cyclones 215, respectively.

[0049] The upper cover 230 having an open lower end is detachably assembled to an upper portion of the dust collecting container cover 220.

[0050] For this, three hanging protrusions (not shown in the drawings) are provided to an outer circumference of the dust collecting container cover 220. And, three hanging recesses (not shown in the drawings) are provided to an inner circumference of the upper cover 230 so that the hanging protrusions 222 can be fitted into the hanging recesses, respectively. It is a matter of course that the positions and shapes of the hanging protrusions and recesses can be variously modified.

[0051] A fourth outlet 232 is provided to a rear side of the upper cover 230 to discharge air to a prescribed passage provided to a rear portion of the cleaner body 100. And, a prescribed space is provided within the upper cover 230 to communicate with the fourth outlet 232.

[0052] Preferably, a filter accommodating part is provided to the inner space of the upper cover 230 to accommodate a filter (not shown in the drawings) filtering off micro-dust from the air discharged via the third outlets 221.

[0053] The dust having been separated by the above-configured primary cyclone 214 and the above-configured secondary cyclones 215 is preferentially stored in a dust storing part configured by an outer wall of the dust

collecting container 210 and the lower panel 211 and is then discharged outside by gravity if the lower panel 211 is open.

[0054] The dust storing part includes the primary dust storing part 212 and the secondary dust storing part 213. The primary dust storing part 212 stores the dust separated by the primary cyclone 214, whereas the secondary dust storing part 213 stores the dust separated by the secondary cyclones 215.

[0055] In this case, the primary and secondary dust storing parts 212 and 213 are connected in one body of the lower sides of the secondary cyclones 215 and are partitioned from each other by a boundary wall 216 having an approximately cylindrical shape of which radius is smaller than that of the outer wall of the dust collecting container 210.

[0056] A lower end of the boundary wall 216 extends to a bottom of the dust collecting container 210, i.e., an upper lateral side of the lower panel 211.

[0057] Hence, the boundary wall 216 prevents the primary and secondary dust storing parts 212 and 213 from communicating with each other.

[0058] In addition to the above-explained configuration, the vacuum cleaner according to the present invention further includes an exhaust member 217 vertically provided within the primary cyclone 214 to have a multitude of perforated holes formed at its later side to communicate with the first outlet of the primary cyclone 214 and a guide rib 218 provided to the primary cyclone 214 to guide the air introduced via the first inlet 214a.

[0059] In this case, the exhaust member 217 is provided in an axial direction to a center of the primary cyclone 214 and preferably has an approximately conoid shape, of which upper end is open and of which lower end is closed, having a downwardly decreasing diameter.

[0060] This is to prevent the dust descending along the inner wall of the primary cyclone 214 from being affected by a sucking force of the exhaust member 217 since a speed of a spiral flow tends to decrease toward a lower side of the primary cyclone 214.

[0061] Preferably, the upper end of the exhaust member 217 is detachably assembled to a rim of the first outlet 214b. Preferably, a ring type sealing member (not shown in the drawings) is provided between the upper end of the exhaust member 217 and the first outlet 214 to sustain airtightness in-between.

[0062] Preferably, a scatter-preventing member 219 is provided beneath the exhaust member 217 to prevent the dust stored in the primary dust storing part 212 from being scattered.

[0063] The scatter-preventing member 219 plays a role in preventing the dust collected in the primary dust storing part 212 from ascending by a spiral flow to be introduced into the second cyclones 215.

[0064] Preferably, an upper surface of the scatter-preventing member 219 is tilted downwardly. In particular, the scatter-preventing member 219 has a conoid shape of which diameter increases downwardly.

[0065] Meanwhile, the lower panel 210b is rotatably joined to the dust collecting body 210a. In particular, the lower panel 210b is rotatably joined to the dust collecting body 210a by the hinge joint part 240. In this case, the hinge joint part 240 is projected toward an outside of the dust collecting body 210a to prevent a dust collecting space within the dust collecting container 210 from being reduced.

[0066] A tilted surface 242a is formed at a lower portion of the hinge joint part 240. The tilted surface 242a is configured to get farther from a center of the dust collecting container 210 in an upper direction. Hence, it is able to prevent the hinge joint part 240 or the dust collecting container accommodating part 130 from being broken when the hinge joint part 240 hits the dust collecting container accommodating part 130 in loading the dust collecting container 210.

[0067] Referring to FIG. 5 and FIG. 6, the hinge joint part 240 includes a first joining portion 241 provided to a lateral side of the dust collecting body 210a and a second joining portion 242 provided to a lateral side of the lower panel 210b to be rotatably joined to the first joining portion 241.

[0068] In this case, the first joining portion 241 includes a pair of support walls (not shown in the drawings) protruding from a lower end of the lateral side of the dust collecting body 210. And, a hinge hole (not shown in the drawing) is formed at each of the support walls.

[0069] The second joining portion 242 protrudes from the lateral side of the lower panel 210b. A pair of hinge protrusions (not shown in the drawings) protrude from both lateral sides of an upper part of the second joining portion 242 to be fitted into the hinge holes, respectively. And, a pair of the hinge protrusions configure a hinge shaft as a rotative center of the lower panel 210b.

[0070] Alternatively, the hinge protrusions are provided to the first joining portion 241 and the hinge holes are provided to the second joining portion 242.

[0071] In the above-description, the hinge joint part 240 is projected from the lateral side of the dust collecting body 210a. This is because a dust collecting capacity of the dust collecting container is lowered as much as a volume of the hinge joint part 240 if the hinge joint part 240 is provided within the dust collecting body 210a instead of protruding from the lateral side of the dust collecting body 210a.

[0072] A first tilted surface 242a is provided to a lower end corner of the second joining portion 242 to be tilted as a prescribed angle.

[0073] In this case, in the process of loading the dust collector 200 in the dust collecting container accommodating part 130 downwardly over the cleaner body 100, the first tilted surface 242a prevents the hindrance of loading the dust collector 200. For example, the first tilted surface 242a can prevent that the dust collector 200, e.g., the hinge joint part 240 hits the corner portion of the dust collecting container accommodating part 130 to be broken or caught thereon.

[0074] In particular, the lower end corner of the first tilted surface 242a is formed at the bottom of the second joining portion 242 and the upper end corner of the first tilted surface 242a is formed at an outer lateral side of the second joining portion 242.

[0075] Of course, the entire bottom of the second joining portion 242 can be tilted upwardly and outwardly to configure the first tilted surface. Optionally, the first tilted surface 242a can be flat or curved.

[0076] In addition to the above-explained configuration, in the process of loading the dust collector 200 in the dust collecting container accommodating part 130, the hinge joint part 240 externally projected from the dust collecting container 210 can slide to be smoothly loaded without being caught on the upper rim of the dust collecting container accommodating part 130 due to the first tilted surface 242a despite hitting the upper rim of the dust collecting container accommodating part 130. Furthermore, in case that the hinge joint part 240 hits one side of the dust collecting container 130, the corresponding shock is dispersed to prevent the breakage of the hinge joint part 240.

[0077] And, the dust collecting container 210 includes a fixing device 250 fixing the lower panel 210 to lock.

[0078] In this case, the fixing device 250 is projected outside the dust collecting body 210a.

[0079] The fixing device 250 is provided to a position approximately opposite to the hinge joint part 240 or to an outer circumference of the dust collecting body 210a to be spaced apart with a prescribed interval from the hinge joint part 240 in a circumferential direction.

[0080] The fixing device 250 includes a lever accommodating part 251 provided to the outer lateral side of the dust collecting body 210 to be outwardly projected from the dust collecting body 210 and a lever 252 rotatably joined to an inner wall of the lever accommodating part 251 to be accommodated in the lever accommodating part 251.

[0081] In this case, a hook is provided to a lower end of the lever 252 to hold the lower panel 210b. A fixing protrusion 211a is provided to an outer lateral side of the lower panel 210b to be projected in a radial direction of the lower panel.

[0082] A pair of rotative protrusions 253 are formed at both lateral sides of the lever 252, respectively. The rotative protrusions 253 are fitted into a pair of shaft holes formed at both inner walls of the lever accommodating part 251 to be rotatably supported, respectively.

[0083] A push protrusion 254 is provided to an upper outer lateral side of the lever 252 to open the lower panel 210b. An elastic member (not shown in the drawings) is provided to an upper inner lateral side of the lever 252 to elastically support the lever 252.

[0084] And, the fixing device 250 is preferably provided to a position facilitating an operation of the fixing device 250 while the grip 231 of the dust collector provided to the upper portion of the dust collector 200 in a front-to-rear direction is grabbed.

[0085] In addition to the above-explained configuration, a first insertion recess 131 corresponding to the hinge joint part 240 and a second insertion recess 132 corresponding to the fixing device 250 are preferably provided to the cleaner body 100.

[0086] Referring to FIG. 7 and FIG. 8, the first and second insertion recesses 131 and 132 are formed at an inner wall of the dust collecting container 130 to have the hinge joint part 240 and the fixing device 250 inserted therein, respectively. And, the first and second insertion recesses 131 and 132 are configured to have shapes corresponding to the hinge joint part 240 and the fixing device 250, respectively, thereby supporting the outer lateral sides of the hinge joint part 240 and the fixing device 250 to prevent the dust collecting container 210 from shaking or rocking.

[0087] And, each of the first and second insertion recesses 131 and 132 is provided to the inner wall of the dust collecting container accommodating part 130 in a vertical direction to preferably have a shape getting wider upwardly.

[0088] Moreover, a second tilted surface 131a is provided to an inner wall of the first insertion recess 131 to correspond to the first tilted surface 242a.

[0089] Optionally, either the first or second insertion recess 131 or 132 can be provided to the inner wall of the dust collecting container accommodating part 130. Preferably, both of the first and second insertion recess 131 and 132 are provided to the inner wall of the dust collecting container accommodating part 130.

[0090] An operation of the vacuum cleaner according to the present invention is explained as follows.

[0091] First of all, once the vacuum cleaner is driven, the external polluted air is introduced into the primary cyclone 214 via the intake nozzle and the connecting pipe.

[0092] The air introduced into the primary cyclone 214 is not directly introduced into the exhaust member 217 by the first inlet 214a and the guide rib 218 but is guided in the direction tangential to the inner wall of the primary cyclone 214 to form the spiral flow.

[0093] According to the cyclone principle, the relatively large and heavy dust is separated and falls to be stored in the primary dust storing part 212. The dust stored in the primary dust storing part 212 is prevented from being scattered by the scatter-preventing member 219 and the curved boundary wall 216.

[0094] The air, from which the relatively large dust was separated, is discharged to the first outlet 214b communicating with a multitude of the perforated holes provided to the lateral side of the exhaust member 217 and is then introduced into a plurality of the secondary cyclones 215 for dust separation.

[0095] The air, from which the relatively small dust was separated, is introduced into the upper cover 230 via the third outlets 221.

[0096] The air introduced into the upper cover 230 is discharged to a rear side via the fourth outlet 232.

[0097] The air discharged from the fourth outlet 232 passes through the prescribed passage provided to the rear portion of the cleaner body 100 and the motor-fan assembly and is then discharged outside the cleaner body 100.

[0098] Accordingly, the present invention provides the following effects or advantages.

[0099] First of all, in the vacuum cleaner according to the present invention, since the dust collecting container bottom supporting the collected dust can be opened/closed, the collected dust is facilitated to be discharged. The hinge joint part rotatably joining the lower panel to the dust collecting container is projected in the lateral direction of the dust collecting container or the lower panel, it is able to prevent the dust collecting capacity of the dust collecting container from being reduced if the overall size is limited.

[0100] Secondly, in the vacuum cleaner according to the present invention, since the tilted surface is provided to the lower side of the hinge joint part, the dust collector is facilitated to be loaded and the breakage of the hinge joint part is prevented.

[0101] Thirdly, in the vacuum cleaner according to the present invention, since the first insertion recess having the second tilted surface corresponding to the first tilted surface of the hinge joint part is provided to the dust collecting container accommodating part, the dust collector can be stably supported and the shaking or rocking of the dust collector can be prevented.

[0102] Fourthly, in the vacuum cleaner according to the present invention, since the upwardly widened insertions recesses to have the hinge joint part and the fixing device inserted therein are provided to the dust collecting container accommodating part, the dust collector is facilitated to be loaded and can be firmly fixed to the cleaner body without shaking or rocking.

[0103] Finally, in the vacuum cleaner according to the present invention, a plurality of the secondary cyclones are provided to the circumference of the primary cyclone, the dust collector can have a compact configuration and dust collecting performance is enhanced.

[0104] It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the inventions. Thus, it is intended that the present invention covers the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

Claims

1. A vacuum cleaner comprising:

a cleaner body (100); and
a dust collecting container (210) loaded in the cleaner body (100) to collect dust by separating particles from an introduced air, the dust collect-

ing container (210) comprising:

a dust collecting body (210a) having an open lower end;
a lower panel (210b) rotatably joined to the dust collecting body (210a) to open/close the lower end of the dust collecting body (210a);
a hinge joint part (240) outwardly projected from the dust collecting body (210a) to rotatably join the lower panel (210b) to the dust collecting body (210a); and
a fixing means (250) for fixing the lower panel (210b) not to open the lower end of the dust collecting body (210a),

wherein the cleaner body (100) comprises a dust collecting container accommodating part (130) adapted to receive the dust collecting container (210) to be loaded therein by insertion and a first insertion recess (131) provided to an inner wall of the dust collecting container accommodating part (130) to have the hinge joint part (240) inserted therein.

2. The vacuum cleaner of claim 1, wherein the hinge joint part (240) includes a tilted surface (242a) tilted from a lower end of the hinge joint part (240) to extend farther from a center of the dust collecting body (210a) and in an upward direction.

3. The vacuum cleaner of claim 1 or 2, wherein the first insertion recess (131) is widened in an upward direction.

4. The vacuum cleaner of any one of claims 1 to 3, wherein the first insertion recess (131) is configured to have a shape corresponding to the hinge joint part (240) to prevent the dust collecting container (210) from rocking by supporting an outer lateral side of the hinge joint part (240).

5. The vacuum cleaner of any one of claims 1 to 4, wherein the fixing means (250) is outwardly projected from the dust collecting container (210) and wherein the cleaner body (100) further comprises a second insertion recess (132) provided to the inner wall of the dust collecting container (210) to have the fixing means (250) inserted therein.

6. The vacuum cleaner of any one of claims 1 to 5, the fixing means (250) comprising:

a lever accommodating part (251) provided to an outer lateral side of the dust collecting body (210a) so as to project outwardly from the dust collecting body (210a); and
a lever (252) rotatably joined to an inner wall of the lever accommodating part (251) to be ac-

commodated in the lever accommodating part (251), wherein a hook locking the lower panel (210b) is provided to a lower end of the lever (252).

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7. The vacuum cleaner of claim 5, wherein the first and second insertion recesses (131, 132) are configured to correspond to the hinge joint part (240) and the fixing means (250) to prevent the dust collecting container (210) from rocking by supporting outer lateral sides of the hinge joint part (240) and the fixing means (250), respectively.

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8. The vacuum cleaner of any one of claims 1 to 7, the dust collecting body (210a) comprising:

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a cylindrical primary cyclone (214) for separating the particles from the introduced air according to a cyclone principle wherein an outlet is vertically perforated in an upper end of the primary cyclone (214) to discharge the air; and a plurality of secondary cyclones (215) provided along a circumference of the primary cyclone (214) to receive the air discharged from the primary cyclone (214).

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FIG. 1

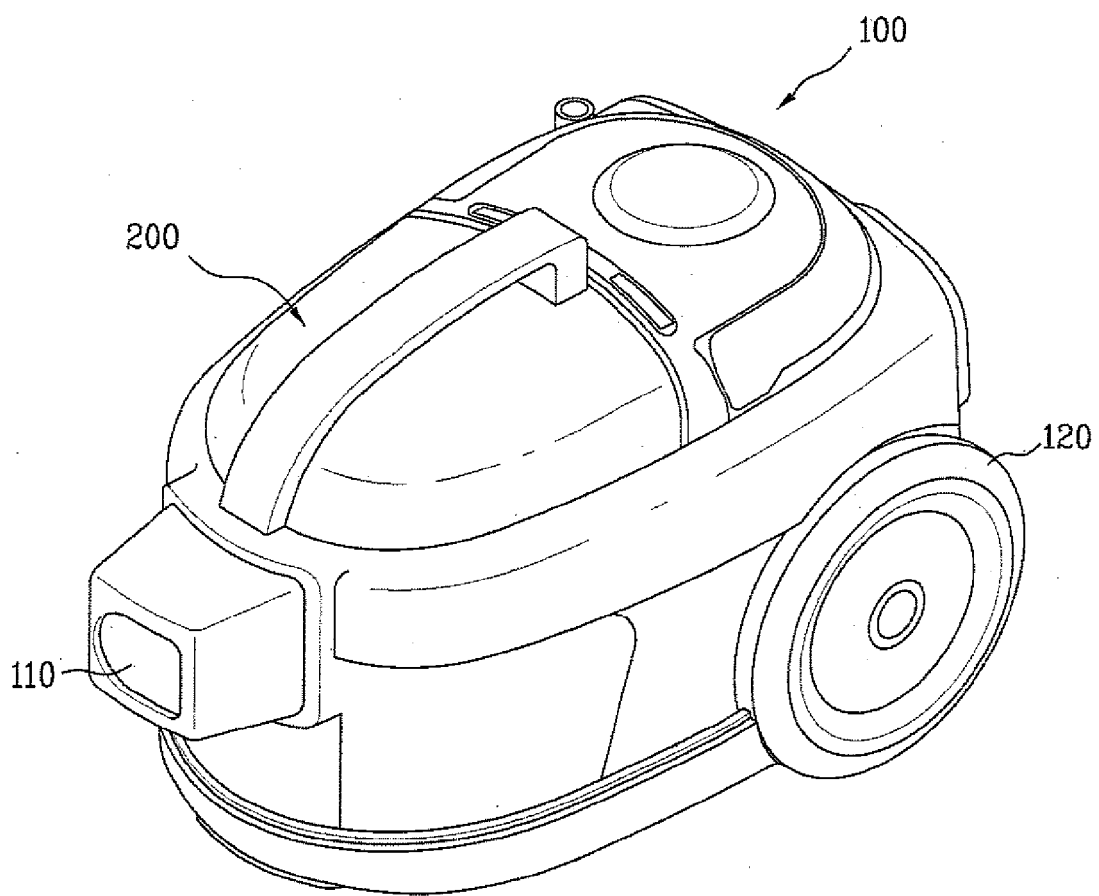


FIG. 2

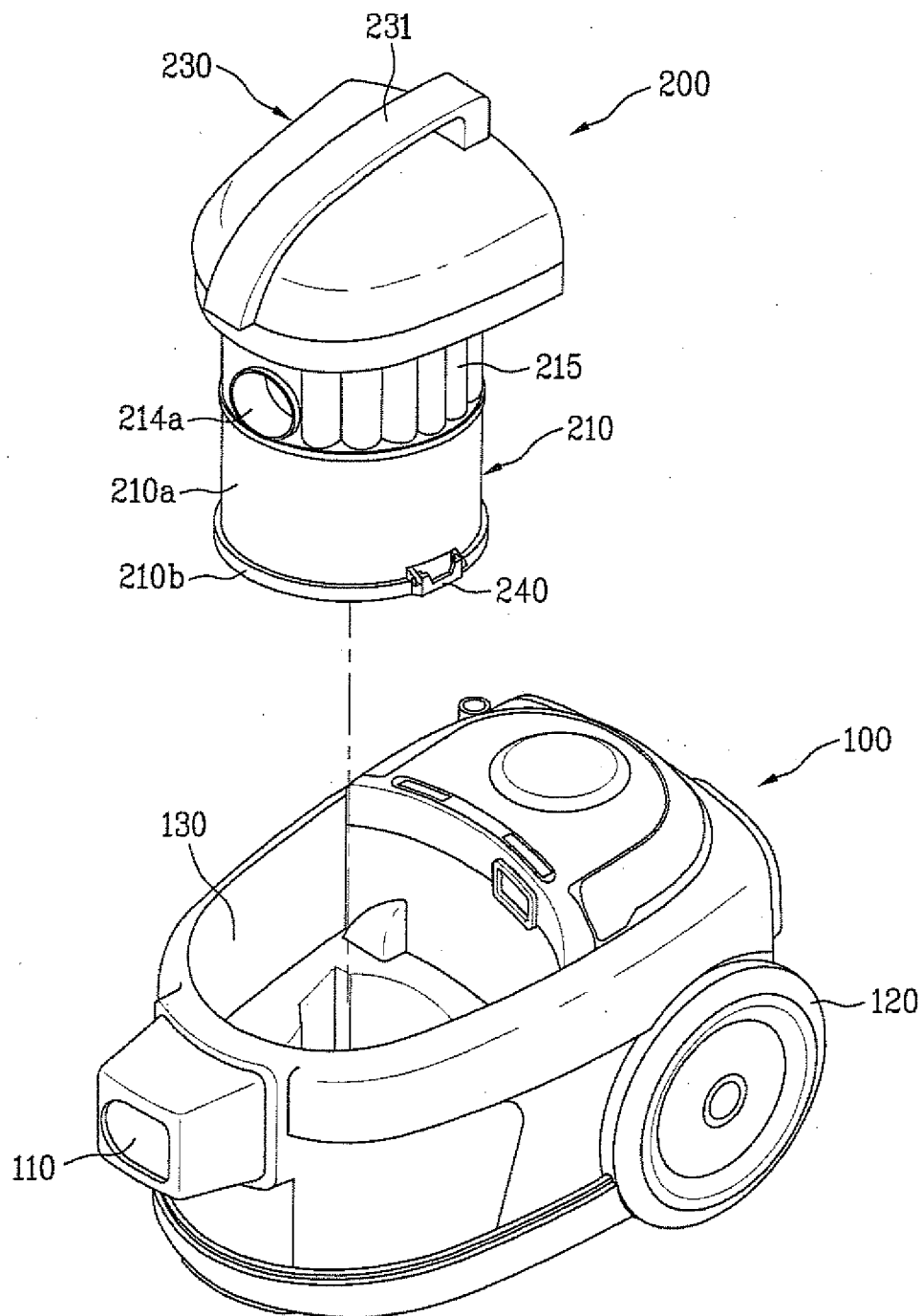


FIG. 3

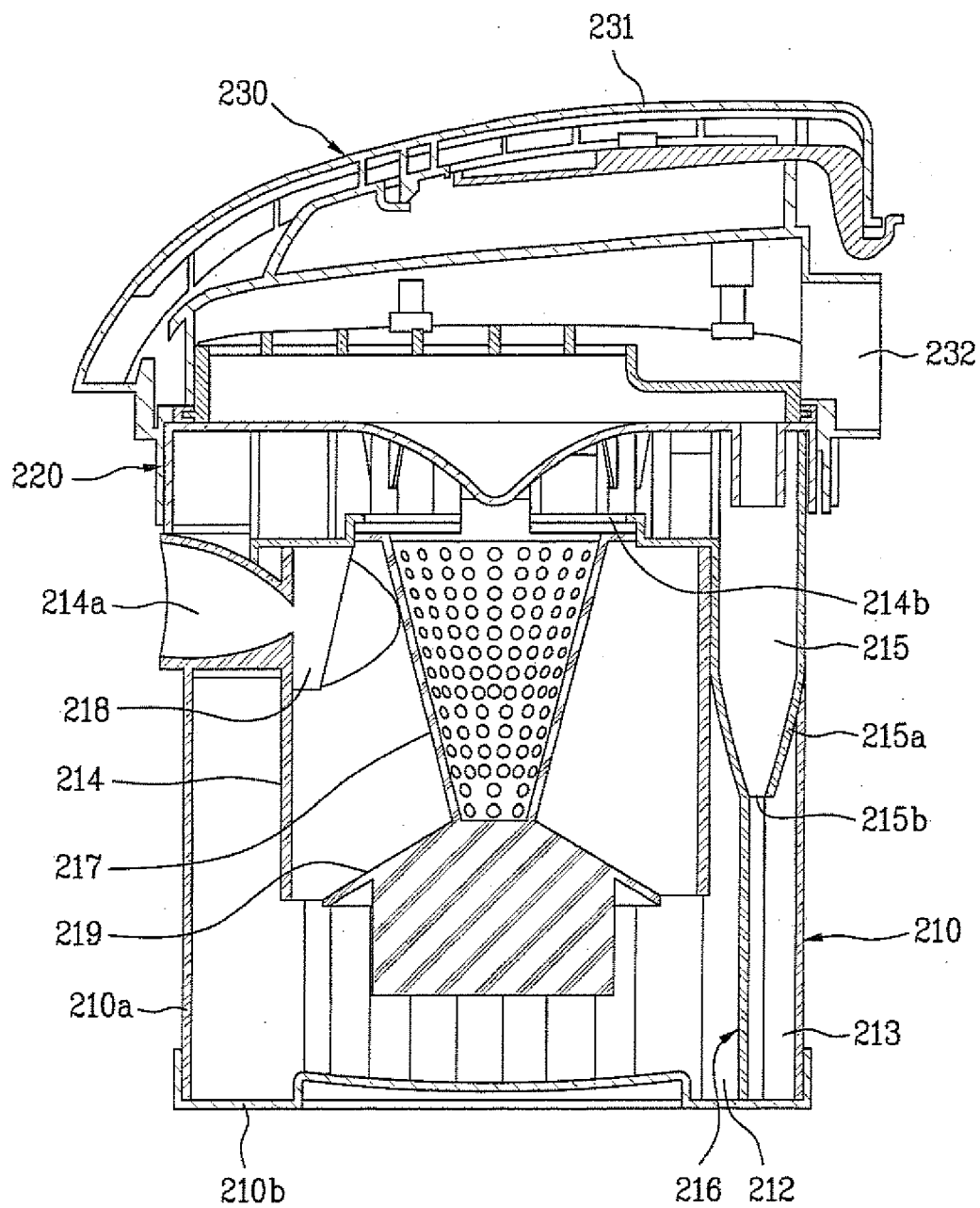


FIG. 4

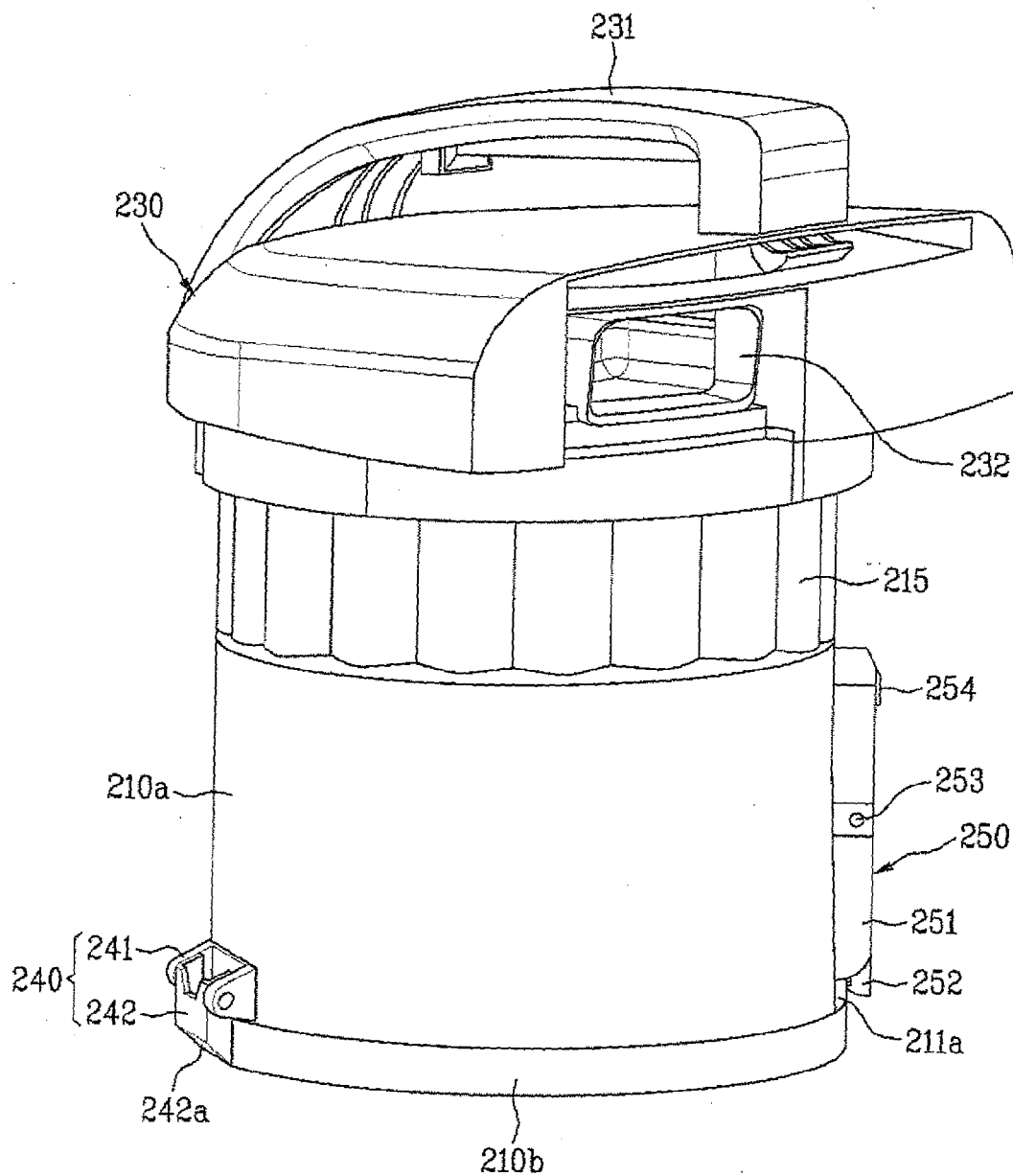


FIG. 5

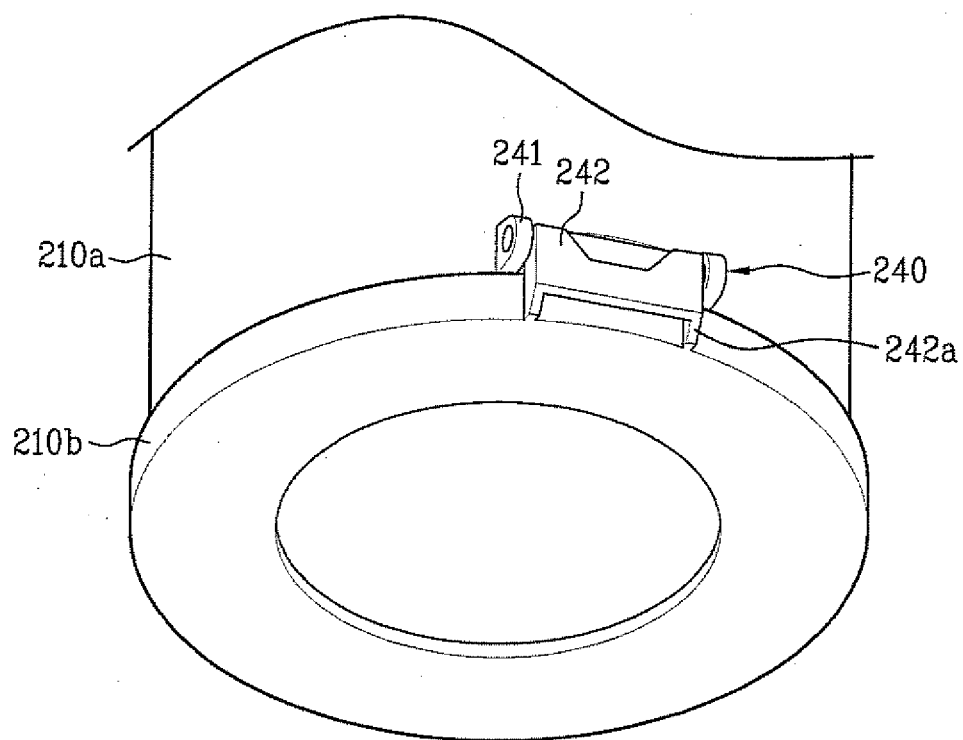


FIG. 6

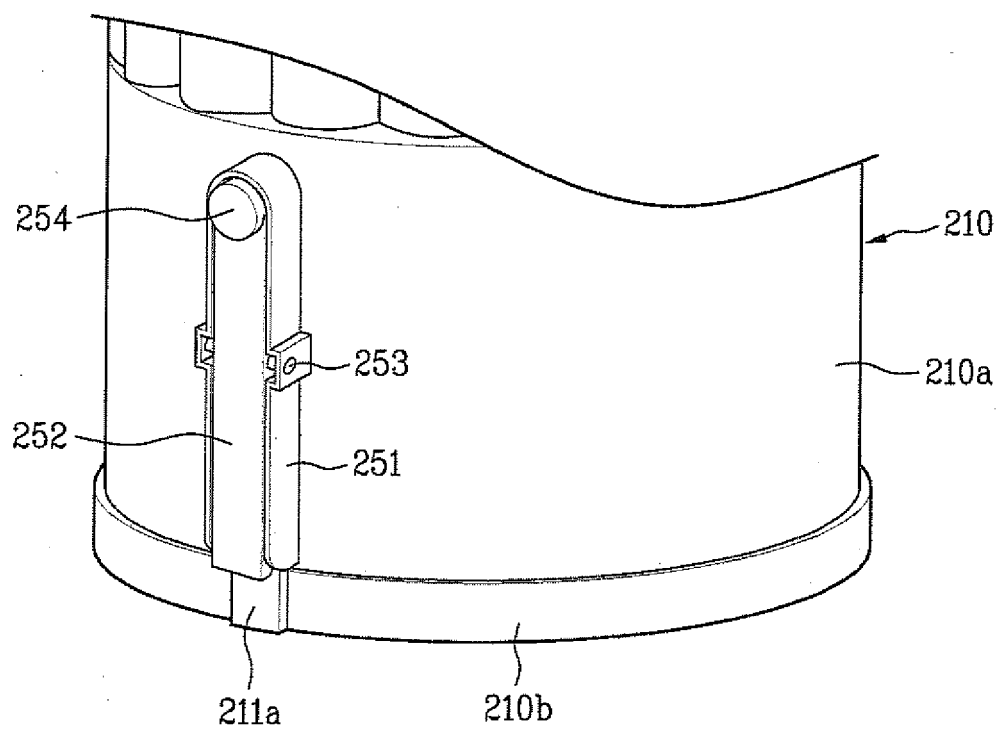


FIG. 7

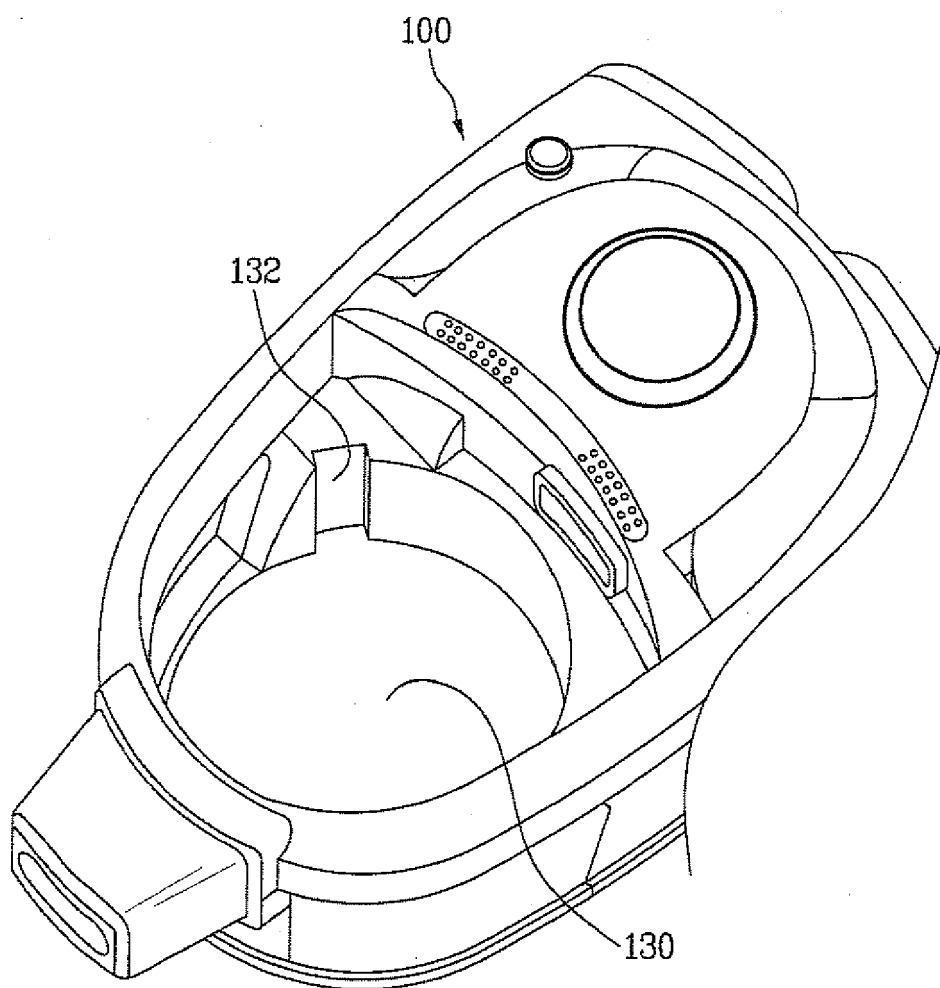


FIG. 8

