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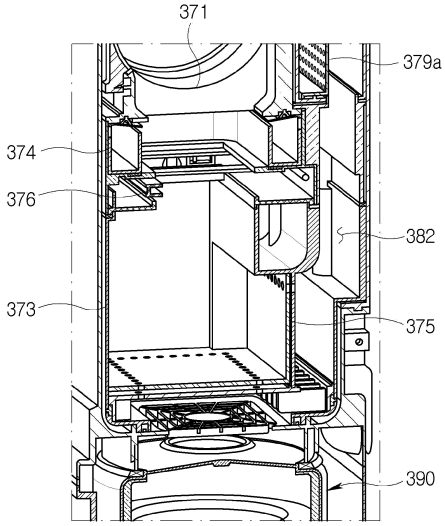
(54) VACUUM CLEANER STATION

(57) The present disclosure relates to a cleaner station configured to suck and collect dust of a cleaner by using a dust bag made of an impermeable material. Disclosed is a cleaner station, including: a housing coupled to a dust bin; a dust collecting motor accommodated in the housing and configured to generate a suction force sucking in dust inside the dust bin; a dust separating part accommodated in the housing, disposed above the dust collecting motor, and configured to separate dust contained in air sucked in by the dust collecting motor; a flow path part including a first suction flow path connecting the dust bin and the dust separating part and a second suction flow path configured to guide air passed through the dust separating part to the dust collecting motor; a dust bag supporting part disposed below the dust separating part and providing a dust bag accommodating space so as to accommodate a dust bag storing dust separated in the dust separating part; and a partition portion disposed in the dust bag supporting part and configured to partition the dust bag accommodating space into a first space and a second space.

[FIG. 13]



EP 4 491 081 A1

Description

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present application claims priority to Korea Patent Application No. 10-2022-0048474, filed on April 19, 2022, the entire contents of which are incorporated herein for all purposes by this reference.

[Technical Field]

[0002] The present disclosure relates to a cleaner station configured to suck and collect dust of a cleaner by using a dust bag made of an impermeable material.

[Background Art]

[0003] In general, a cleaner refers to an electrical appliance that draws in small garbage or dust by sucking air using electricity and fills a dust bin provided in a product with the garbage or dust. Such a cleaner is generally called a vacuum cleaner.

[0004] The cleaners may be classified into a manual cleaner which is moved directly by a user to perform a cleaning operation, and an automatic cleaner which performs a cleaning operation while autonomously traveling. Depending on the shape of the cleaner, the manual cleaners may be classified into a canister cleaner, an upright cleaner, a handy cleaner, a stick cleaner, and the like.

[0005] The canister cleaners were widely used in the past as household cleaners. However, recently, there is an increasing tendency to use the handy cleaner and the stick cleaner in which a dust bin and a cleaner main body are integrally provided to improve convenience of use.

[0006] In the case of the canister cleaner, a main body and a suction port are connected by a rubber hose or pipe, and in some instances, the canister cleaner may be used in a state in which a brush is fitted into the suction port.

[0007] The handy cleaner (hand vacuum cleaner) has maximized portability and is light in weight. However, because the handy cleaner has a short length, there may be a limitation to a cleaning region. Therefore, the handy cleaner is used to clean a local place such as a desk, a sofa, or an interior of a vehicle.

[0008] A user may use the stick cleaner while standing and thus may perform a cleaning operation without bending his/her waist. Therefore, the stick cleaner is advantageous for the user to clean a wide region while moving in the region. The handy cleaner may be used to clean a narrow space, whereas the stick cleaner may be used to clean a wide space and also used to a high place that the user's hand cannot reach. Recently, modularized stick cleaners are provided, such that types of cleaners are actively changed and used to clean various places.

[0009] In addition, recently, a robot cleaner configured to perform a cleaning operation by itself without manipulation of a user has been used. The robot cleaner travels by itself in an area to be cleaned and sucks in debris such as dust and the like from a floor, thereby automatically cleaning an area to be cleaned.

[0010] However, it was cumbersome for the user to empty a dust bin each time because of a small capacity of the dust bin storing the sucked dust of the conventional handy cleaner, the stick cleaner, and the robot cleaner.

[0011] Further, there is a problem of causing an adverse effect to the health of the user because dust scatters when emptying the dust bin.

[0012] Moreover, when the remaining dust is not removed from the dust bin, the suction force of the cleaner has declined.

[0013] In addition, there is a problem of an offensive odor caused by residue of the dust bin when the remaining dust of the dust bin is not removed.

[0014] As a first prior art literature, the Korea Patent No. 2161708 discloses a station which includes a dust bag.

[0015] The first prior art literature includes a station to which a dust bin is coupled, and a dust bag is disposed in the station. Here, the dust bag is coupled to an inside of a housing of the cleaner, and an external surface of the dust bag is formed of a material which can filter air while air is transmitted therethrough.

[0016] However, in case of the dust bag which is permeable or semi-impermeable, there is a problem in that dust inside the dust bag may be leaked to the outside of the dust bag, and the offensive odor may be leaked to the outside of the dust bag.

[0017] As a second prior art literature, the Korea Patent No. 2021-0128783 discloses a station which includes a dust bag formed of a vinyl material.

[0018] In the second prior art literature, a docking station to which a dust bin of a cleaner is coupled is disclosed and a dust storing part is disposed in the docking station. Here, the dust storing part includes a roll vinyl and the roll vinyl is unfolded downward by the weight of dust falling from the dust bin of the cleaner.

[0019] In case where the dust bag made of the vinyl material is selected as in the second prior art literature, there is an effect of preventing a problem such as leakage of dust or an offensive odor.

[0020] However, it is difficult to allow the roll vinyl to have a suitable volume only through the weight of the dust sucked into the dust bin of the cleaner. If the volume of the roll vinyl cannot be suitably expanded, dust which should be collected in the vinyl may run backward to the outside of the station, which is deterioration of a dust collecting efficiency. Therefore, inconvenience for the user to expand the roll vinyl manually may be caused.

[DISCLOSURE]

[Technical Problem]

[0021] The present disclosure is thought of in order to

solve the above-mentioned problems, and a purpose of the present disclosure is preventing leakage of the dust or the offensive odor to the outside of the dust bag.

[0022] Another purpose of the present disclosure is to allow the dust bag to automatically expand while dust is collected.

[0023] Still another purpose of the present disclosure is preventing a phenomenon where the dust bag runs backward in a wrong direction because a force expanding the dust bag is weakened.

[Technical Solution]

[0024] One embodiment is a cleaner station, including: a housing coupled to a dust bin; a dust collecting motor accommodated in the housing and configured to generate a suction force sucking in dust inside the dust bin; a dust separating part accommodated in the housing, disposed above the dust collecting motor, and configured to separate dust contained in air sucked in by the dust collecting motor; a flow path part including a first suction flow path connecting the dust bin and the dust separating part and a second suction flow path configured to guide air passed through the dust separating part to the dust collecting motor; a dust bag supporting part disposed below the dust separating part and providing a dust bag accommodating space so as to accommodate a dust bag storing dust separated in the dust separating part; and a partition portion disposed in the dust bag supporting part and configured to partition the dust bag accommodating space into a first space and a second space.

[0025] In the cleaner station according to an embodiment of the present disclosure, the dust bag supporting part may include: a supporting part main body forming an external appearance of the dust bag accommodating space; and an air hole formed in the supporting part main body and configured to communicate the second suction flow path and the dust bag accommodating space with each other.

[0026] In the cleaner station according to an embodiment of the present disclosure, the partition portion may include an air hole configured to communicate the second space and the first space with each other.

[0027] In the cleaner station according to an embodiment of the present disclosure, at least some of air sucked by the dust collecting motor may flow through a bypass suction path connected to the second suction flow path, the second space, and the dust collecting motor.

[0028] In the cleaner station according to an embodiment of the present disclosure, at least some of air sucked by the dust collecting motor may flow through a bypass suction path connected to the second suction flow path, the second space, and the dust collecting motor.

[0029] In the cleaner station according to an embodiment of the present disclosure, the dust bag may be formed of an impermeable material.

[0030] In the cleaner station according to an embodiment of the present disclosure, when the dust collecting motor is driven, the dust bag may expand by a negative pressure formed in the dust bag accommodating space.

[0031] In the cleaner station according to an embodiment of the present disclosure, in order not to interrupt an airflow of the second space disposed on one side, the partition portion may be configured to support an external appearance of the expanded dust bag on another side.

[0032] In the cleaner station according to an embodiment of the present disclosure, the cleaner station may further include: a pre-filter configured to filter debris from air which has passed through the dust separating part.

[0033] In the cleaner station according to an embodiment of the present disclosure, when the dust collecting motor is driven, a main suction flow path through which sucked air flows from the second suction flow path directly to the dust collecting motor may be formed.

[0034] In the cleaner station according to an embodiment of the present disclosure, a first bypass flow path through which sucked air flows to the dust collecting motor through the second suction flow path, the second space, and the first space may be formed.

[0035] In the cleaner station according to an embodiment of the present disclosure, a second bypass flow path through which sucked air flows to the dust collecting motor through the second suction flow path, and the second space may be formed.

[0036] In the cleaner station according to an embodiment of the present disclosure, an airflow of the first bypass suction flow path may be maintained or blocked according to a degree of expansion of the dust bag, and an airflow of the second bypass suction flow path may be constantly maintained regardless of the degree of expansion of the dust bag.

[Advantageous Effect]

[0037] In the cleaner station according to the present disclosure, because a dust bag made of an impermeable material is provided, it is possible to prevent a leakage problem of dust or an offensive odor which is a problem of a dust bag made of a semi-impermeable or a permeable material.

[0038] In addition, in the cleaner station according to the present disclosure, when the dust collecting motor is driven, the sucked air flows through a first bypass suction path which passes through a dust bag accommodating space in which a dust bag is accommodated, and a negative pressure is applied to the dust bag accommodating space, thereby the dust bag expands automatically. Therefore, it is advantageous that there is no inconvenience of manually unfolding the dust bag.

[0039] In addition, in the cleaner station according to the present disclosure, even when the first bypass suction path is blocked because the dust bag expands to the fullest in the dust bag accommodating space, the sucked air flows through a second bypass suction path which

passes through a clearance separated from the dust bag accommodating space, and the negative pressure in the dust bag accommodating space is maintained. Therefore, the backflow phenomenon by which the dust bag runs backward in a wrong direction can be prevented because a force expanding the dust bag is not weakened.

[0040] The effects of the present invention are not limited to the above-described effects and other effects which are not described herein may be derived by those skilled in the art from the following description of the embodiments of the present invention.

[Description of Drawings]

[0041]

FIG. 1 is a view of a cleaner in a cleaner system according to an embodiment of the present disclosure.

FIG. 2 is a view of a cleaner of FIG. 1 when viewed from a different angle.

FIG. 3 is a view for describing a lower surface of a dust bin of a cleaner in a cleaner system according to an embodiment of the present disclosure.

FIG. 4 is a view for describing a cleaner system according to an embodiment of the present disclosure.

FIG. 5 is a view for describing a coupling part in a cleaner station according to an embodiment of the present disclosure.

FIG. 6 is a view for describing a fixing unit in a cleaner station according to an embodiment of the present disclosure.

FIG. 7 is a view illustrating a state in which a door closes a dust passage hole.

FIG. 8 is a view illustrating a state in which a door opens a dust passage hole.

FIG. 9 is a view for describing a relationship between a cleaner and a cover opening unit in a cleaner station according to an embodiment of the present disclosure.

FIG. 10 is a view illustrating arrangement of a dust collecting part and a dust suction module accommodated in a housing in a cleaner station according to an embodiment of the present disclosure.

FIG. 11 is a view for describing arrangement of a flow path part and a flow of sucked air which flows through a flow path part in a cleaner station according to an embodiment of the present disclosure.

FIG. 12 is an enlarged view of a dust collecting part illustrated in FIG. 10.

FIG. 13 is a cross-sectional perspective view of a dust collecting part illustrated in FIG. 10.

FIG. 14 is a separate perspective view of a dust separating part and a dust bag supporting part in a cleaner station according to an embodiment of the present disclosure.

FIG. 15 is a perspective view of a dust bag supporting part in a cleaner station according to an embodiment of the present disclosure.

FIG. 16 is a cross-sectional perspective view for describing an internal structure of a dust bag supporting part in a cleaner station according to an embodiment of the present disclosure.

FIG. 17 is a cross-sectional perspective view illustrating a moving path of sucked air in a dust bag supporting part in a cleaner station according to an embodiment of the present disclosure.

FIGS. 18 to 20 are schematic views for describing a backflow phenomenon of a dust bag when a partition portion is not disposed in a dust bag supporting part.

FIGS. 21 and 22 are schematic view for describing a principle by which a backflow phenomenon of a dust bag is prevented when a partition portion is disposed in a dust bag supporting part.

[Mode for Invention]

[0042] Hereinafter, exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawings.

[0043] The present disclosure may be variously modified and may have various embodiments, and particular embodiments illustrated in the drawings will be specifically described below. The description of the embodiments is not intended to limit the present disclosure to the particular embodiments, but it should be interpreted that the present disclosure is to cover all modifications, equivalents and alternatives falling within the spirit and technical scope of the present disclosure.

[0044] FIG. 1 is a view of a cleaner in a cleaner system according to an embodiment of the present disclosure, FIG. 2 is a view of a cleaner of FIG. 1 when viewed from a different angle, FIG. 3 is a view for describing a lower surface of a dust bin of a cleaner in a cleaner system according to an embodiment of the present disclosure, and FIG. 4 is a view for describing a cleaner system according to an embodiment of the present disclosure.

[0045] Referring to FIGS. 1 to 4, a cleaner system 3 according to the embodiment of the present disclosure may include a cleaner 200 and a cleaner station 300.

[0046] The cleaner system 3 may include a cleaner station 300. A cleaner 200 may be coupled to the cleaner station 300. The cleaner 200 may be coupled to a lateral surface of the cleaner station 300. The cleaner station 300 may remove dust in a dust bin 220 of the cleaner 200.

[0047] First, a structure of the cleaner 200 will be described below with reference to FIGS. 1 to 3.

[0048] The cleaner 200 may mean a cleaner configured to be manually operated by a user. For example, the cleaner 200 may mean a handy cleaner or a stick cleaner.

[0049] The cleaner 200 may be mounted on the cleaner station 300. The cleaner 200 may be supported by the cleaner station 300. The cleaner 200 may be coupled to the cleaner station 300.

[0050] Meanwhile, in the embodiment of the present

disclosure, directions may be defined on the basis of a state in which a bottom surface (lower surface) of the dust bin 220 and a bottom surface (lower surface) of a battery housing 230 are placed on a ground surface.

[0051] In this case, a forward direction may mean a direction in which a suction part 212 is disposed based on a suction motor 214, and a rear direction may mean a direction in which a handle 216 is disposed. Further, on the basis of a state in which the suction part 212 is viewed from the suction motor 214, a right direction may refer to a direction in which a component is disposed at the right, and a left direction may refer to a direction in which a component is disposed at the left. In addition, in the embodiment of the present disclosure, upper and lower sides may be defined in a direction perpendicular to the ground surface on the basis of the state in which the bottom surface (lower surface) of the dust bin 220 and the bottom surface (lower surface) of the battery housing 230 are placed on the ground surface.

[0052] The cleaner 200 may include a main body 210. The main body 210 may include a main body housing 211, the suction part 212, a dust separating part 213, the suction motor 214, an air discharge cover 215, the handle 216, and an operating part 218.

[0053] The main body housing 211 may define an external appearance of the cleaner 200. The main body housing 211 may provide a space that may accommodate therein the suction motor 214 and a filter (not illustrated). The main body housing 211 may be formed in a shape similar to a cylinder.

[0054] The suction part 212 may protrude outward from the main body housing 211. For example, the suction part 212 may be formed in a cylindrical shape with an opened inside. The suction part 212 may be coupled to an extension tube 250. The suction part 212 may provide a flow path (hereinafter, referred to as a 'suction flow path') through which air containing dust may flow.

[0055] The dust separating part 213 may communicate with the suction part 212. The dust separating part 213 may separate dust introduced into the dust separating part 213 through the suction part 212. An internal space of the dust separating part 213 may communicate with an internal space of the dust bin 220.

[0056] For example, the dust separating part 213 may have two or more cyclone parts capable of separating dust using a cyclonic flow. Further, the internal space of the dust separating part 213 may communicate with the suction flow path. Therefore, the air and the dust, which are introduced through the suction part 212, spirally flow along an inner circumferential surface of the dust separating part 213. Therefore, the cyclonic flow may be generated in the internal space of the dust separating part 213.

[0057] The dust separating part 213 is communicated with the suction part 212, and the dust separating part 213 is configured to apply a principle of a dust collector using a centrifugal force so as to separate dust sucked into the main body 210 through the suction part 212.

[0058] The dust separating part 213 may further include a second cyclone that secondarily separates dust from the air discharged from the cyclone. At this instance, the second cyclone may be disposed inside the cyclone to minimize a size of the dust separating part 213. The second cyclone may include a plurality of cyclone bodies arranged in parallel. The air discharged from the cyclone may pass through the plurality of cyclone bodies in a split manner.

[0059] At this instance, an axis of a cyclonic flow of the second cyclone may also extend vertically, an axis of the cyclonic flow of the cyclone and the axis of the cyclonic flow of the second cyclone may be coaxial in a vertical direction, and the axes may be collectively referred to as the axes of the cyclonic flow of the dust separating part 213.

[0060] The suction motor 214 may generate a suction force for sucking air containing dust. The suction motor 214 may be accommodated in the main body housing 211. The suction motor 214 may generate the suction force by means of a rotation. For example, the suction motor 214 may be formed in a shape similar to a cylindrical shape.

[0061] The air discharge cover 215 may be disposed at one side in the axial direction of the main body housing 211. The air discharge cover 215 may accommodate a filter for filtering air. For example, an HEPA filter may be accommodated in the air discharge cover 215.

[0062] The air discharge cover 215 may have an air discharge port for discharging the air introduced by the suction force of the suction motor 214.

[0063] A flow guide may be disposed on the air discharge cover 215. The flow guide may guide a flow of the air to be discharged through the air discharge port.

[0064] The handle 216 may be grasped by the user. The handle 216 may be disposed at a rear side of the suction motor 214. For example, the handle 216 may be formed in a shape similar to a cylindrical shape. Alternatively, the handle 216 may be formed in a curved cylindrical shape. The handle 216 may be disposed at a predetermined angle with respect to the main body housing 211, the suction motor 214, or the dust separating part 213.

[0065] The handle 216 may include a grip portion 216a formed in a column shape so that the user may grasp the grip portion 216a, a first extension portion 216b connected to one end in the longitudinal direction (axial direction) of the grip portion 216a and extending toward the suction motor 214, and a second extension portion 216c connected to the other end in the longitudinal direction (axial direction) of the grip portion 216a and extending toward the dust bin 220.

[0066] An upper surface of the handle 216 may define a partial external appearance of an upper surface of the cleaner 200. Therefore, it is possible to prevent a component of the cleaner 200 from coming into contact with the user's arm when the user grasps the handle 216.

[0067] The first extension portion 216b may extend

from the grip portion 216a toward the main body housing 211 or the suction motor 214. At least a part of the first extension portion 216b may extend in a horizontal direction.

[0068] The second extension portion 216c may extend from the grip portion 216a toward the dust bin 220. At least a part of the second extension portion 216c may extend in the horizontal direction.

[0069] The operating part 218 may be disposed on the handle 216. The operating part 218 may be disposed on an inclined surface formed in an upper region of the handle 216. The user may input an instruction to operate or stop the cleaner 200 through the operating part 218.

[0070] The cleaner 200 may include the dust bin 220. The dust bin 220 may communicate with the dust separating part 213. The dust bin 220 may store the dust separated in the dust separating part 213.

[0071] The dust bin 220 may include a dust bin main body 221, a discharge cover 222, a dust bin compression lever 223, and a compression member (not illustrated).

[0072] The dust bin main body 221 may provide a space capable of storing the dust separated by the dust separating part 213. For example, the dust bin main body 221 may be formed in a shape similar to a cylindrical shape.

[0073] A part of a lower surface (bottom surface) of the dust bin main body 221 may be opened. In addition, a lower extension portion 221a may be formed on the lower surface (bottom surface) of the dust bin main body 221. The lower extension portion 221a may be formed to block a part of the lower surface of the dust bin main body 221.

[0074] The dust bin 220 may include the discharge cover 222. The discharge cover 222 may be disposed on a lower surface of the dust bin 220.

[0075] The discharge cover 222 may be provided to open or close one end in a longitudinal direction of the dust bin main body 221. In more detail, the discharge cover 222 may selectively open or close the lower side of the dust bin 220.

[0076] The discharge cover 222 may include a cover main body 222a and a hinge part 222b. The cover main body 222a may be formed to block a part of the lower surface of the dust bin main body 221. The cover main body 222a may be rotated downward about the hinge part 222b. The hinge part 222b may be disposed adjacent to a battery housing 230. The hinge part 222b may include a torsion spring 222d. Therefore, when the discharge cover 222 is separated from the dust bin main body 221, the cover main body 222a may be supported from the dust bin main body 221, in a state of being rotated at more than a certain angle about the hinge part 222b, by the elastic force of the torsion spring 222d.

[0077] The discharge cover 222 may be coupled to the dust bin 220 by a hook engagement. Meanwhile, the discharge cover 222 may be separated from the dust bin 220 by means of a coupling lever 222c. The coupling lever 222c may be disposed at a front of the dust bin. In more detail, the coupling lever 222c may be disposed on an outer surface at a front of the dust bin 220. When an external force is applied to the coupling lever 222c, the coupling lever 222c may elastically deform a hook extending from the cover main body 222a in order to release the hook engagement between the cover main body 222a and the dust bin main body 221.

[0078] When the discharge cover 222 is closed, the lower surface of the dust bin 220 may be blocked (sealed) by the discharge cover 222 and the lower extension portion 221a.

[0079] The dust bin 220 may further include the dust bin compression lever 223. (Refer to FIG. 2) The dust bin compression lever 223 may be disposed outside the dust bin 220 or the dust separating part 213. The dust bin compression lever 223 may be disposed outside the dust bin 220 or the dust separating part 213 so as to be movable upward and downward. The dust bin compression lever 223 may be connected to the compression member (not illustrated). When the dust bin compression lever 223 is moved downward by an external force, the compression member (not illustrated) may also be moved downward as well. Therefore, it is possible to provide convenience for the user. The compression member (not illustrated) and the dust bin compression lever 223 may return to original positions by an elastic member (not illustrated). In more detail, when the external force applied to the dust bin compression lever 223 is eliminated, the elastic member may move the dust bin compression lever 223 and the compression member (not illustrated) upward.

[0080] The compression member (not illustrated) may be disposed in the dust bin main body 221. The compression member may move in the internal space of the dust bin main body 221. In more detail, the compression member may move upward and downward in the dust bin main body 221. Therefore, the compression member may compress the dust in the dust bin main body 221 downward. In addition, when the discharge cover 222 is separated from the dust bin main body 221 and thus the lower side of the dust bin 220 is opened, the compression member may move from an upper side of the dust bin 220 to a lower side of the of the dust bin 220, thereby removing debris such as residual dust in the dust bin 220. Therefore, it is possible to improve the suction force of the cleaner by preventing the residual dust from remaining in the dust bin 220. Further, it is possible to remove an offensive odor caused by the residual dust by preventing the residual dust from remaining in the dust bin 220.

[0081] The cleaner 200 may include the battery housing 230. A battery 240 may be accommodated in the battery housing 230. The battery housing 230 may be disposed at a lower side of the handle 216. For example, the battery housing 230 may have a hexahedral shape opened at a lower side thereof. A rear surface of the battery housing 230 may be connected to the handle 216.

[0082] The battery housing 230 may include an accommodation portion which may be opened downward. The battery 240 may be attached or detached through the

accommodation portion of the battery housing 220.

[0083] The cleaner 200 may include the battery 240.

[0084] For example, the battery 240 may be separably coupled to the cleaner 200. The battery 240 may be separably coupled to the battery housing 230. For example, the battery 240 may be inserted into the battery housing 230 from the lower side of the battery housing 230. The above-mentioned configuration may improve portability of the cleaner 200.

[0085] Alternatively, the battery 240 may be integrally provided in the battery housing 230. In this case, a lower surface of the battery 240 is not exposed to the outside.

[0086] The battery 240 may supply power to the suction motor 214 of the cleaner 200. The battery 240 may be disposed on a lower portion of the handle 216. The battery 240 may be disposed at a rear of the dust bin 220.

[0087] In a case in which the battery 240 is coupled to the battery housing 230 according to an embodiment, the lower surface of the battery 240 may be exposed to the outside. Because the battery 240 may be placed on the floor when the cleaner 200 is placed on the floor, the battery 240 may be immediately separated from the battery housing 230. In addition, because the lower surface of the battery 240 is exposed to the outside and thus in direct contact with air outside the battery 240, performance of cooling the battery 240 may be improved.

[0088] Meanwhile, in case in which the battery 240 is fixed integrally to the battery housing 230, a quantity of structures for attaching or detaching the battery 240 and the battery housing 230 may be reduced, and as a result, it is possible to reduce an overall size of the cleaner 200 and a weight thereof.

[0089] The cleaner 200 may include the extension tube 250. The extension tube 250 may communicate with a cleaning module 260. The extension tube 250 may communicate with the main body 210. The extension tube 250 may communicate with the suction part 214 of the main body 210. The extension tube 250 may be formed in a long cylindrical shape.

[0090] The main body 210 may be connected to the extension tube 250. The main body 210 may be connected to the cleaning module 260 through the extension tube 250. The main body 210 may generate the suction force by means of the suction motor 214 and provide the suction force to the cleaning module 260 through the extension tube 250. The outside dust may be introduced into the main body 210 through the cleaning module 260 and the extension tube 250.

[0091] The cleaner 200 may include the cleaning module 260. The cleaning module 260 may communicate with the extension tube 250. Therefore, the outside air may be introduced into the main body 210 of the cleaner 200 via the cleaning module 260 and the extension tube 250 by the suction force generated in the main body 210 of the cleaner 200.

[0092] The dust in the dust bin 220 of the cleaner 200 may be collected by gravity into the dust collecting part 470 of the cleaner station 300. At the same time, the dust in the dust bin 220 may be collected into the dust collecting part 370 of the cleaner station 300 by the suction force of the dust collecting motor 391 disposed inside the cleaner station 300. With this configuration, it is possible to remove dust in the dust bin of the cleaner without any additional manipulation, thereby providing the user with convenience. In addition, it is possible to get rid of inconvenience experienced by the user of emptying the dust bin each time. Moreover, it is possible to prevent dust from scattering when the dust bin is emptied.

[0093] The cleaner 200 may be coupled to a lateral surface of a housing 310. In more detail, the main body 210 of the cleaner 200 may be mounted on a coupling part 320. In more detail, the dust bin 220 and the battery housing 230 of the cleaner 200 may be coupled to a coupling surface 321. An outer circumferential surface of the dust bin main body 221 may be coupled to a dust bin guide surface 322. The suction part 212 may be coupled to a suction part guide surface 326 of the coupling part 320. With this configuration, a center axis of the dust bin 220 may be disposed in a direction parallel to the ground surface, and the extension tube 250 may be disposed along a direction perpendicular to the ground surface.

[0094] Hereinafter, configuration of the cleaner station 300 of the present disclosure will be described below.

[0095] Referring to FIG. 4, the cleaner 200 may be coupled to the cleaner station 300. In detail, a main body of the cleaner 200 may be coupled to the lateral surface of the cleaner station 300. In more detail, the dust bin 220 of the cleaner 200 may be coupled to the lateral surface of the cleaner station 300, but may be coupled to one side at which the discharge cover 222 is disposed. Therefore, when the discharge cover 222 is opened, the dust in the dust bin 220 is collected into the cleaner station 300 to be removed from the dust bin 220.

[0096] The cleaner station 300 may include the housing 310. The housing 310 may define an external appearance of the cleaner station 300. In more detail, the housing 310 may be formed in the form of a column including at least one or more outer wall surfaces. For example, the housing 310 may be formed in a shape similar to a quadrangular column.

[0097] The housing 310 may have a space capable of accommodating the dust collecting part 370, and a dust suction module 390.

[0098] The housing 310 may include a bottom surface 311, an outer wall surface 312, and an upper surface 313.

[0099] The bottom surface 311 may support a lower side in a gravitational direction of the dust suction module 390. That is, the bottom surface 311 may support a lower side of the dust collecting motor 391 of the dust suction module 390.

[0100] In this case, the bottom surface 311 may be disposed toward the ground surface. The bottom surface 311 may also be disposed in parallel with the ground surface or disposed to be inclined at a predetermined angle with respect to the ground surface. The above-mentioned configuration may be advantageous in stably

supporting the dust collecting motor 391 and maintaining the balance of an overall weight even when the cleaner 200 is coupled.

[0101] Meanwhile, according to an embodiment, the bottom surface 311 may further include a ground surface support portion 311a configured to increase an area in contact with the ground surface so as to prevent the cleaner station 100 from falling and to maintain the balance. For example, the ground surface support portion 311a may have a plate shape extending from the bottom surface 311, and one or more frames may protrude and extend from the bottom surface 311 along a direction of the ground surface.

[0102] The outer wall surface 312 may mean a surface formed in the gravitational direction or a surface connected to the bottom surface 311. For example, the outer wall surface 312 may mean a surface connected to the bottom surface 311 so as to be perpendicular to the bottom surface 311. In another embodiment, the outer wall surface 312 may be disposed to be inclined at a predetermined angle with respect to the bottom surface 311.

[0103] The outer wall surface 312 may include at least one surface. For example, the outer wall surface 312 may include a first outer wall surface 312a, a second outer wall surface 312b, a third outer wall surface 312c, and a fourth outer wall surface 312d.

[0104] In this case, in the present embodiment, the first outer wall surface 312a may be disposed on the front surface of the cleaner station 300. In this case, the front surface may mean a surface on which the cleaner 200 is exposed in a state in which the cleaner 200 is coupled to the cleaner station 300. Therefore, the first outer wall surface 312a may define an external appearance of the front surface of the cleaner station 300.

[0105] Meanwhile, the directions are defined as follows to understand the present embodiment. In the present embodiment, the directions may be defined in the state in which the cleaner 200 is coupled to the cleaner station 300.

[0106] In the state in which the cleaner 200 is coupled to the cleaner station 300, a direction in which the cleaner 200 is exposed to the outside of the cleaner station 300 may be referred to as a forward direction.

[0107] In another point of view, in the state in which the cleaner 200 is coupled to the cleaner station 300, a direction in which the suction motor 214 of the cleaner 200 is disposed may be referred to as the forward direction. Further, a direction opposite to the direction in which the suction motor 214 is disposed in the cleaner station 300 may be referred to as a rearward direction.

[0108] Further, on the basis of an internal space of the housing 310, a surface facing the front surface may be referred to as a rear surface of the cleaner station 300. Therefore, the rear surface may mean a direction in which the second outer wall surface 312b is formed.

[0109] Further, on the basis of the internal space of the housing 310, a left surface when viewing the front surface may be referred to as a left surface, and a right surface when viewing the front surface may be referred to as a right surface. Therefore, the left surface may mean a direction in which the third outer wall surface 312c is formed, and the right surface may mean a direction in which the fourth outer wall surface 312d is formed.

[0110] The first outer wall surface 312a may be formed in the form of a flat surface, or the first outer wall surface 312a may be formed in the form of a curved surface as a whole or formed to partially include a curved surface.

[0111] The coupling part 320 may be disposed on the first outer wall surface 312a. With this configuration, the cleaner 200 may be coupled to the cleaner station 300 and supported by the cleaner station 300. The specific configuration of the coupling part 320 will be described below.

[0112] Meanwhile, the structure for mounting various types of cleaning modules used for the cleaner 200 may be additionally provided on the first outer wall surface 312a.

[0113] In the present embodiment, the second outer wall surface 312b may be a surface facing the first outer wall surface 312a. That is, the second outer wall surface 312b may be disposed on the rear surface of the cleaner station 300. The second outer wall surface 312b may define an external appearance of the rear surface of the cleaner station 300.

[0114] In the present embodiment, the third outer wall surface 312c and the fourth outer wall surface 312d may mean surfaces that connect the first outer wall surface 312 and the second outer wall surface 112b. In this case, the third outer wall surface 312c may be disposed on the left surface of the cleaner station 300, and the fourth outer wall surface 312d may be disposed on the right surface of the cleaner station 300. Otherwise, the third outer wall surface 312c may be disposed on the right surface of the cleaner station 300, and the fourth outer wall surface 312d may be disposed on the left surface of the cleaner station 300.

[0115] The third outer wall surface 312c or the fourth outer wall surface 312d may be formed in the form of a flat surface, or may be formed in the form of a curved surface as a whole or formed to partially include a curved surface.

[0116] Meanwhile, the structure for mounting various types of cleaning modules 290 used for the cleaner 200 may be additionally provided on the third outer wall surface 312c or the fourth outer wall surface 312d.

[0117] The upper surface 313 may form the top appearance of the cleaner station. That is, the upper surface 313 may refer to a surface that is disposed on the uppermost side in the direction of gravity in the cleaner station and exposed to the outside.

[0118] For reference, in this embodiment, the upper and lower sides may respectively mean upper and lower sides along a direction of gravity (a direction perpendicular to the ground) in a state where the cleaner station 300 is installed on the ground.

[0119] At this time, the upper surface 313 may be

disposed parallel to the ground or inclined at a predetermined angle with the ground.

[0120] A display unit may be disposed on the upper surface 313. For example, the display unit may display the state of the cleaner station 300 and/or the state of the cleaner 200, and may also display information such as a cleaning progress status and a map of a cleaning area.

[0121] Meanwhile, according to the embodiment, the upper surface 313 may be provided detachable from the outer wall surface 312. At this time, when the upper surface 313 is separated, the battery separated from the cleaner 200 may be accommodated in the internal space surrounded by the outer wall surface 312, and a terminal (not illustrated) capable of charging the separated battery may be provided.

[0122] FIG. 5 is a view for describing the coupling part in the cleaner station according to an embodiment of the present disclosure.

[0123] The cleaner station 300 may include the coupling part 320 on which the cleaner 200 is mounted to be coupled thereto. In more detail, the coupling part 320 may be disposed on the first outer wall surface 312a, and the dust bin 220 of the cleaner 200 may be coupled to the coupling part 320. Along with the dust bin 220, the main body 210, and the battery housing 230 of the cleaner 200 may be coupled to the coupling part 320.

[0124] The coupling part 320 may include the coupling surface 321. The coupling surface 321 may be disposed on the lateral surface of the housing 310. For example, the coupling surface 321 may mean a surface formed in the form of a groove which is concave toward the inside of the cleaner station 300 from the first outer wall surface 312a. That is, the coupling surface 321 may mean a surface formed to have a stepped portion together with the first outer wall surface 312a.

[0125] The cleaner 200 may be coupled to the coupling surface 321. For example, the coupling surface 321 may be in contact with the lower surface of the dust bin 220 and the lower surface of the battery housing 230 of the cleaner 200. In this case, the lower surface may mean a surface directed toward the ground surface when the user uses the cleaner 200 or places the cleaner 200 on the ground surface.

[0126] For example, an angle of the coupling surface 321 with respect to the ground surface may be a right angle. Therefore, it is possible to minimize a space of the cleaner station 300 when the cleaner 200 is coupled to the coupling surface 321.

[0127] As another example, the coupling surface 321 may be disposed to be inclined at a predetermined angle with respect to the ground surface. Therefore, the cleaner station 300 may be stably supported when the cleaner 200 is coupled to the coupling surface 321.

[0128] The coupling surface 321 may have a dust passage hole 321a through which air outside the housing 310 may be introduced into the housing 310. The dust passage hole 321a may be formed in the form of a hole corresponding to the shape of the dust bin 220 so that the dust in the dust bin 220 may be introduced into the dust collecting part 370. The dust passage hole 321a may be formed to correspond to the shape of the discharge cover 222 of the dust bin 220. The dust passage hole 321a may be formed to communicate with a flow path part 380 to be described below. (Refer to FIG. 8)

[0129] The coupling part 320 may include the dust bin guide surface 322. The dust bin guide surface 322 may be disposed on the first outer wall surface 312a. The dust bin guide surface 322 may be connected to the first outer wall surface 312a. In addition, the dust bin guide surface 322 may be connected to the coupling surface 321.

[0130] The dust bin guide surface 322 may be formed in a shape corresponding to the outer surface of the dust bin 220. A front outer surface of the dust bin 220 may be coupled to the dust bin guide surface 322. Therefore, it is possible to provide convenience when coupling the cleaner 200 to the coupling surface 321.

[0131] Meanwhile, a protrusion moving hole 322a may be formed in the dust bin guide surface 322, and a push protrusion 351 to be described below may be rectilinearly moved along the protrusion moving hole 322a. (Refer to FIG. 11) In addition, a gear box 355 in which gears and the like of a cover opening unit 350 to be described below, are accommodated may be provided on the lower side of the dust bin guide surface 322 in the direction of gravity. At this time, a guide space 322b in which the push protrusion 351 may move may be formed between the lower surface of the dust bin guide surface 322 and the upper surface of the gear box 355. In addition, the guide space 322b may communicate with a first suction flow path 381 via a bypass hole 322c. That is, the protrusion moving hole 322a, the guide space 322b, the bypass hole 322c, and the first suction flow path 381 may form one flow path. With this configuration, it is advantageous that when the dust collecting motor 391 is operated in a state in which the dust bin 220 is coupled to the coupling part 320, the residual dust and the like remaining in the dust bin 220 and the dust bin guide surface 322 may be sucked through the flow path.

[0132] The coupling part 320 may include guide protrusions 323. The guide protrusions 323 may be disposed on the coupling surface 321. The guide protrusions 323 may protrude upward from the coupling surface 321. Two guide protrusions 323 may be disposed to be spaced apart from each other. A distance between the two guide protrusions 323, which are spaced apart from each other, may correspond to a width of the battery housing 230 of the cleaner 200. With this configuration, convenience may be provided when coupling the cleaner 200 to the coupling surface 321.

[0133] The coupling part 320 may include coupling part sidewalls 324. The coupling part sidewalls 324 may mean wall surfaces disposed on two lateral surfaces of the coupling surface 321 and may be perpendicularly connected to the coupling surface 321. The coupling part sidewalls 324 may be connected to the first outer wall surface 312a. In addition, the coupling part sidewalls 324

may define surfaces connected to the dust bin guide surface 322. Therefore, the cleaner 200 may be stably accommodated.

[0134] The coupling part 320 may include a coupling sensor. The coupling sensor may detect whether the cleaner 200 is coupled to the coupling part 320.

[0135] The coupling sensor may include a contact sensor. For example, the coupling sensor may include a micro-switch. In this case, the coupling sensor may be disposed on the guide protrusion 323. Therefore, when the battery housing 230 or the battery 240 of the cleaner 200 is coupled between the pair of guide protrusions 123, the battery housing 230 or the battery 240 comes into contact with the coupling sensor, such that the coupling sensor may detect that the cleaner 200 is coupled to the cleaner station 300.

[0136] Meanwhile, the coupling sensor may include a non-contact sensor. For example, the coupling sensor may include an infrared (IR) sensor. In this case, the coupling sensor may be disposed on the coupling part sidewall 324. Therefore, when the dust bin 220 or the main body 210 of the cleaner 200 passes the coupling part sidewall 324 and then, reaches the coupling surface 321, the coupling sensor may detect the presence of the dust bin 220 or the main body 210.

[0137] In a state in which the cleaner 200 is coupled to the cleaner station 300, the coupling sensor may face the dust bin 220 or the battery housing 230 of the cleaner 200.

[0138] The coupling sensor may be a means for determining whether the cleaner 200 is coupled and power is applied to the battery 240 of the cleaner 200.

[0139] The coupling part 320 may include the suction part guide surface 326. The suction part guide surface 326 may be disposed on the first outer wall surface 312a. The suction part guide surface 326 may be connected to the dust bin guide surface 322. The suction part 212 may be coupled to the suction part guide surface 326. A shape of the suction part guide surface 326 may correspond to the shape of the suction part 212.

[0140] The coupling part 320 may further include fixing member entrance holes 327. The fixing member entrance hole 327 may be formed in the form of a long hole along the coupling part sidewall 324 so that a fixing member 331 may enter and exit the fixing member entrance hole 327.

[0141] With this configuration, when the user couples the cleaner 200 to the coupling part 320 of the cleaner station 300, the main body 210 of the cleaner 200 may be stably disposed on the coupling part 320 by the dust bin guide surface 322, the guide protrusions 323, and the suction part guide surface 326. Therefore, it is possible to provide convenience when coupling the dust bin 220 and the battery housing 230 of the cleaner 200 to the coupling surface 321.

[0142] The cleaner station 300 may further include a charging portion 328. The charging portion 328 may be disposed on the coupling part 320. The charging portion 328 may be electrically connected to the cleaner 200 which is coupled to the coupling part 320. The charging portion 328 may supply electric power to the battery of the cleaner 200 which is coupled to the coupling part 320.

[0143] In addition, the cleaner station 300 may include a lateral door. The lateral door may be disposed in the housing 310. The lateral door may selectively expose the dust collecting part 370 to the outside. Therefore, the user may easily remove the dust collecting part 370 from the cleaner station 300.

[0144] FIG. 6 is a view for describing a fixing unit in the cleaner station according to an embodiment of the present disclosure.

[0145] Referring to FIG. 6, the cleaner station 300 according to the present disclosure may include the fixing unit 330. The fixing unit 330 may be disposed on the coupling part sidewall 324. In addition, the fixing unit 330 may be disposed on a back surface of the coupling surface 321. The fixing unit 330 may fix the cleaner 200 coupled to the coupling surface 321. In more detail, the fixing unit 330 may fix the dust bin 220 and the battery housing 230 of the cleaner 200 coupled to the coupling surface 321.

[0146] The fixing unit 330 may include the fixing members 331 configured to fix the dust bin 220 and the battery housing 230 of the cleaner 200, and a fixing part motor configured to drive the fixing members 331. In addition, the fixing unit 330 may further include a fixing part link 335 configured to transmit power from the fixing part motor to the fixing members 331.

[0147] The fixing members 331 may be disposed on the coupling part sidewall 324 and provided on the coupling part sidewall 324 so as to reciprocate in order to fix the dust bin 220. In more detail, the fixing members 331 may be accommodated in the fixing member entrance holes 327.

[0148] The fixing members 331 may be disposed at both sides of the coupling part 320, respectively. For example, a pair of two fixing members 331 may be symmetrically disposed with respect to the coupling surface 321.

[0149] The fixing part motor may provide power to move the fixing members 331.

[0150] The fixing part link 335 may convert a rotational force of the fixing part motor into a reciprocating movement of the fixing members 331.

[0151] A stationary sealer 336 may be disposed on the dust bin guide surface 322 so as to seal the dust bin 220 when the cleaner 200 is coupled. With this configuration, when the dust bin 220 of the cleaner 200 is coupled, the cleaner 200 may press the stationary sealer 336 by its own weight, such that the dust bin 220 and the dust bin guide surface 322 may be sealed.

[0152] The stationary sealer 336 may be disposed in an imaginary extension line of the fixing members 331. With this configuration, when the fixing motor operates and the fixing members 331 press the dust bin 220, a circumference of the dust bin 220 at the same height may be sealed.

[0153] According to the embodiment, the stationary sealer 336 may be disposed on the dust bin guide surface 322 and formed in the form of a bent line corresponding to an arrangement of the cover opening unit 350 to be described below.

[0154] Therefore, when the main body 210 of the cleaner 200 is disposed on the coupling part 320, the fixing unit 330 may fix the main body 210 of the cleaner 200. In more detail, when the coupling sensor 325 detects that the main body 210 of the cleaner 200 is coupled to the coupling part 320 of the cleaner station 300, the fixing part motor may move the fixing members 331 to fix the main body 210 of the cleaner 200.

[0155] Therefore, it is possible to improve the suction force of the cleaner by preventing the residual dust from remaining in the dust bin 220. Further, it is possible to remove an offensive odor caused by the residual dust by preventing the residual dust from remaining in the dust bin.

[0156] FIGS. 7 and 8 are views for describing a relationship between the cleaner and a door unit in the cleaner station according to the present disclosure, FIG. 7 is a view illustrating a state in which the door closes the dust passage hole, and FIG. 8 is a view illustrating a state in which the door opens the dust passage hole.

[0157] Referring to FIGS. 7 and 8, the cleaner station 300 of the present disclosure may include a door unit 340. The door unit 340 may be configured to open or close the dust passage hole 321a.

[0158] The door unit 340 may include a door 341, a door motor 342, and a door arm 343.

[0159] The door 341 may be hingedly coupled to the coupling surface 321 and may open or close the dust passage hole 321a. The door 341 may include a door main body 341a.

[0160] The door main body 341a may be formed in a shape capable of blocking the dust passage hole 321a. For example, the door main body 341a may be formed in a shape similar to a circular plate shape.

[0161] On the basis of a state in which the door main body 341a blocks the dust passage hole 321a, the hinge part may be disposed at an upper side of the door main body 341a, and an arm coupling part 341b may be disposed at a lower side of the door main body 341a.

[0162] The door main body 341a may be formed in a shape capable of sealing the dust passage hole 321a. For example, an outer surface of the door main body 341a, which is exposed to the outside of the cleaner station 300, is formed to have a diameter corresponding to a diameter of the dust passage hole 321a, and an inner surface of the door main body 341a, which is disposed inside the cleaner station 300, is formed to have a diameter greater than the diameter of the dust passage hole 321a. In addition, a level difference may be defined between the outer surface and the inner surface. Meanwhile, one or more reinforcing ribs may protrude from the inner surface in order to connect the hinge part and the arm coupling part 341c and reinforce a supporting force of the door main body 341a.

[0163] The hinge part may be a means by which the door 341 is hingedly coupled to the coupling surface 321. The hinge part may be disposed at an upper end of the door main body 341a and may be coupled to the coupling surface 321.

[0164] The arm coupling part 341b may be a means to which the door arm 343 is rotatably coupled. The arm coupling part 341b may be disposed at a lower side of the door main body 341a, may be rotatably coupled to the door main body 341a, and the door arm 343 may be rotatably coupled to the arm coupling part 341b.

[0165] With this configuration, when the door arm 343 pulls the door main body 341a in the state in which the door 341 closes the dust passage hole 321a, the door main body 341a is rotated about the hinge part toward the inside of the cleaner station 300, such that the dust passage hole 321a can be opened. Meanwhile, when the door arm 143 pushes the door main body 341a in the state in which the dust passage hole 321a is opened, the door main body 341a is rotated about the hinge part toward the outside of the cleaner station 300, such that the dust passage hole 321a can be closed.

[0166] Meanwhile, in a state in which the cleaner 200 is coupled to the cleaner station 300, and the discharge cover 220 is separated from the dust bin main body 210, the door 341 may contact the discharge cover 220. In addition, according to a rotation of the door 341, the discharge cover 220 may be rotated in interrelation with the door 341.

[0167] The door motor 342 may provide power for rotating the door 341. In more detail, the door motor 342 may rotate the door arm 343 in a forward direction or a reverse direction. In this case, the forward direction may mean a direction in which the door arm 343 pulls the door 341. Therefore, when the door arm 343 is rotated in the forward direction, the dust passage hole 321a may be opened. In addition, the reverse direction may mean a direction in which the door arm 343 pushes the door 341. Therefore, when the door arm 343 is rotated in the reverse direction, at least a part of the dust passage hole 321a may be closed. The forward direction may be opposite to the reverse direction.

[0168] The door arm 343 may connect the door 341 and the door motor 342 and open or close the door 341 using the power generated from the door motor 342.

[0169] For example, the door arm 343 may include a first door arm 343a and a second door arm 343b. One end of the first door arm 343a may be coupled to the door motor 342. The first door arm 343a may be rotated by the power of the door motor 342. The other end of the first door arm 343a may be rotatably coupled to the second door arm 343b. The first door arm 343a may transfer a force transferred from the door motor 342 to the second door arm 343b. One end of the second door arm 343b may be coupled to the first door arm 343a. The other end of the second door arm 343b may be coupled to the door

341. The second door arm 343b may open or close the dust passage hole 321a by pushing or pulling the door 341.

[0170] The door unit 340 may be opened when the discharge cover 222 of the cleaner 200 is opened. In addition, when the door unit 340 is closed, the discharge cover 222 of the cleaner 200 may also be closed in interrelation with the closure of the door unit 340.

[0171] When the dust in the dust bin 220 of the cleaner 200 is removed, the door motor 342 may rotate the door 341, thereby coupling the discharge cover 222 to the dust bin main body 221. In more detail, the door motor 342 may rotate the door 341 to rotate the door 142 about the hinge part, and the door 342 rotated about the hinge part may push the discharge cover 222 toward the dust bin main body 221.

[0172] FIG. 9 is a view for describing a relationship between the cleaner and the cover opening unit in the cleaner station according to an embodiment of the present disclosure.

[0173] Referring to FIG. 9, the cleaner station 100 according to the present disclosure may include the cover opening unit 350. The cover opening unit 350 may be disposed on the coupling part 320 and may open the discharge cover 222 of the cleaner 200.

[0174] The cover opening unit 350 may include a push protrusion 351, a cover opening motor 352, cover opening gears 353, and a gear box 355.

[0175] The push protrusion 351 may move to press the coupling lever 222c when the cleaner 200 is coupled.

[0176] The push protrusion 351 may be disposed on the dust bin guide surface 322. In more detail, a protrusion moving hole may be formed on the dust bin guide surface 322, and the push protrusion 351 may be exposed to the outside by passing through the protrusion moving hole.

[0177] When the cleaner 300 is coupled, the push protrusion 351 may be disposed at a position at which the push protrusion 351 may push the coupling lever 222c. That is, the coupling lever 222c may be disposed on the protrusion moving hole. In addition, the coupling lever 222c may be disposed in a movement region of the push protrusion 351.

[0178] The push protrusion 351 may rectilinearly reciprocate to press the coupling lever 222c. In more detail, the push protrusion 351 may be coupled to the gear box 355, such that the rectilinear movement of the push protrusion 351 can be guided. The push protrusion 351 may be coupled to the cover opening gears 353 and moved together with the cover opening gears 353 by the movements of the cover opening gears 353.

[0179] The cover opening motor 352 may provide power for moving the push protrusion 351. In more detail, the cover opening motor 352 may rotate a motor shaft in a forward direction or a reverse direction. In this case, the forward direction may mean a direction in which the push protrusion 351 pushes the coupling lever 222c. In addition, the reverse direction may mean a direction in which the push protrusion 351, which has pushed the coupling lever 222c, returns to an original position. The forward direction may be opposite to the reverse direction.

[0180] The cover opening gears 353 may be coupled to the cover opening motor 352 and may move the push protrusion 351 using the power from the cover opening motor 352. In more detail, the cover opening gears 353 may be accommodated in the gear box 355. A driving gear 353a of the cover opening gears 353 may be coupled to the motor shaft of the cover opening motor 352 and supplied with the power. A driven gear 353b of the cover opening gears 353 may be coupled to the push protrusion 351 to move the push protrusion 351. For example, the driven gear 353b may be provided in the form of a rack gear, may be engaged with the driving gear 353a, and may be supplied with the power from the driving gear 353a.

[0181] At this time, a torsion spring 222d may be provided in the discharge cover 222. The discharge cover 222 may be rotated at above a certain angle by the elastic force of the torsion spring 222d, and supported at the rotated position. Therefore, the discharge cover 222 may be opened, thereby communicating the dust passage hole 321a with an inside of the dust bin 220.

[0182] The gear box 355 may be provided in the housing 310 and disposed at the lower side of the coupling part 320 in the gravitational direction, and the cover opening gears 353 may be accommodated in the gear box 355.

[0183] According to the present disclosure, the convenience may be improved since the dust bin 220 may be opened without the user's separate manipulation for opening the discharge cover 222.

[0184] In addition, since the discharge cover 222 is opened in a state in which the cleaner 200 is coupled to the cleaner station 300, there is an effect of preventing dust from being scattered.

[0185] FIG. 10 is a view illustrating arrangement of the dust collecting part and the dust suction module accommodated in the housing in the cleaner station according to an embodiment of the present disclosure, FIG. 11 is a view for describing arrangement of the flow path part and a flow of sucked air which flows through the flow path part in the cleaner station according to an embodiment of the present disclosure, FIG. 12 is an enlarged view of the dust collecting part illustrated in FIG. 10, and FIG. 13 is a cross-sectional perspective view of the dust collecting part illustrated in FIG. 10.

[0186] Referring to FIGS. 10 to 12, the cleaner station 300 may include the dust collecting part 370. The dust collecting part 370 may be disposed in the housing 310. The dust collecting part 370 may be disposed at a lower side of the coupling part 320 in the gravitational direction. In addition, the dust collecting part 370 may be disposed at an upper side of the dust collecting motor 391 in the gravitational direction.

[0187] The dust collecting part 370 may collect dust inside the dust bin 220 of the cleaner 200. In more detail, in a state in which the cleaner 200 is coupled to the

cleaner station 300 and an inside of the dust bin 220 and the flow path part 380 are communicated with each other, when the dust collecting motor 391 is operated, dust inside the dust bin 220 may flow along the flow path part 380 and be collected in the dust collecting part 370.

[0188] The dust collecting part 370 may include a dust separating part 371, a dust bag 372, a dust bag supporting part 373, and a dust bag cartridge 374.

[0189] The dust collecting part 370 may separate dust contained in air introduced into the dust bin 220.

[0190] The dust separating part 371 may be disposed at an upper side than the dust bag 372, the dust bag supporting part 373, the dust bag cartridge 374, and a bonder 376. The dust separating part 371 may be disposed in a longitudinal axis C of the cleaner station 300.

[0191] The dust separating part 371 may be communicated with the first suction flow path 381. The dust separating part 371 may separate dust sucked into the inside through the first suction flow path 381. An internal space of the dust separating part 371 may be communicated with an internal space of the dust bag supporting part 373.

[0192] An embodiment of the dust separating part 371 may be a configuration to which a principle of a dust collector using a centrifugal force is applied so as to separate dust introduced into the housing 310 through the dust passage hole 321a and the first suction flow path 381.

[0193] The dust bag 372 may be disposed inside the housing 310. The dust bag 372 may be disposed at a lower side of the dust separating part 371 in the gravitational direction.

[0194] The dust bag 372 may be formed of an impermeable material. For example, the dust bag 372 may be formed of a vinyl material, and may be a roll vinyl. Such a dust bag 372 may prevent collected dust or an offensive odor inside the dust bag 372 from being leaked outside the dust bag 372 because of a material characteristic.

[0195] The dust bag 372 may be mounted in the housing 310 through the dust bag cartridge 374. As needed, the dust bag 372 may be replaced through the dust bag cartridge 374. That is, the dust collecting part 370 may be defined as a consumable part. In a state in which the dust bag 372 is installed in the housing 310, a volume of the dust bag 372 may be enlarged by the suction force (negative pressure) generated when the dust collecting motor 391 is operated.

[0196] The dust bag 372 inserted into the dust bag cartridge 372 in a roll form or a stacked form is unfolded to form a volume in a pocket shape by the suction force of the dust collecting motor 391. The dust bag 372 may be used to store dust therein, and then, may be bonded and be discarded.

[0197] At this instance, the dust bag 372 in an unfolded state may be accommodated in the internal space of the dust bag supporting part 373. That is, when the dust collecting motor 391 is operated, the dust bag 372 may expand in the internal space of the dust bag supporting part 373.

[0198] The dust bag 372 may store dust separated in the dust separating part 371. An upper area of the dust bag 372 may be cut and bonded by the bonder 376. The dust bag 372 may be separated from the dust bag supporting part 373 in a state in which the upper area thereof is cut and bonded.

[0199] With this configuration, convenience of the user is improved because the user need not tie up the dust bag in which dust is collected.

[0200] The dust bag supporting part 373 may support the dust bag 372. The dust bag supporting part 373 may accommodate the dust bag 372 in the internal space thereof, when the dust bag 372 expands. The dust supporting part 373 may support an external appearance of the expanded dust bag 372.

[0201] The dust bag supporting part 373 may be disposed below the dust separating part 371 in a form in which an upper surface is opened. With this configuration, dust separated in the dust separating part 371 may fall to and collected in the dust bag 372 inside the dust supporting part 373.

[0202] The dust bag supporting part 373 may be disposed below the dust bag cartridge 374. With this configuration, when the dust bag 372 expands downward from the dust bag cartridge 374, at least a part of the dust bag 372 may be accommodated in the internal space of the dust bag supporting part 373.

[0203] The dust bag supporting part 373 may be disposed below the bonder 376. With this configuration, the expanded dust bag 372 may be bonded and cut by the bonder 376, and the cut dust bag 372 may fall by the gravity and be accommodated in the dust bag supporting part 373. Therefore, the user need not withdraw the closed dust bag 372 which is fully bonded in the upper part with dust stored inside so as to discard it. Therefore, when the user deals with the dust bag 372, convenience is improved because there is no concern of scattering dust.

[0204] Meanwhile, the dust bag supporting part 373 may be withdrawably provided in the internal space of the housing 310.

[0205] In more detail, a structure which guides a rectilinear movement of the dust bag supporting part 373 may be provided in the dust bag supporting part 373. As a possible example, a plurality of wheels may be provided at a lower side of the dust bag supporting part 373, and the wheels may make the dust bag supporting part 373 be withdrawn to the outside of the housing 310. As another possible example, a guide rail may be formed on an upper surface or a side surface of the dust bag supporting part 373, thereby the dust bag supporting part 373 can be withdrawn to the outside of the housing 310 in a sliding manner.

[0206] With this configuration, the user may open a side door (not illustrated) of the cleaner station 300, pull the dust bag supporting part 373 to withdraw the dust bag

372 to the outside of the housing 310. Therefore, according to the present disclosure, the user may easily withdraw the dust bag and discard it.

[0207] The dust bag cartridge 374 may be separably coupled to the housing 310 and may provide the dust bag 372.

[0208] The dust bag cartridge 374 may be detachably coupled to the housing 310. Though not illustrated, a structure to which the dust bag cartridge 374 is coupled may be formed inside the housing 310, and the user may insert the dust bag cartridge into the inside of the housing 310. In addition, in a state in which the dust bag cartridge 374 is coupled to the housing 310, when the user pulls out the dust bag cartridge 374 to the outside of the cleaner station 300, the dust bag cartridge 374 may be separated from the housing 310. With this configuration, the user may easily mount or separate the dust bag cartridge 374 on or from the housing.

[0209] The dust bag 372 may be provided in the dust bag cartridge 374. For example, at least a part of the dust bag 372 in a roll form may be coupled to the dust bag cartridge 374, and the dust bag 372 may expand in a direction of the dust bag supporting part 373 according to the operation of the dust collecting motor 391. In addition, as the dust bag 372 is bonded according to the operation of the bonder 376, a part of the dust bag 372 may be separated from the dust bag cartridge 374. With this configuration, convenience of the user may be improved because the user need not tie up the dust bag in which dust is collected.

[0210] The dust bag cartridge 374 may be disposed below the dust separating part 371. For example, an upper surface of the dust bag cartridge 374 may be in contact with a lower surface of the dust separating part 371. At this instance, a sealer configured to block leakage of the debris may be provided on the upper surface of the dust bag cartridge 374 and/or the lower surface of the dust separating part 371. With this configuration, the debris separated in the dust separating part 371 may be prevented from being leaked to the outside and may be collected into the inside of the dust bag 372.

[0211] The dust bag cartridge 374 may be dispose at an upper side of the bonder 376. For example, a lower surface of the dust bag cartridge 374 may be in contact with an upper surface of the bonder 376. At this instance, the sealer configured to block leakage of the debris may be provided on the lower surface of the dust bag cartridge 374 and/or the upper surface of the bonder 376. With this configuration, in a state in which the dust bag 372 is bonded and separated, the debris in the flow path part 380 may be prevented from being leaked through a portion between the dust bag cartridge 374 and the bonder 376.

[0212] The dust collecting part 370 may further include a pre-filter 379. The pre-filter 379 may be disposed between the dust separating part 371 and a second suction flow path 382. Alternatively, the pre-filter 379 may be disposed on the second suction flow path 382. The pre-filter 379 may may separate and filter debris from air which has passed through the dust separating part 371 and flows to the second suction flow path 382.

[0213] With this configuration, there is an effect that fine debris can be prevented from being introduced into the dust collecting motor 391.

[0214] The pre-filter 379 may be detachably coupled to an inside of the second suction flow path 382. For example, a pre-filter insertion portion 379a is provided on a front end of the second suction flow path 382, and the pre-filter 379 may be inserted into or withdrawn from the pre-filter insertion portion 379a (Refer to FIG. 13). At this time, a plurality of holes, through which air which has passed through the pre-filter 379 can flow to the second suction flow path, may be formed in the pre-filter insertion portion 379a.

[0215] The dust collecting part 370 may further include the bonder 376.

[0216] The bonder 376 may be disposed in the housing 310. For example, the bonder 376 may be fixedly coupled to the housing 310.

[0217] The bonder 376 may be disposed below the dust bag cartridge 374. For example, the upper surface of the bonder 376 may be in contact with the lower surface of the dust bag cartridge 374. With this configuration, the bonder 376 may guide insertion and removal of the dust bag cartridge 374. Meanwhile, the sealer may be provided between the upper surface of the bonder 376 and the lower surface of the dust bag cartridge 374 so as to block leakage of the debris.

[0218] The bonder 376 may be disposed at an upper side of the dust bag supporting portion 373. For example, a lower surface of the bonder 376 may be in contact with an upper surface of the dust bag supporting portion 373. At this time, the sealer may be provided between the lower surface of the bonder 376 and the upper surface of the dust bag supporting portion 373, thereby preventing leakage of the debris.

[0219] The bonder 376 may cut and bond an upper area of the dust bag 372 in which dust is collected. In more detail, the bonder 376 may collect the dust bag 372 into a central area and bond an upper area of the dust bag 372 with a heat wire. For example, the bonder 376 may include a first bonding member (not illustrated) and a second bonding member (not illustrated). The first bonding member (not illustrated) may move in a first direction through a first bonding operating portion and the second bonding member (not illustrated) may move in a second direction through a second bonding operating portion perpendicular to the first direction.

[0220] With this configuration, it is possible to collect dust collected from the outside into an inside of a vinyl bag, and may bond the vinyl bag automatically. Therefore, convenience of the user may be improved, because the user need not tie up the dust bag in which dust is collected.

[0221] Meanwhile, the dust collecting part 370 may further include a dust amount sensor.

[0222] The dust amount sensor may measure an amount of the dust inside the dust bag. In a possible embodiment, when the amount of dust measured by the dust amount sensor reaches a predetermined amount, the bonder 376 automatically operates to cut and bond the dust bag 372.

[0223] The cleaner station 300 may include the flow path part 380.

[0224] The flow path part 380 may connect the dust collecting part 370 and the dust collecting motor 391 to each other. The flow path part 380 may include the first suction flow path 381 and the second suction flow path 382.

[0225] The first suction flow path 381 may connect the dust bin 220 and the dust separating part 371 to each other. The first suction flow path 381 may be disposed at a rear side of the coupling part 321. The first suction flow path 381 may mean a space formed so as to allow air to flow between the dust bin 220 of the cleaner 200 and the dust separating part 371. For example, the first suction flow path 381 may be a space surrounded by a structure. For example, the first suction flow path 381 may be an internal space of a hollow pipe.

[0226] When the cleaner 200 is coupled to the first suction flow path 381 and the dust passage hole 321a is opened, the first suction flow path 381 may include a first area 381a communicated with an internal space of the dust bin 220, and a second area 381b configured to communicate the first area 381a and the dust separating part 371 to each other. (Refer to FIG. 8)

[0227] At this instance, a direction in which the first area 381a is formed may be disposed to be substantially parallel to an axial direction (a longitudinal direction) of the dust bin 220. In addition, a direction in which the second area 381b is formed may be disposed to be side by side with a longitudinal axis C of the housing 310. At this instance, the first area 381a may be formed at a certain angle with the second area 381b. With this configuration, it is possible to minimize reduction of the suction force of the dust collecting motor 391 in the first suction flow path 381 and the second suction flow path 382.

[0228] When the dust collecting motor 391 is operated, dust inside the dust bin 220 of the cleaner 200 may flow to the dust separating part 371.

[0229] The second suction flow path 382 may connect the dust separating part 371 and the dust suction module 390 to each other. That is, air which is separated from dust while passing through the dust separating part 371 may be guided to the dust collecting motor 391 through the second suction flow path 382.

[0230] The second suction flow path 382 may mean a space between the dust separating part 371 and the dust suction module 390, in which air can flow. The second suction flow path 382 may be formed to be surrounded by a structure. Some area of the second suction flow path 382 may be formed by the dust bag supporting part 373. The second suction flow path 382 formed by the dust bag supporting part 373 may be disposed on a lateral surface of the dust bag supporting part 373.

[0231] With this configuration, it is possible to bypass a moving path of some of sucked air which flows in the second suction flow path 373, only by forming an air hole 373b in the dust bag supporting part 373 such that the air hole 373b penetrates the dust bag supporting part 373, which will be described below.

[0232] In the present disclosure, a moving path of the sucked air which flows toward the dust suction motor 391 only through the flow path part 380 is defined as a main suction path MP, and a moving path of the sucked air which passes through insides of the flow path part 380 and the dust bag supporting part 373 and flows to the dust suction motor 391 is defined as bypass suction paths BP1 and BP2. This will be described below.

[0233] With this configuration, there is an effect of becoming able to expand the dust bag by operating the dust collecting motor 391 and to maintain the expanded shape.

[0234] The cleaner station 300 may include the dust suction module 390.

[0235] The dust suction module 390 may include the dust collecting motor 391. The dust suction module 390 may disposed at a lower side of the dust collecting part 370. The dust collecting motor 391 may generate a suction force in the flow path part 380. With this configuration, a suction force capable of sucking in dust is provided in the inside of the dust bin 220 of the cleaner 200.

[0236] The dust collecting motor 391 may generate the suction force by a rotation. For example, the dust collecting motor 391 may be formed in a shape similar to a cylinder, and may generate the suction force while rotating about a rotary axis. At this time, a direction of the rotary axis of the dust collecting motor 391 may be disposed perpendicular to the ground surface.

[0237] FIG. 14 is a separate perspective view of the dust separating part and the dust bag supporting part in the cleaner station according to an embodiment of the present disclosure.

[0238] Referring to FIG. 14, the dust separating part 371 may provide at least one or more cyclone part 371a configured to separate dust by a cyclonic flow. Therefore, dust introduced through the first suction flow path 381 spirally flows along an internal circumferential surface of the dust separating part 371. Therefore, a cyclonic flow may be generated in the internal space of the dust separating part 371.

[0239] Meanwhile, in the present embodiment, the cyclone part 371a may include a mesh net formed in a cylindrical shape. An axial direction of the mesh net may be disposed to be side by side to the ground surface. With this configuration, when the cyclone part 371a is pulled out from the lateral surface of the cleaner station 300, the cyclone part 371a may be separated from the dust collecting part 370. Therefore, according to the embodiment, the user may easily separate the cyclone part

371a, and may wash the mesh net.

[0240] In addition, the dust separating part 371 may include a dust passage pipe 371b configured to guide dust separated in the cyclone part 371a to the dust bag 372. The dust passage pipe 371b may be formed from one side of the cyclone part 371a in an axial direction toward a lower side. In addition, the dust passage pipe 371b may communicate internal spaces of the cyclone part 371a and the dust bag supporting part 373 because both ends thereof in the axial direction are opened.

[0241] The dust passage pipe 371b may further include a second cyclone configured to secondarily separate dust from air discharged from the cyclone part 371a. At this instance, the second cyclone may be disposed inside the cyclone part 371a so as to minimize a size of the dust separating part 371. The second cyclone may include a plurality of cyclone bodies disposed in parallel.

[0242] An upper side of the dust bag supporting part 373 is opened and is communicated with the cyclone part 371a, dust separated from air by the cyclonic flow falls to the dust bag 372. (a path denoted by a dashed-dotted line in FIG. 14) At this instance, the sucked air passes through the dust separating part 373 through the first suction flow path 381 by the suction force and moves to the second suction flow path 382. (a path denoted by a solid line in FIG. 14)

[0243] FIG. 15 is a perspective view of the dust bag supporting part in the cleaner station according to the embodiment of the present disclosure, and FIG. 16 is a cross-sectional perspective view for describing an internal structure of the dust bag supporting part in the cleaner station according to the embodiment of the present disclosure.

[0244] Referring to FIGS. 15 and 16, the dust supporting part 373 may provide a dust bag accommodating space configured to accommodate the dust bag 372 inside thereof in the embodiment of the present disclosure. The upper side of the dust bag supporting part 373 is opened, and the dust bag supporting part 373 is disposed at a lower side than the dust separating part 371, thereby dust separated in the dust separating part 371 may fall to the dust bag accommodating space of the dust bag supporting part 373.

[0245] The dust bag supporting part 373 may include a supporting part main body 373a, the air hole 373b, and a supporting part outer wall 373c.

[0246] The supporting part outer wall 373c forms an external appearance of the dust bag supporting part 373. For example, the supporting part outer wall 373c may have a hexahedral shape generally. Some frontal area of the supporting part outer wall 373c may be opened to withdraw the dust bag 372. Some area of an upper surface of the supporting part outer wall 373c or the entire upper surface thereof may be opened in a direction facing the dust separating part 371.

[0247] The supporting part main body 373a is disposed inside the supporting part outer wall 373c. The supporting part main body 373a forms a space between the supporting part main body 373a and the supporting part outer wall 373c. A space formed outside the supporting part main body 373a may configure some of the second suction flow path 382. A space formed inside the supporting part main body 373a may be defined as the dust bag accommodating space which has been described above.

[0248] In more detail, the supporting part main body 373a may include a main body side wall 373aa and a main body bottom wall 373ab. The main body side wall 373aa is disposed to be side by side with the longitudinal axis C of the housing 310, and the main body bottom wall 373ab is connected to the main body side wall 373aa and is disposed perpendicular to the longitudinal axis C of the housing 310.

[0249] Like the embodiment illustrated in FIG. 16, when the main body side wall 373aa is provided on only one surface, the supporting part main body 373a and the supporting part outer wall 373c may together form an external appearance of the dust bag accommodating space.

[0250] Alternatively, in another possible embodiment, the main body side wall 373aa may be provided in all directions which are forward and rearward directions and left and right directions, the supporting part main body 373a may alone form the external appearance of the dust bag accommodating space. At this instance, some area of the main body side wall 373aa disposed at a front may be opened so as to withdraw the dust bag 372 to the outside of the housing 310.

[0251] The air hole 373b is formed in the supporting part main body 373a. The air hole 373b is formed to penetrate the supporting part main body 373a. With this configuration, the dust bag accommodating space and the second suction flow path 382 are communicated with each other, and when the dust collecting motor is operated, some of the sucked air flowing to the second suction flow path 382 may be introduced into the dust bag accommodating space.

[0252] The air hole 373b may be formed in each of the main body side wall 373aa and the main body bottom wall 373ab. The air hole 373b may be formed in plural number. As the suction force of the dust collecting motor 391 is applied downward, the sucked air from the second suction flow path 382 passes through the air hole 373b of the main body side wall 373aa, is introduced into the dust bag accommodating space, and then, passes through the air hole 373b of the main body bottom wall 373ab and evades therefrom.

[0253] That is, the air hole 373b formed in the supporting part main body 373a serves to bypass a flow of the sucked air flowing in the flow path part 380, from the main suction path MP.

[0254] Here, the main suction path MP is a moving path of the sucked air flowing from the second suction flow path 382 to the dust collecting motor 391 directly. In the present embodiment, a quantity of the air holes 373b formed in the main body side wall 373aa is smaller than a quantity of the air holes 383b formed in the main body

bottom wall 373ab. Therefore, an amount of air evading from the dust bag accommodating space to the second suction flow path 382 is greater than an amount of air introduced into the dust bag accommodating space from the second suction flow path 382.

[0255] By the above-described configuration, a negative pressure expanding the dust bag 372 is formed in the dust bag accommodating space when the dust collecting motor 391 is operated. That is, the dust bag automatically expands by the operation of the dust collecting motor, without requiring the user to manually unfold the dust bag, therefore, convenience of the user is improved.

[0256] The cleaner station 300 according to the embodiment of the present disclosure may further include a partition portion 375 disposed inside the dust bag supporting part 373. The partition portion 375 is configured to separate and partition the dust bag accommodating space into a first space S1 and a second space S2.

[0257] In more detail, the partition portion 375 includes a partition portion side wall 375a which is spaced apart from the main body side wall 373aa at a certain interval toward an inside of the dust bag accommodating space, and is disposed to be side by side with the main body side wall 373aa. The partition portion 375 further includes a partition portion bottom wall 375b which is spaced apart from the main body bottom wall 373ab at a certain interval toward an inside of the dust bag accommodating space, and is disposed to be side by side with the main body bottom wall 373ab. The partition portion side wall 375a and the partition portion bottom wall 375b are connected to each other. With this configuration, with the partition portion 375 interposed therebetween, the dust bag accommodating space is separated and partitioned into the first space S1 which is an internal space, and the second space S2 which is an external space.

[0258] The partition portion 375 includes an air hole 375c configured to communicate the second space S2 and the first space S1. The air hole 375c is formed to penetrate the partition portion side wall 375a. The air hole 375c is formed to penetrate partition portion bottom wall 375b. The air hole 375c of the partition portion 375 may be disposed at a position corresponding to the air hole 375b of the supporting part main body 373a. A quantity of the air hole 375c of the partition portion 375 may correspond to a quantity of the air hole 375b.

[0259] FIG. 17 is a cross-sectional perspective view illustrating a moving path of sucked air in the dust bag supporting part in the cleaner station according to the embodiment of the present disclosure.

[0260] When the dust collecting motor 391 is operated, a negative pressure is formed in the first space S1 and the second space S2 simultaneously by a flow of the air through the air holes 373b and 375c. Some of the sucked air of the second suction flow path 382 passes through the second space S2 and the first space S1 and may be guided to the dust collecting motor 391. (BP1, a path denoted by a dotted line in FIG. 17) Some of the sucked air of the second suction flow path 382 passes through the second space S2 only and may be guided to the dust collecting motor 391. (BP2, a path denoted by a dashed-dotted line in FIG. 14)

[0261] The moving paths are moving paths for bypassing the main suction path MP (a path denoted by a solid line in FIG. 17), and therefore, is defined as the bypass suction path.

[0262] At this instance, a bypass suction path connected to the second suction flow path 382, the second space S2, the first space S1, and the dust collecting motor 391 may be defined as a first bypass suction path BP1. Unlike this, a bypass suction path connected to the second suction flow path 382, the second space S2, and the dust collecting motor 391 may be defined as a second bypass suction path BP2.

[0263] That is, the partition portion 375 serves to partition the bypass suction paths through which the sucked air flows when the dust collecting motor 391 is operated. By doing so, a backflow phenomenon where the expanded dust bag 372 runs backward to the dust separating part 371 may be prevented. Before describing this, a backflow phenomenon where the dust bag runs backward when the partition portion 375 is not provided will be described below.

[0264] FIGS. 18 to 20 are schematic views for describing a backflow phenomenon of the dust bag when the partition portion is not disposed in the dust bag supporting part.

[0265] As illustrated in FIG. 18, a negative pressure is formed in the dust bag accommodating space, as the sucked air moves to the bypass suction path BP through the air hole 373b formed in the supporting part main body 373a. The dust bag 372 expands by a negative pressure, and the expanded dust bag 372 is supported by an internal surface of the supporting part main body 373a. When the dust bag 372 expands to the fullest and is attached to the internal surface of the supporting part main body 373a as illustrated in FIG. 19, the air hole 373b of the supporting part main body 373a is blocked by the dust bag 372, and entrance and exit of the air is blocked.

[0266] That is, an airflow through the bypass suction path BP is blocked and the sucked air flows only through the main suction path MP, therefore, the entire flow rate toward the dust collecting motor 391 is reduced. The reduction of the flow rate toward the dust collecting motor 391 means a relative increase of the flow rate evading from the dust separating part 371. In addition, when the bypass suction path BP is blocked due to blockage of the air hole 373b, the force expanding the dust bag 372 weakens.

[0267] As illustrated in FIG. 20, the backflow phenomenon of the dust bag by which the dust bag 372 partially runs upward occurs due to the above-described reasons. This may lead to performance deterioration of the dust separating part 371. Or, when the dust bag 372 running backward is stuck by parts such as the dust bag cartridge 374, the bonder 376, and the like, it may cause failure of the dust bag cartridge 374, the bonder 376, and the like.

[0268] Hereinafter, referring back to FIGS. 16 and 17, a flow of the sucked air when the partition portion 375 is disposed as in the present embodiment will be described.

[0269] As the partition portion 375 is spaced apart at a certain interval toward an internal side of the dust bag accommodating space from the supporting part main body 373a, a clearance (the second space S2) through which air can flow is formed between the partition portion 375 and the supporting part main body 373a.

[0270] When a direction of the second space S2 is defined to be one side and a direction of the first space S1 is defined to be the other side based on the partition portion 375, the partition portion 375 supports an external appearance of the expanded dust bag 372 on the other side so that the airflow in the second space S2 disposed on one side is not interrupted.

[0271] In other words, the expansion of the dust bag 372 is blocked by the partition portion 375. The dust bag 372 is supported while expanding along the other side surface of the partition portion 375. When explaining from the other viewpoint, the dust bag 372 expands along a form of the partition portion 375 disposed.

[0272] By the expansion of the dust bag 372, entrance and exit to/from the air hole 375c of the partition portion 375 may be blocked. Therefore, according to a degree of expansion of the dust bag 372, the airflow through the first bypass suction flow path BP1 is maintained or blocked.

[0273] At this time, because the dust bag 372 is supported by the partition portion 375, the airflow through the air hole 373b formed in the supporting part main body 373a is not blocked. Therefore, the airflow through the second bypass suction path BP2 is constantly maintained regardless of the degree of expansion of the dust bag 372.

[0274] FIGS. 21 and 22 are schematic view for describing a principle by which the backflow phenomenon of the dust bag is prevented when the partition portion is disposed in the dust bag supporting part.

[0275] Referring to FIGS. 21 and 22, even if the dust bag 372 expands to the fullest and the air hole 375c of the partition portion 375 is blocked, the airflow through the second bypass suction path BP2 is maintained, therefore, no great loss of the flow rate occurs as illustrated in FIGS. 19 and 20.

[0276] Therefore, a flow rate guided to the dust collecting motor 391 is still greater than a flow rate evading from the dust separating part 371. That means the force pulling the dust bag 372 upward is greater than the force pulling the dust bag 372 downward, and thus, the backflow phenomenon of the dust bag 372 as illustrated in FIG. 20 can be restrained.

[0277] Accordingly, there is an effect of preventing failures of the dust bag cartridge 374 or the bonder 376 caused by the dust bag 372 stuck by parts such as the dust bag cartridge 374 or the bonder 376.

[0278] While the present disclosure has been described with reference to the specific embodiments, the specific embodiments are only for specifically explaining the present disclosure, and the present disclosure is not limited to the specific embodiments. It is apparent that the present disclosure may be modified or altered by those skilled in the art without departing from the technical spirit of the present disclosure. All the simple modifications or alterations to the present disclosure fall within the scope of the present disclosure, and the specific protection scope of the present disclosure will be defined by the appended claims.

Claims

1. A cleaner station, comprising:

a housing coupled to a dust bin;
a dust collecting motor accommodated in the housing and configured to generate a suction force sucking in dust inside the dust bin;
a dust separating part accommodated in the housing, disposed above the dust collecting motor, and configured to separate dust contained in air sucked in by the dust collecting motor;
a flow path part comprising a first suction flow path connecting the dust bin and the dust separating part and a second suction flow path configured to guide air passed through the dust separating part to the dust collecting motor;
a dust bag supporting part disposed below the dust separating part and providing a dust bag accommodating space so as to accommodate a dust bag storing dust separated in the dust separating part; and
a partition portion disposed in the dust bag supporting part and configured to partition the dust bag accommodating space into a first space and a second space.

2. The cleaner station of claim 1,
wherein the dust bag supporting part comprises:

a supporting part main body forming an external appearance of the dust bag accommodating space; and
an air hole formed in the supporting part main body and configured to communicate the second suction flow path and the dust bag accommodating space with each other.

3. The cleaner station of claim 1,
wherein the partition portion comprises an air hole configured to communicate the second space and the first space with each other.

4. The cleaner station of claim 1,
wherein at least some of air sucked by the dust collecting motor flows through a bypass suction path

connected to the second suction flow path, the second space, and the dust collecting motor.

5. The cleaner station of claim 1,
wherein at least some of air sucked by the dust collecting motor flows through a bypass suction path connected to the second suction flow path, the second space, the first space and the dust collecting motor.

6. The cleaner station of claim 1,
wherein the dust bag is formed of an impermeable material.

7. The cleaner station of claim 1,
wherein when the dust collecting motor is driven, the dust bag expands by a negative pressure formed in the dust bag accommodating space.

8. The cleaner station of claim 7,
wherein in order not to interrupt an airflow of the second space disposed on one side, the partition portion is configured to support an external appearance of the expanded dust bag on another side.

9. The cleaner station of claim 1, further comprising:
a pre-filter configured to filter debris from air which has passed through the dust separating part.

10. A cleaner station, comprising:

a housing coupled to a dust bin;
a dust collecting motor accommodated in the housing and configured to generate a suction force sucking in dust inside the dust bin;
a dust separating part accommodated in the housing, disposed above the dust collecting motor, and configured to separate dust contained in air sucked in by the dust collecting motor;
a flow path part comprising a first suction flow path connecting the dust bin and the dust separating part and a second suction flow path configured to guide air passed through the dust separating part to the dust collecting motor;
a dust bag supporting part disposed below the dust separating part and providing a dust bag accommodating space so as to accommodate a dust bag storing dust separated in the dust separating part; and
a partition portion disposed in the dust bag supporting part and configured to partition the dust bag accommodating space into a first space and a second space,
wherein when the dust collecting motor is driven,
a main suction flow path through which sucked air flows from the second suction flow path directly to the dust collecting motor;
a first bypass flow path through which sucked air flows to the dust collecting motor through the second suction flow path, the second space, and the first space; and
a second bypass flow path through which sucked air flows to the dust collecting motor through the second suction flow path, and the second space is formed.

11. The cleaner station of claim 10,
wherein when the dust collecting motor is driven, the dust bag expands by a negative pressure formed in the dust bag accommodating space.

12. The cleaner station of claim 11,

wherein an airflow of the first bypass suction flow path is maintained or blocked according to a degree of expansion of the dust bag, and
wherein an airflow of the second bypass suction flow path is constantly maintained regardless of the degree of expansion of the dust bag.

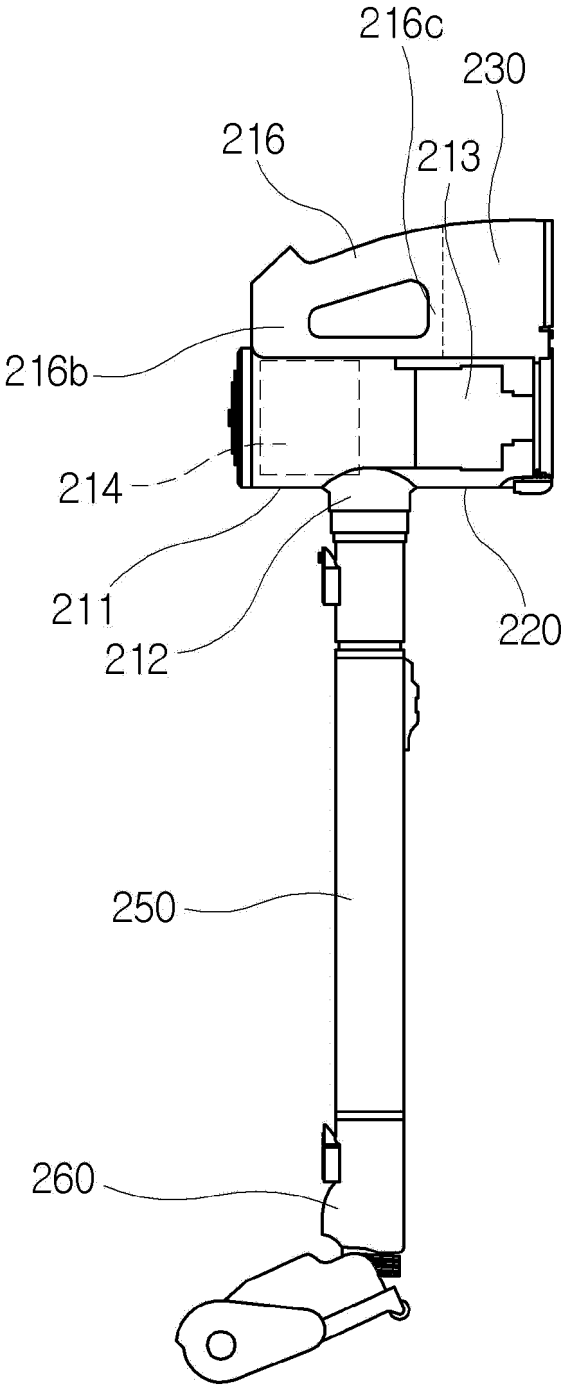
13. The cleaner station of claim 10,
wherein the dust bag supporting part comprises:

a supporting part main body forming a partial external appearance of the dust bag accommodating space; and
an air hole formed in the supporting part main body and configured to communicate the second suction flow path and the dust bag accommodating space with each other.

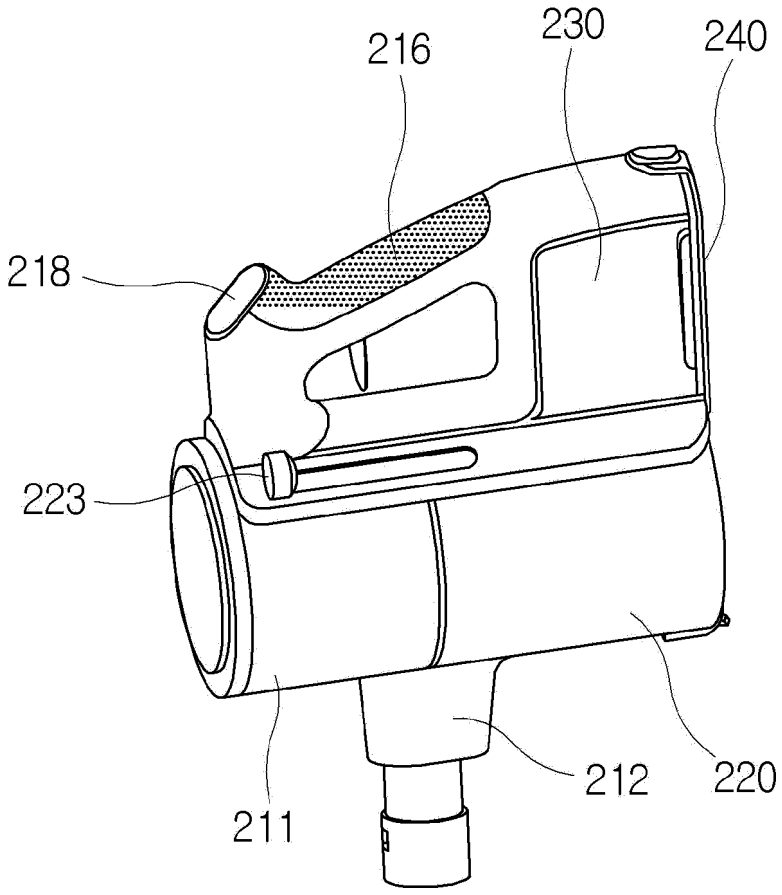
14. The cleaner station of claim 10,
wherein the partition portion comprises an air hole configured to communicate the second space and the first space with each other.

15. The cleaner station of claim 10,
wherein the dust bag is formed of an impermeable material.

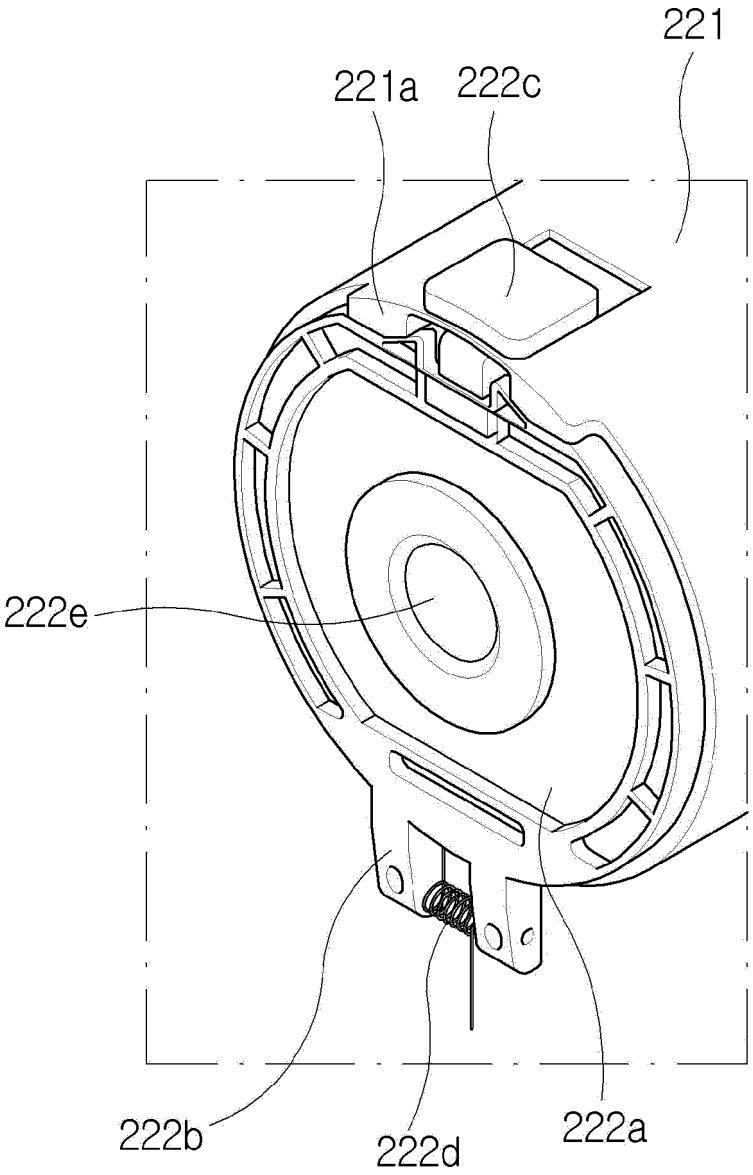
[FIG. 1]



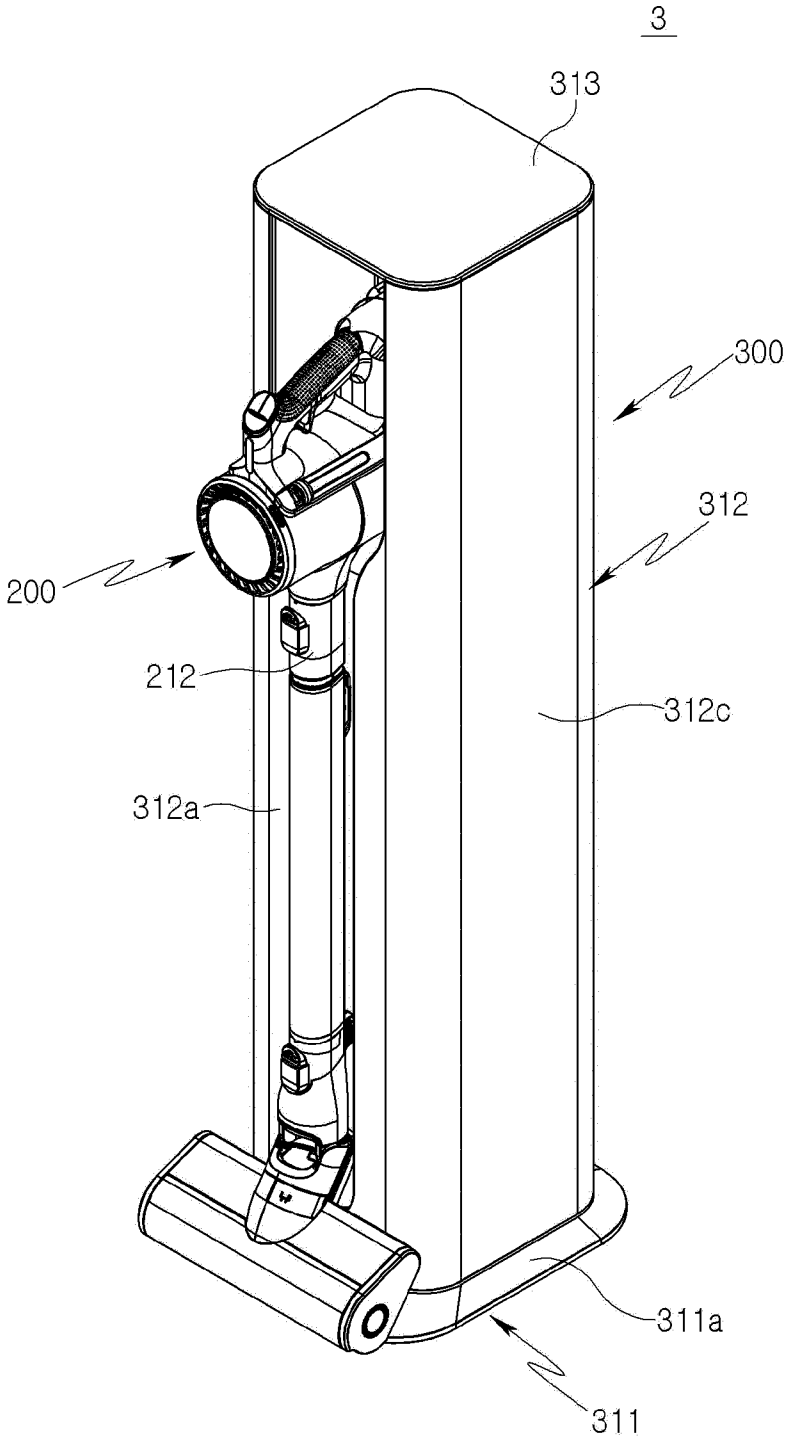
[FIG. 2]



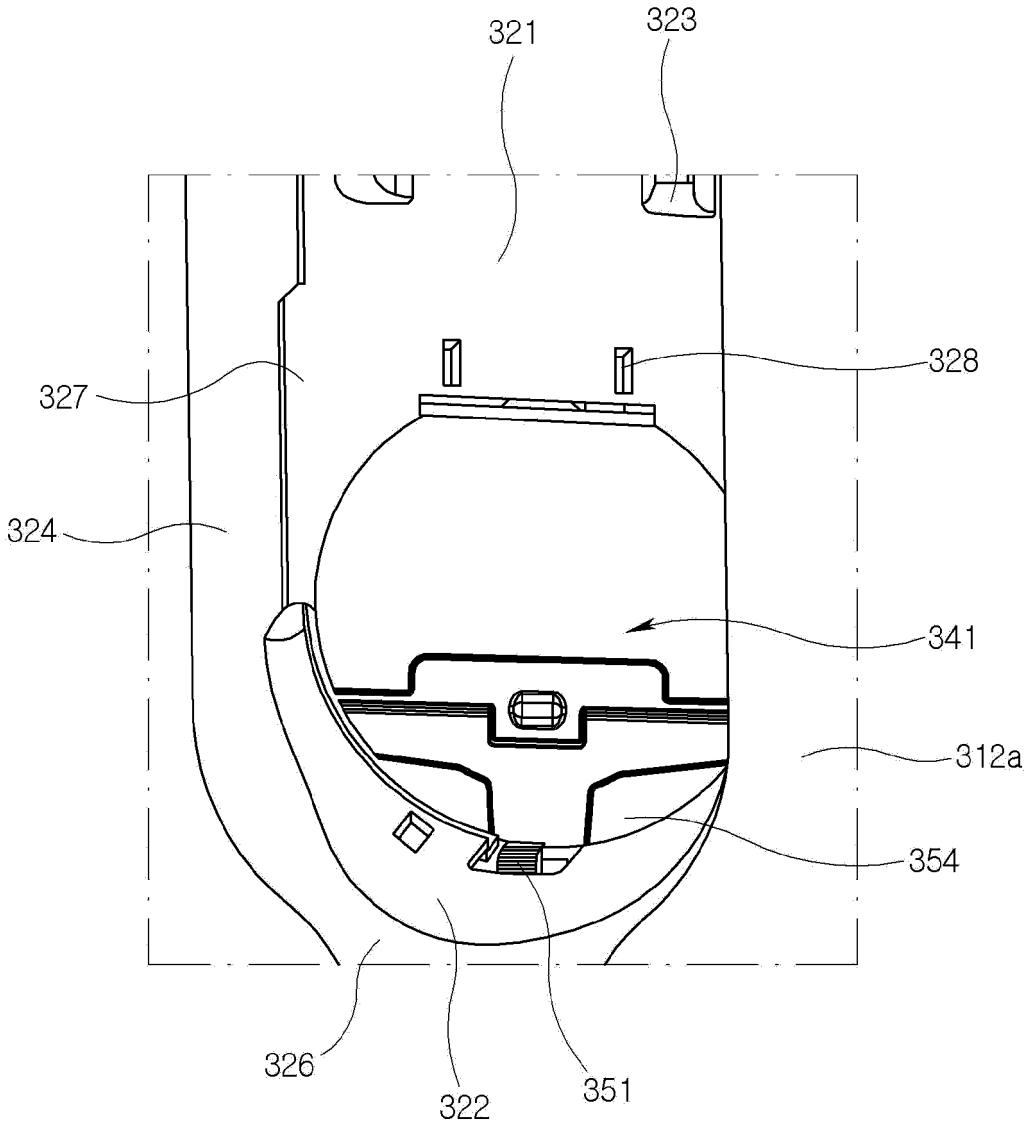
[FIG. 3]



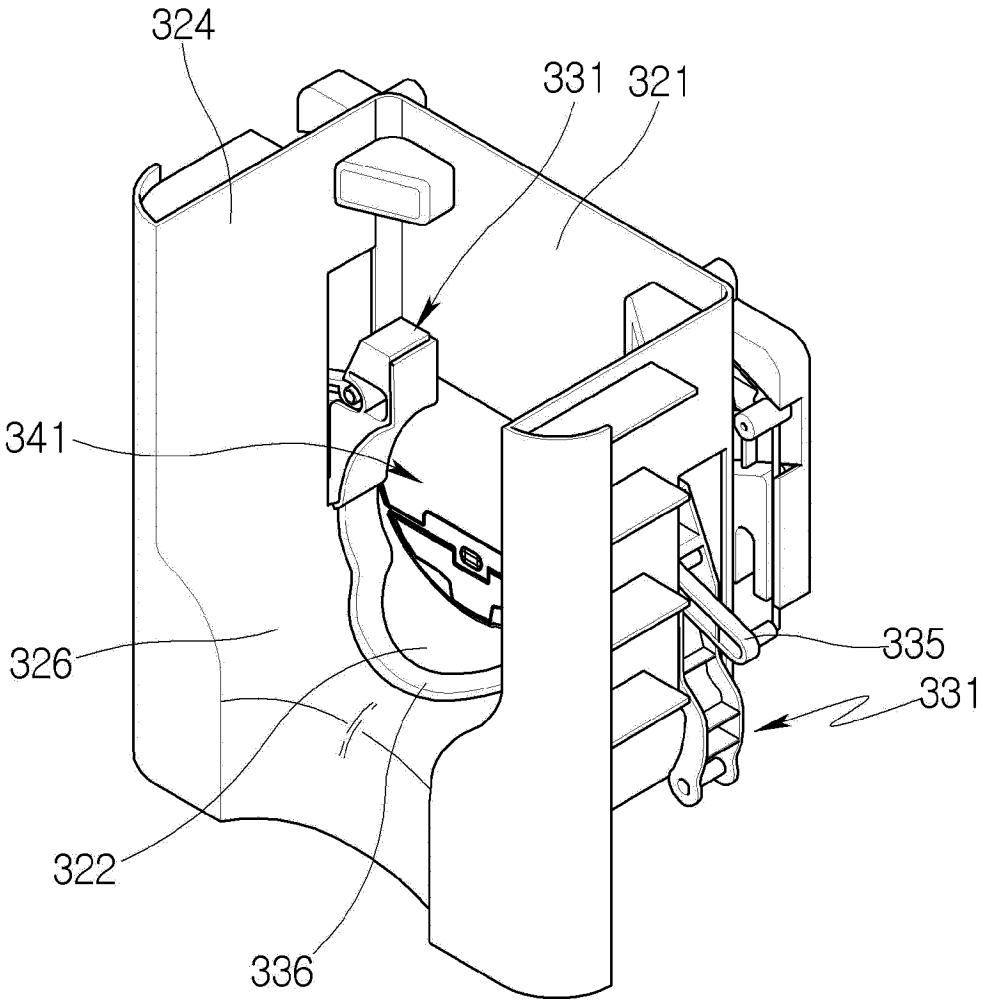
[FIG. 4]



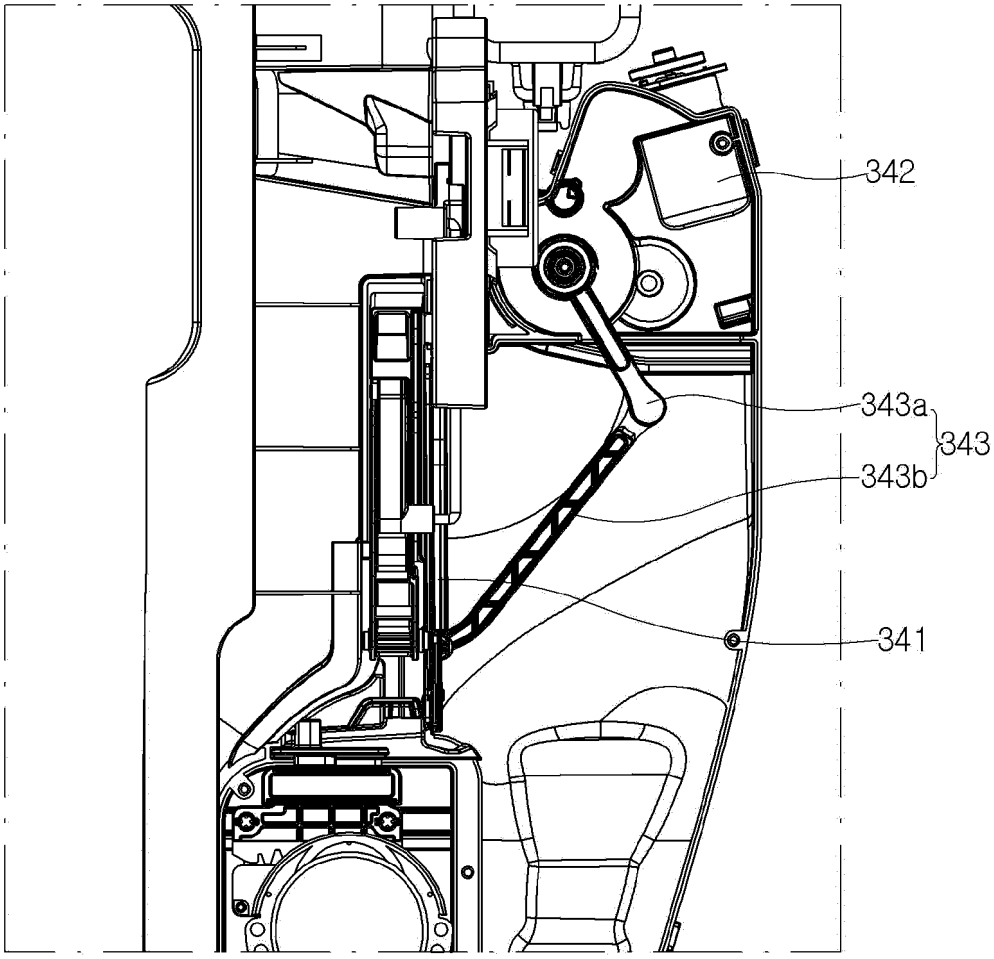
[FIG. 5]



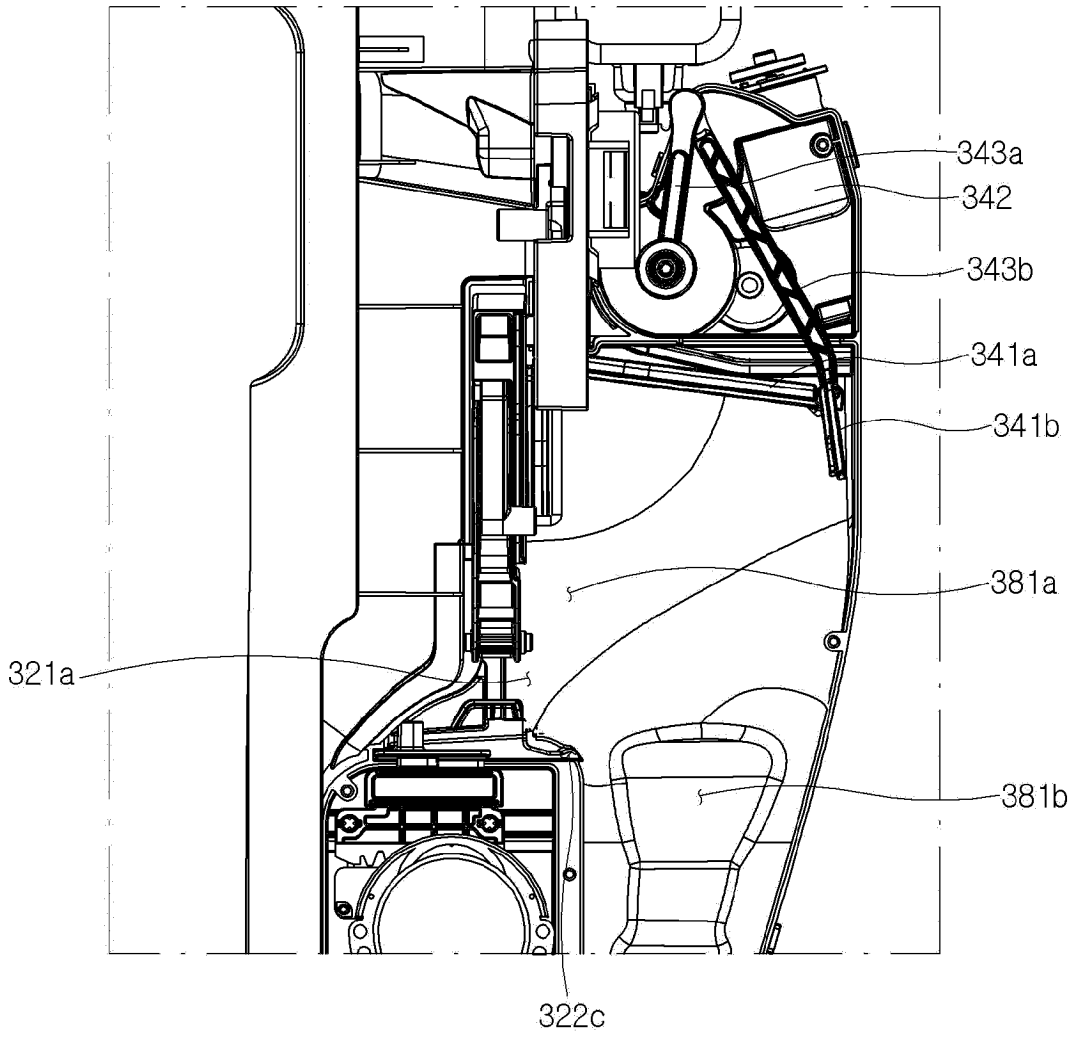
[FIG. 6]



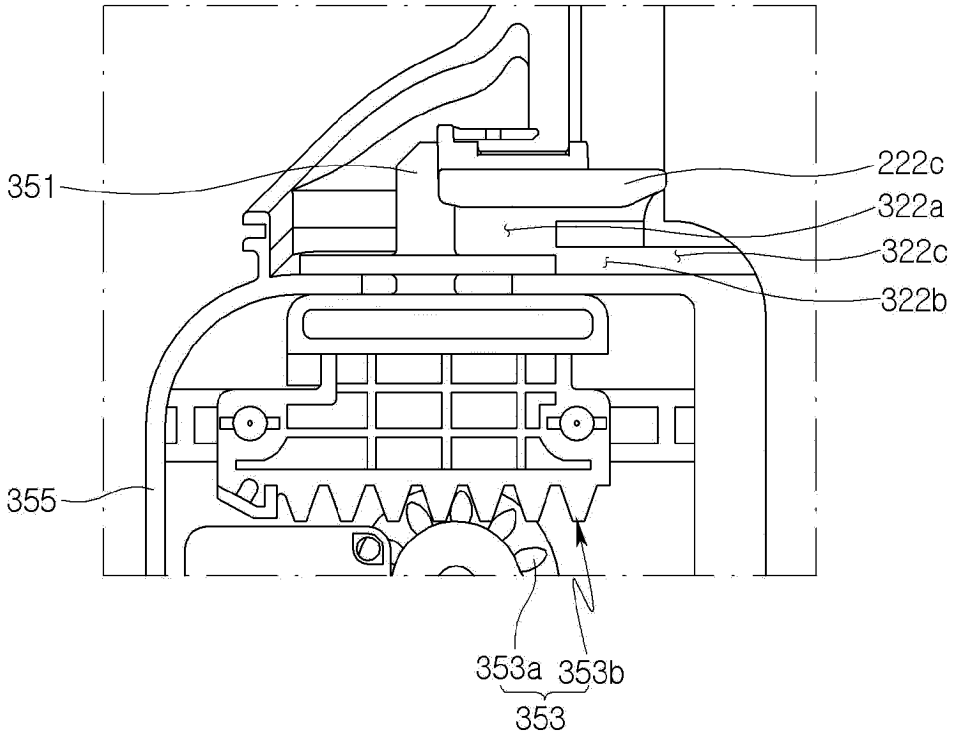
[FIG. 7]



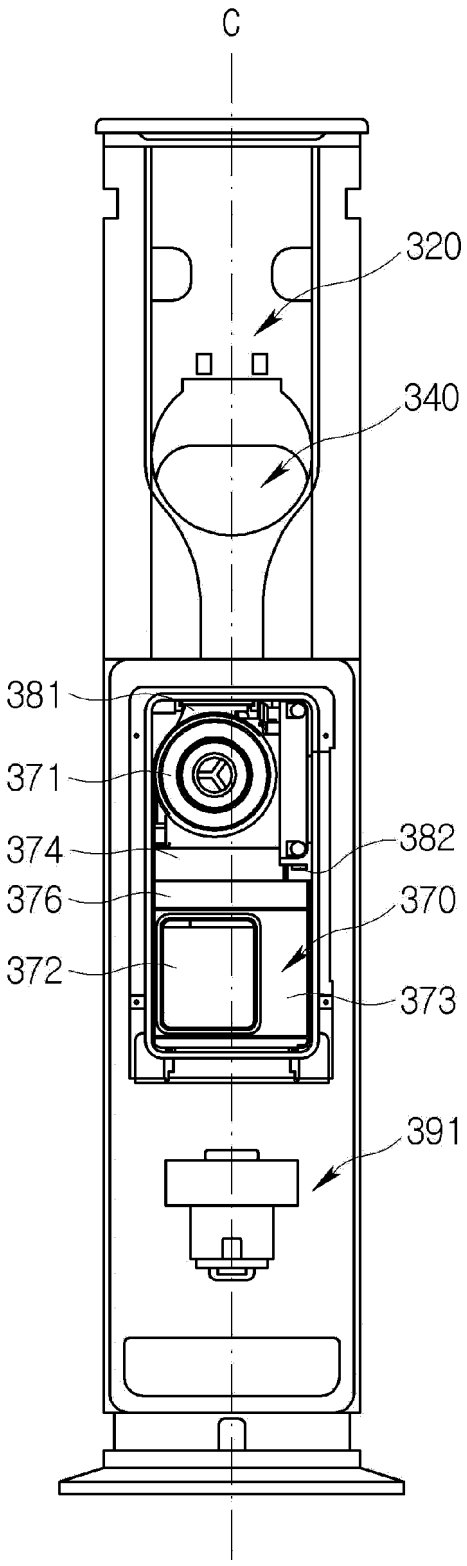
[FIG. 8]



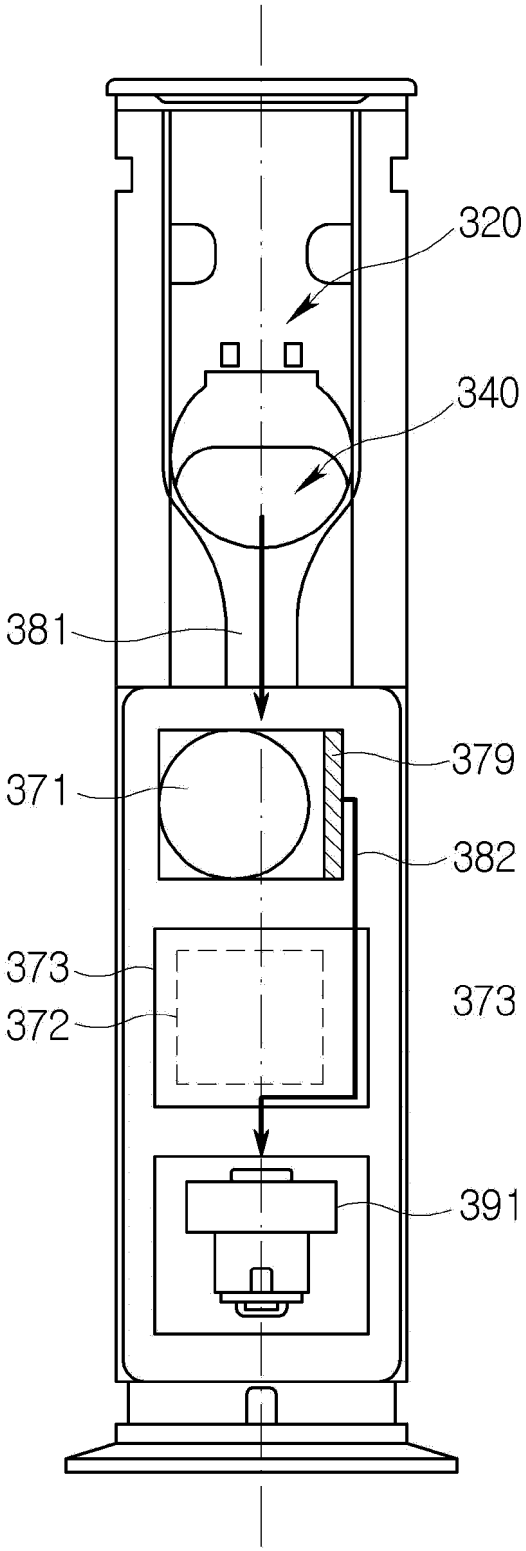
[FIG. 9]



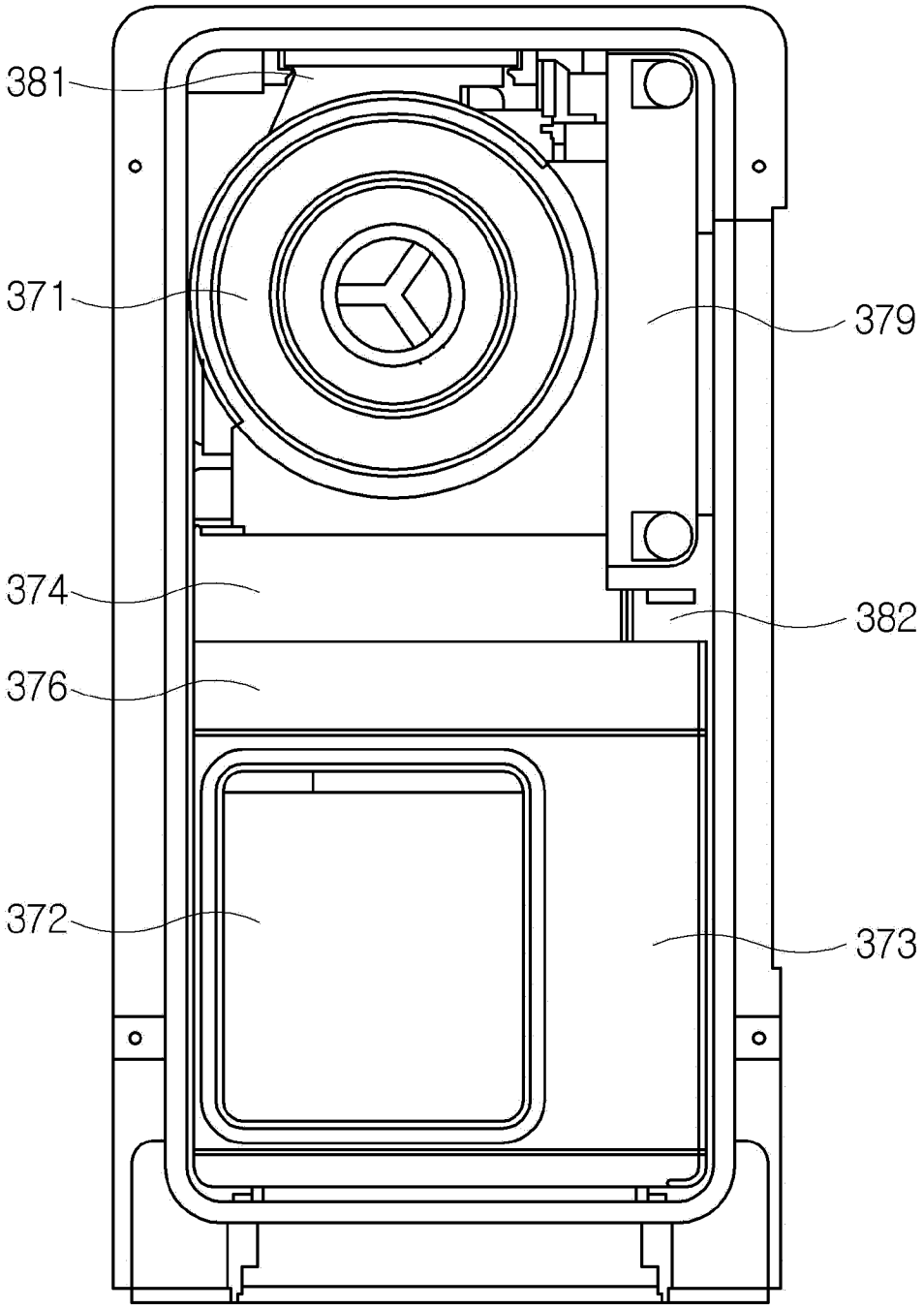
[FIG. 10]



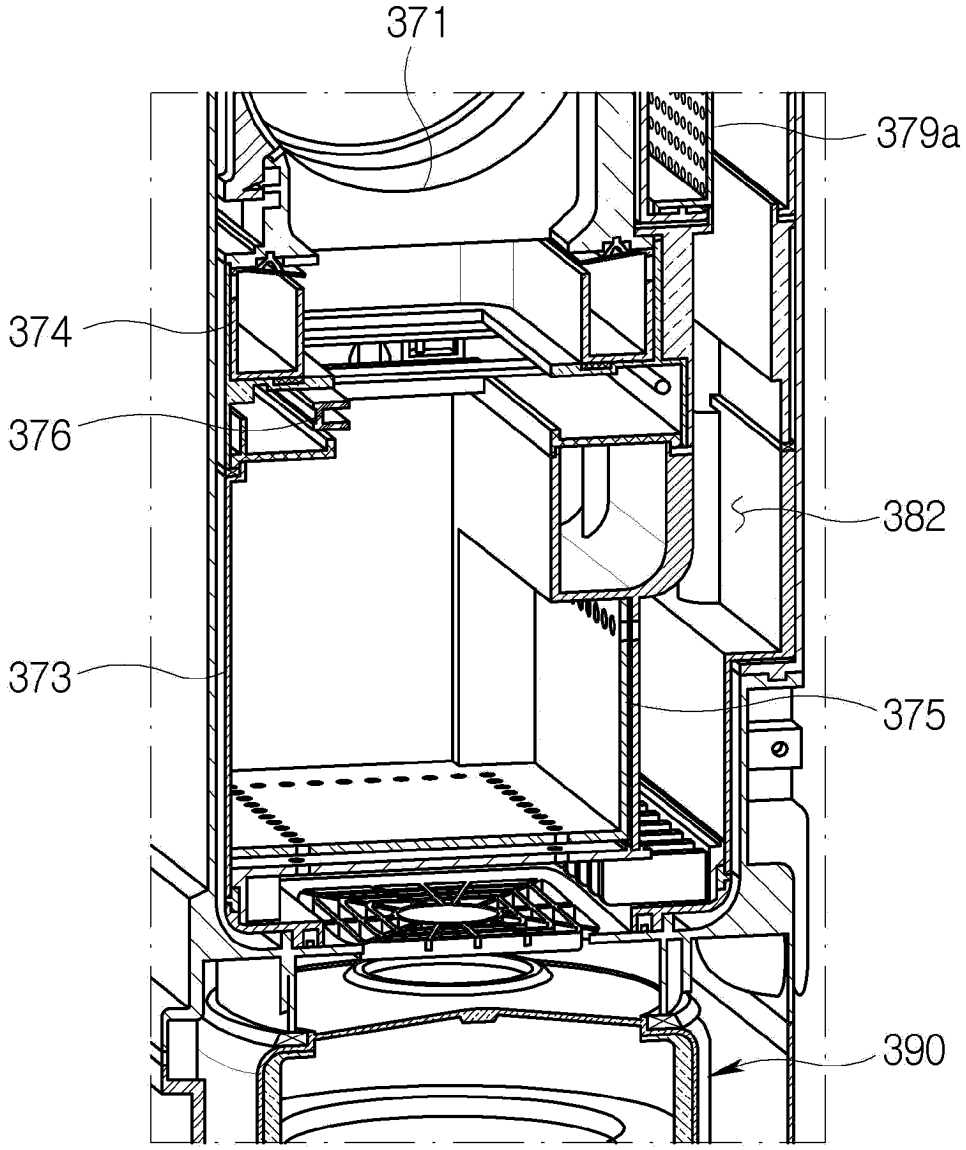
[FIG. 11]



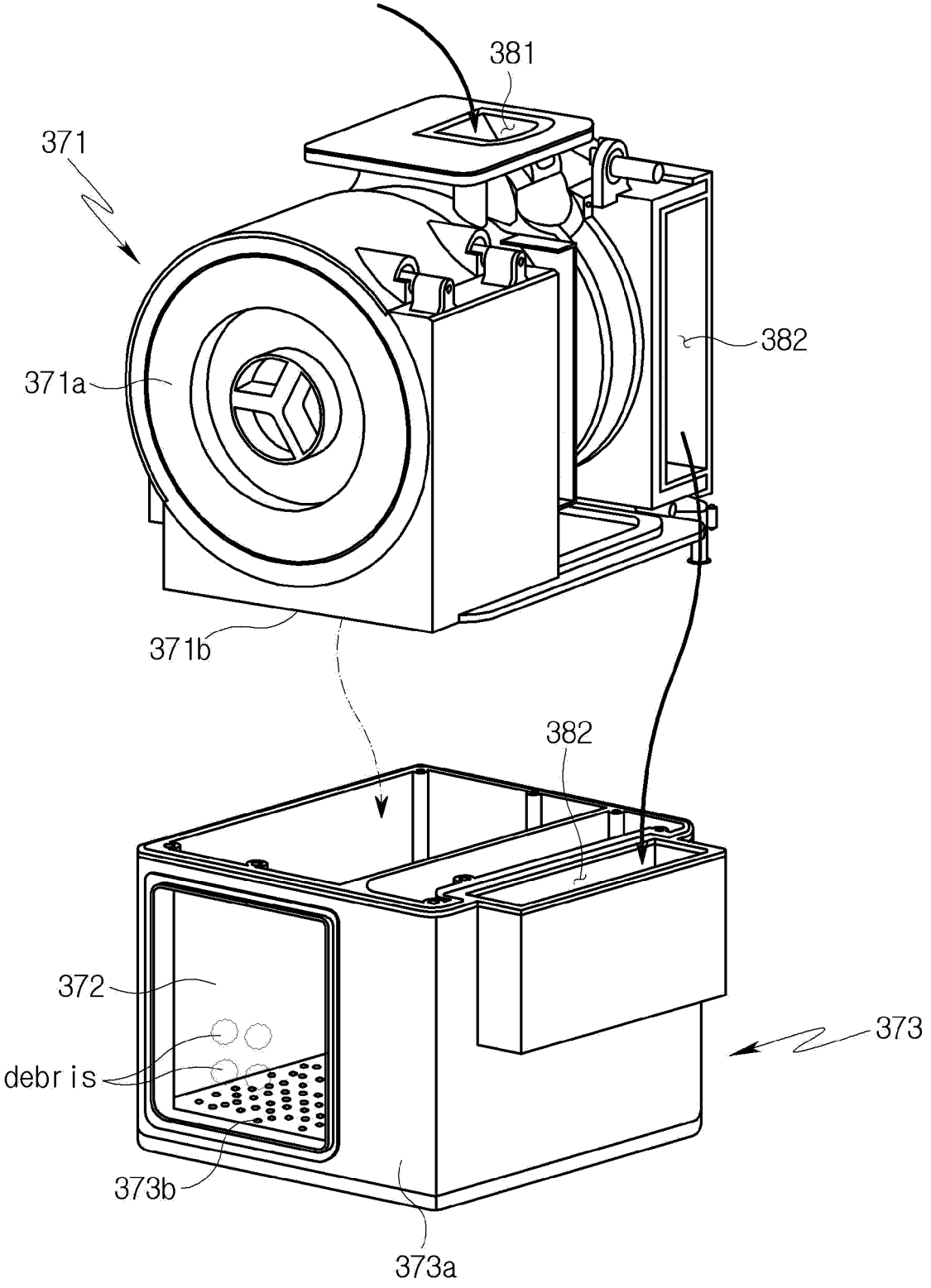
[FIG. 12]



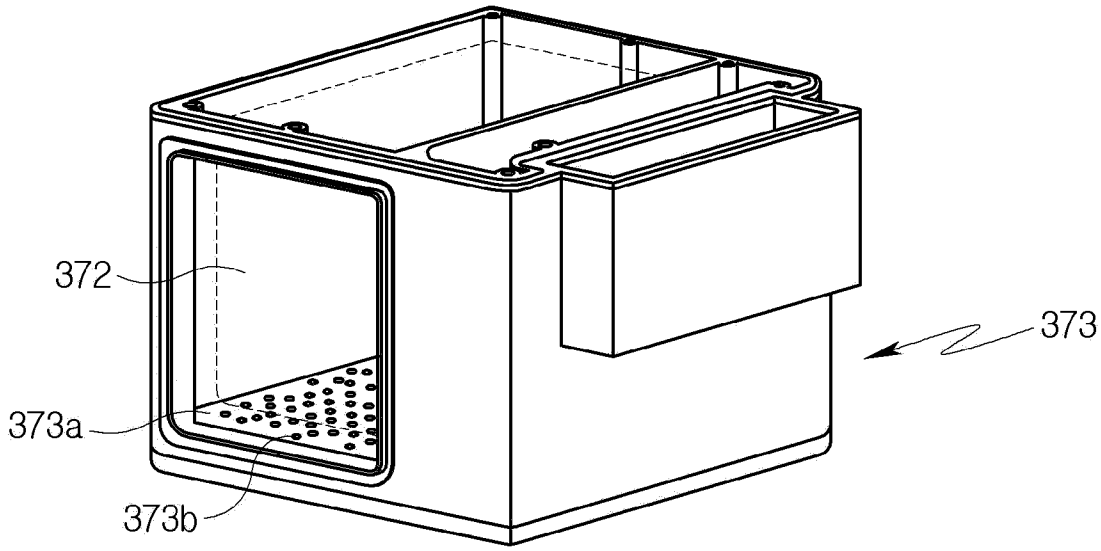
[FIG. 13]



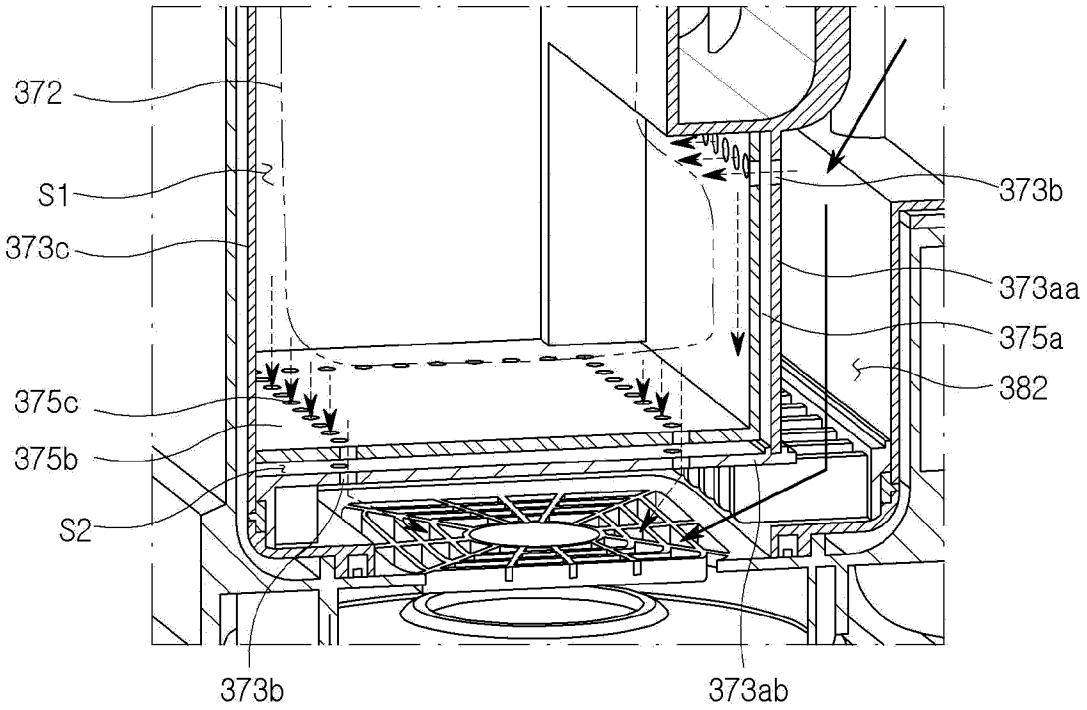
[FIG. 14]



[FIG. 15]


372
373
373a
373b

[FIG. 16]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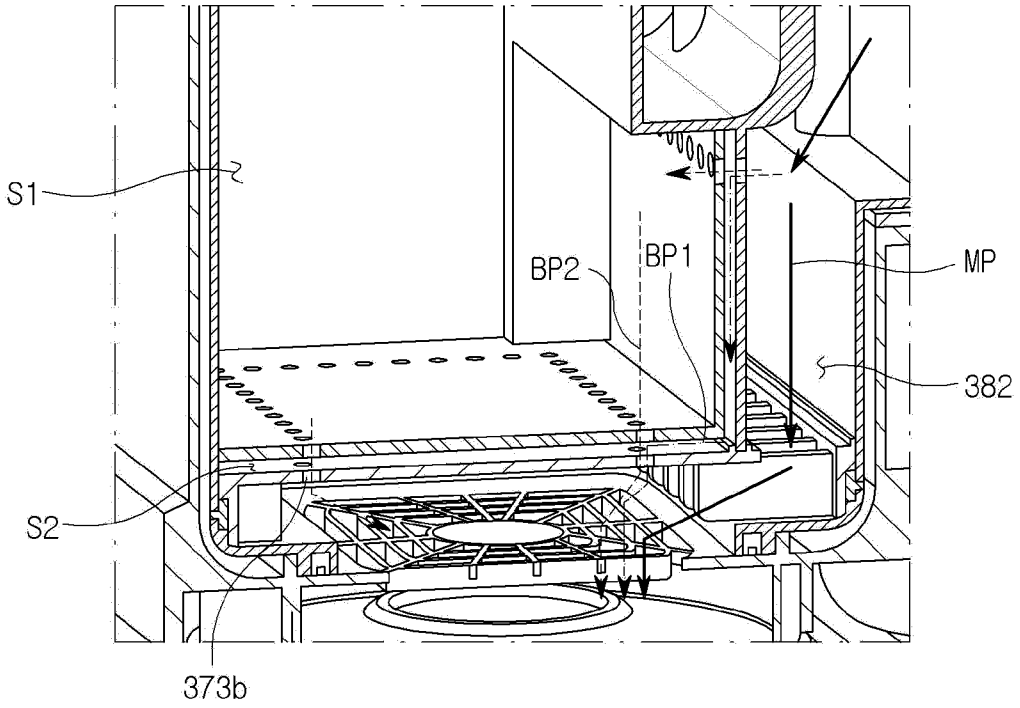
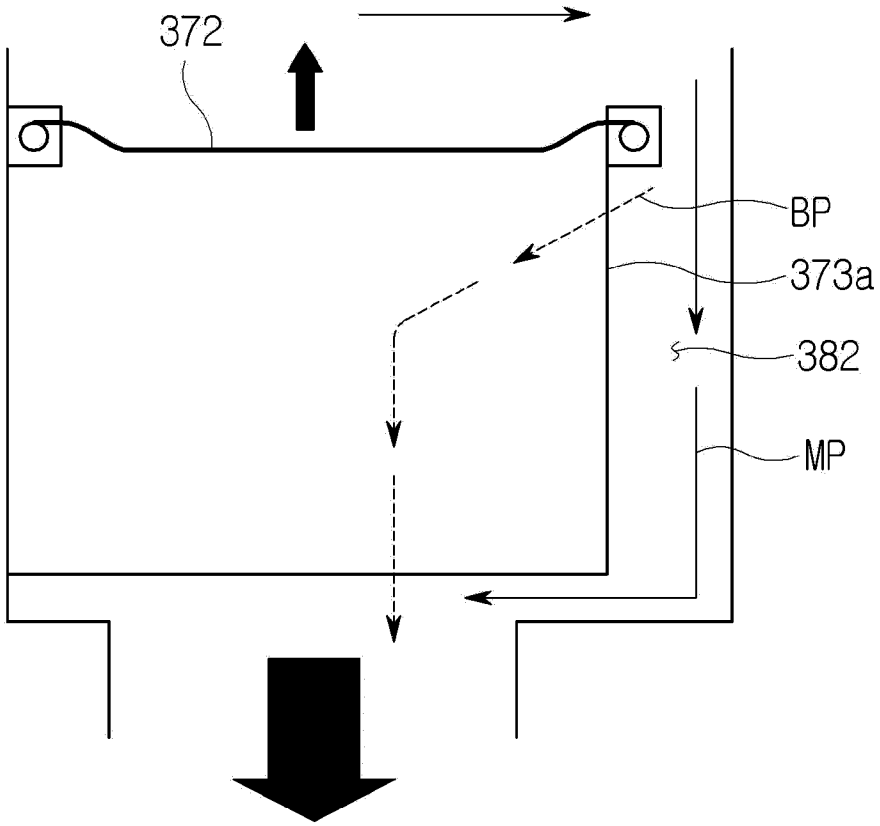
375c
375b
S2
373b
373ab
373b
373aa
375a
382

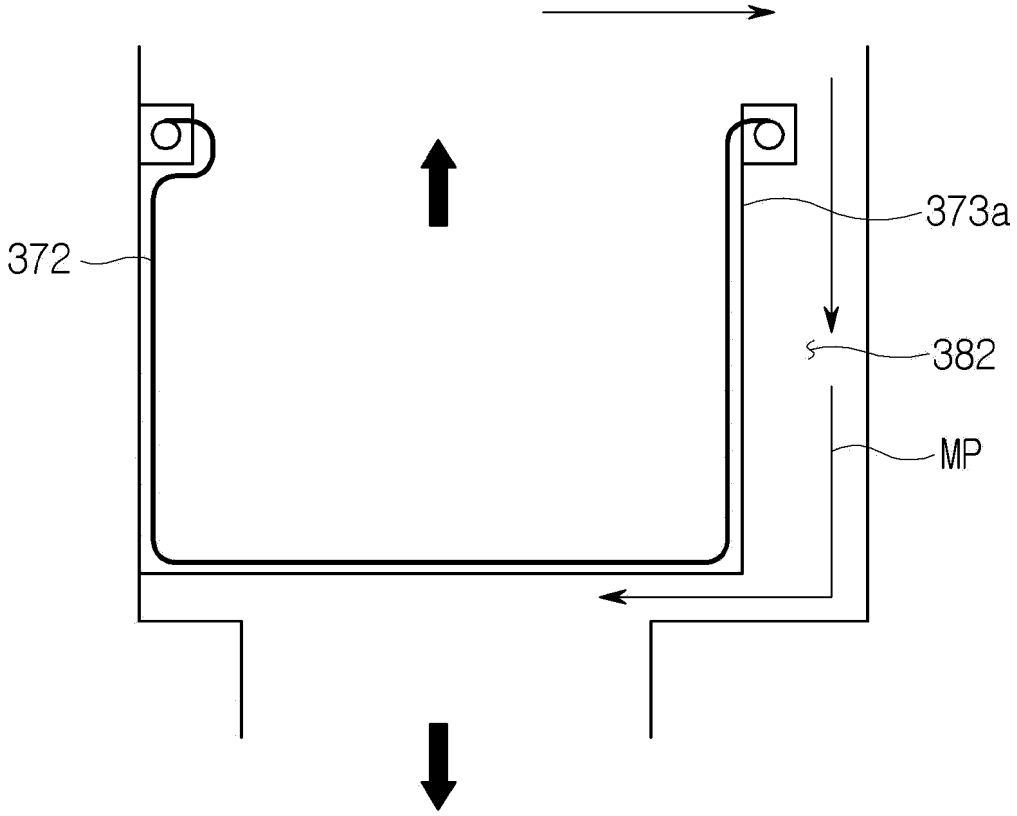
[FIG. 17]



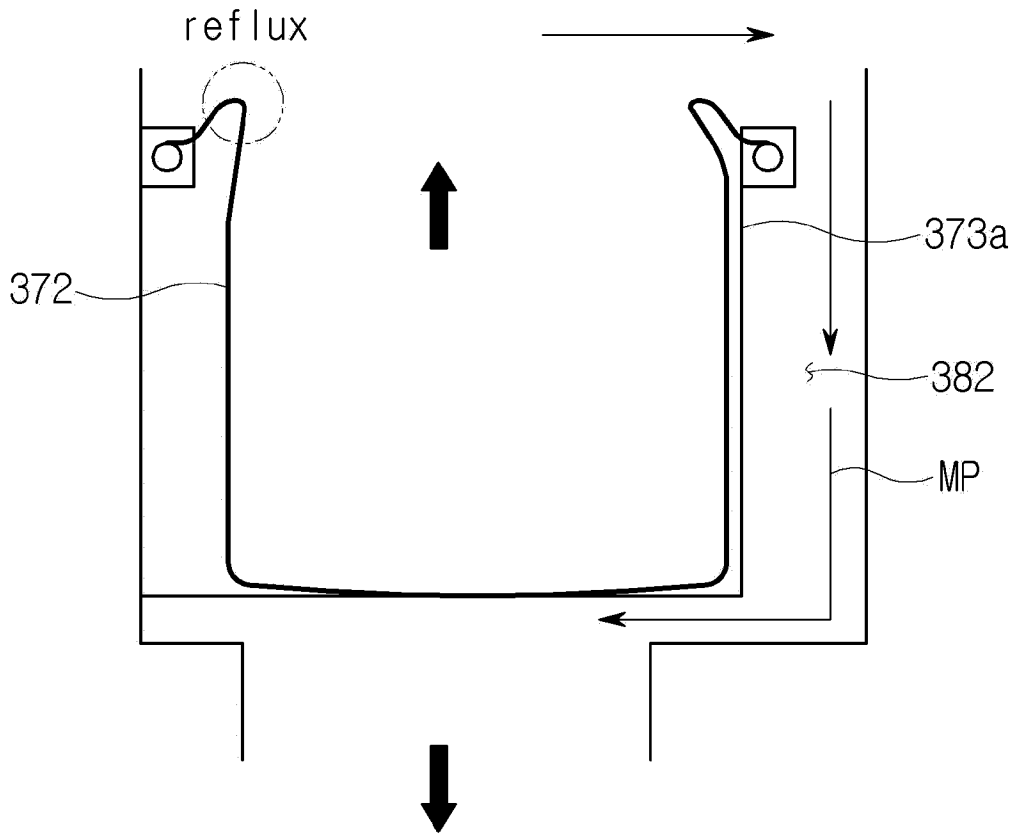
[FIG. 18]



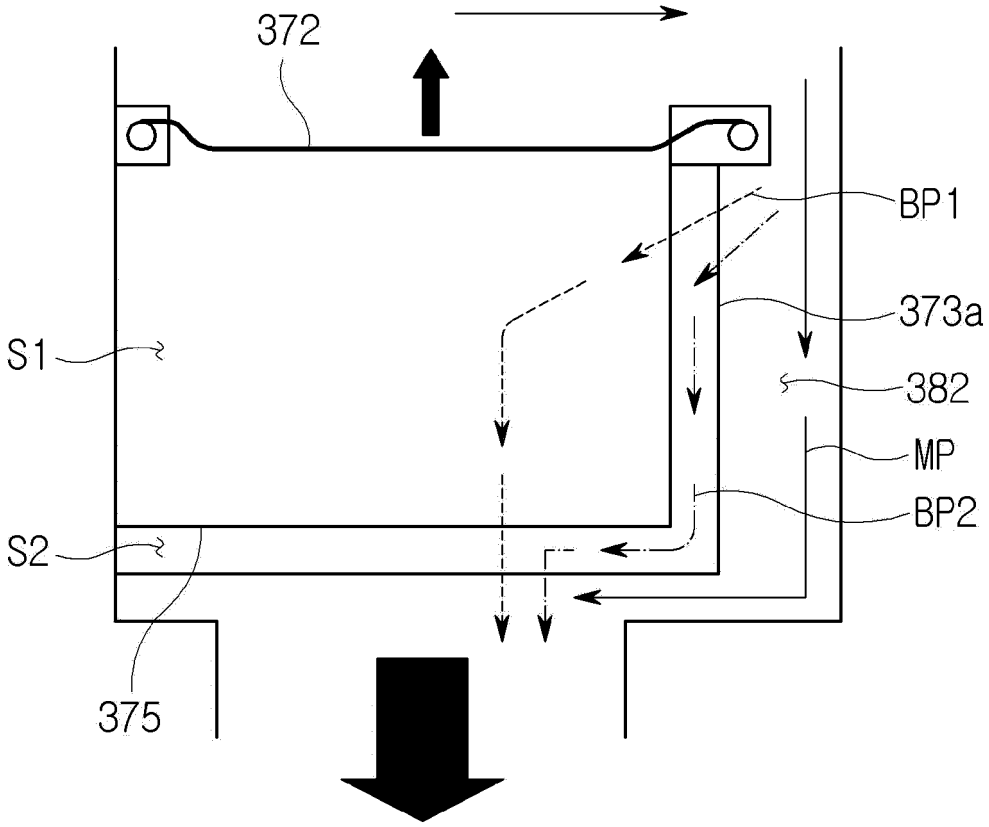
[FIG. 19]



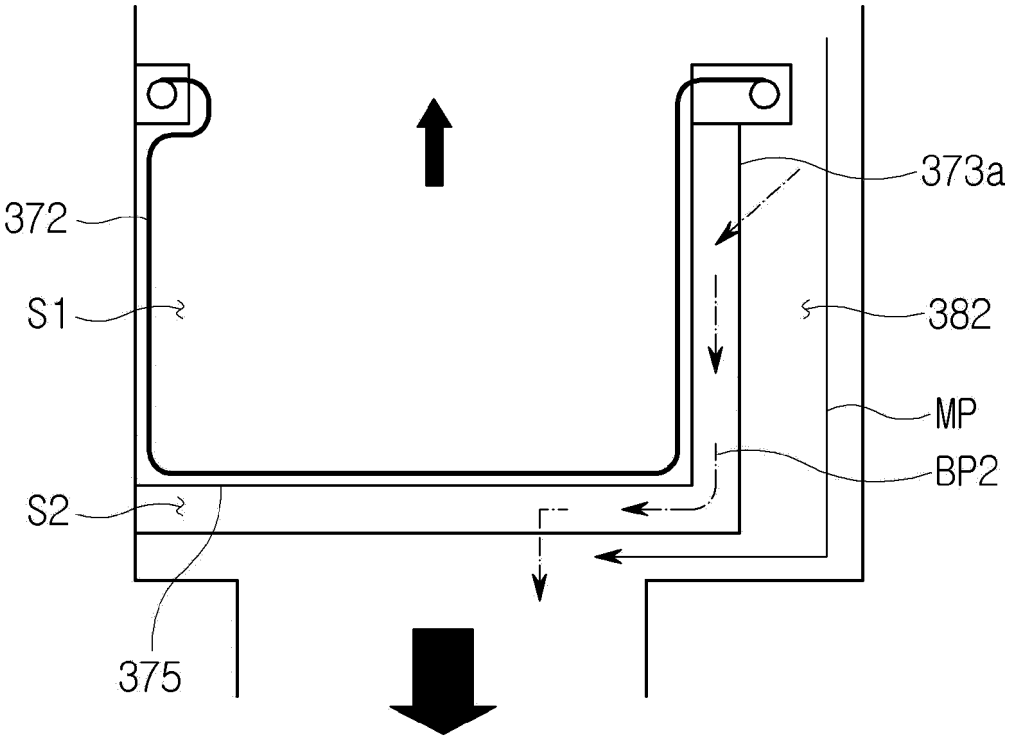
[FIG. 20]



[FIG. 21]



[FIG. 22]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2023/003854

A. CLASSIFICATION OF SUBJECT MATTER

A47L 9/14(2006.01)i; **A47L 9/12**(2006.01)i; **A47L 9/10**(2006.01)i; **A47L 9/28**(2006.01)i; **A47L 7/00**(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)

A47L 9/14(2006.01); A47L 5/12(2006.01); A47L 9/00(2006.01); A47L 9/10(2006.01); A47L 9/16(2006.01); A47L 9/28(2006.01); B65F 1/06(2006.01); B65F 1/14(2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models: IPC as above
Japanese utility models and applications for utility models: IPC as above

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

eKOMPASS (KIPO internal) & keywords: 청소기(vacuum cleaner), 스테이션(station), 먼지 봉투(dust bag), 바이패스(bypass), 먼지 분리부(dust separator), 사이클론(cyclone), 유로(flow path), 에어홀(air hole), 음압(negative pressure), 팽창(expansion), 프리필터(prefilter), 구획벽(partition wall)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2020-0073966 A (SAMSUNG ELECTRONICS CO., LTD.) 24 June 2020 (2020-06-24) See paragraphs [0040] and [0261]-[0304] and figures 1, 3 and 22-27.	1-3,6-9
A		4-5,10-15
Y	KR 10-1993773 B1 (INCHEON NATIONAL UNIVERSITY RESEARCH & BUSINESS FOUNDATION) 27 June 2019 (2019-06-27) See paragraphs [0021]-[0023] and [0033] and figures 1-3.	1-3,6-9
A	JP 2020-185096 A (TANAKA, Shinichi) 19 November 2020 (2020-11-19) See paragraphs [0011]-[0017] and figures 1-4.	1-15
A	CN 210019176 U (YONGKANG CHAORUI ELECTRICAL APPLIANCE CO., LTD.) 07 February 2020 (2020-02-07) See claim 1 and figures 1-8.	1-15

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

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"&" 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 June 2023	**28 June 2023**
Name and mailing address of the ISA/KR **Korean Intellectual Property Office** **Government Complex-Daejeon Building 4, 189 Cheongsa-ro, Seo-gu, Daejeon 35208** Facsimile No. **+82-42-481-8578**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2023/003854

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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International application No.
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REFERENCES CITED IN THE DESCRIPTION

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- KR 2161708 **[0014]**
- KR 20210128783 **[0017]**