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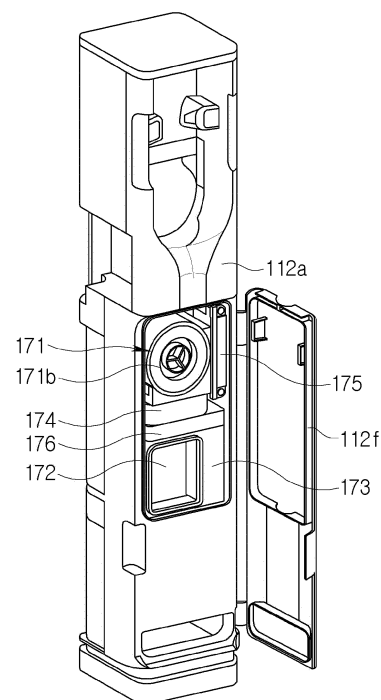
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(54) **CLEANER STATION**

(57) The present disclosure relates to a cleaner station, in which a dust collecting part may be coupled and separated in a direction intersecting a longitudinal direction of a housing, and a cyclone part, a dust bag, and a dust bag cartridge may also be coupled and separated in the same direction, such that a user may easily maintain components of the dust collecting part.

[FIG. 12]



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Description

[Technical Field]

[0001] The present disclosure relates to a cleaner station, and more particularly, to a cleaner station capable of separating dust contained in air, capturing the dust in a dust bag, and enabling a user to empty only the dust bag.

[Background Art]

[0002] 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.

[0003] 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.

[0004] 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.

[0005] 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.

[0006] 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.

[0007] 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.

[0008] In addition, recently, a robot cleaner, which autonomously performs a cleaning operation without a user's manipulation, is used. The robot cleaner automatically cleans a zone to be cleaned by sucking debris such as dust from the floor while autonomously traveling in the zone to be cleaned.

[0009] However, because the handy cleaner, the stick

cleaner, or the robot cleaner in the related art has a dust bin with a small capacity for storing collected dust, which inconveniences the user because the user needs to empty the dust bin frequently.

[0010] In addition, because the dust scatters during the process of emptying the dust bin, there is a problem in that the scattering dust has a harmful effect on the user's health.

[0011] In addition, if residual dust is not removed from the dust bin, there is a problem in that a suction force of the cleaner deteriorates.

[0012] In addition, if the residual dust is not removed from the dust bin, there is a problem in that the residual dust causes an offensive odor.

[0013] As a patent document in the related art, Korean Patent No. KR 10-2161708 B1 discloses a station including a dust bag.

[0014] Korean Patent No. KR 10-2161708 B1 discloses that a dust bin of a cleaner is coupled to the station, and a dust bag is disposed in the station. In this case, the dust bag is coupled in a housing of the cleaner along a sliding groove, and an outer surface of the dust bag is made of a material that may filter the air while transmitting the air.

[0015] However, in case that a permeable or semi-permeable dust bag is used, there is a problem in that dust in the dust bag may leak to the outside from the dust bag, and offensive odor may also leak to the outside from the dust bag.

[0016] In addition, as a patent document in the related art, Korean Patent Application Laid-Open No. KR 10-2021-0019940 A discloses a cleaner station configured to capture dust collected in a dust bin of a cleaner.

[0017] Korean Patent Application Laid-Open No. KR 10-2021-0019940 A discloses that the cleaner sucks dust contained in the air and stores the dust, the cleaner station is coupled to the dust bin to remove dust stored in the dust bin, and the cleaner station includes a dust collecting motor configured to suck debris and internal air in the dust bin coupled to the cleaner station, and a vinyl bag type dust collecting part.

[0018] However, in the case of the cleaner station, when the dust collecting motor operates, the vinyl bag may be pulled toward the dust collecting motor and squashed flat.

[0019] Therefore, when the dust collecting motor of the cleaner station operates, an internal space of the vinyl bag is narrowed, which makes it difficult to capture the dust in the vinyl bag.

[0020] In addition, in the case of the cleaner station, the air from which dust is not separated is captured in the vinyl bag, which causes a problem in that a part of the dust is introduced into the dust collecting motor.

[0021] Meanwhile, the cleaner station needs to be equipped with a cartridge capable of replacing a consumable vinyl bag.

[0022] In this case, because the cartridge for replacing the vinyl bag is detachably coupled to a housing, there is a

limitation in that dust contained in air scatters through a space in which the cartridge is coupled.

[Disclosure]

[Technical Problem]

[0023] The present disclosure has been made in an effort to solve the above-mentioned problems with the cleaner station in the related art, and an object of the present disclosure is to provide a cleaner station capable of maintaining a shape of a dust bag while dust is collected.

[0024] The present disclosure has also been made in an effort to provide a cleaner station, in which dust may be separated from the air during a process in which the air containing the dust flows toward a dust collecting motor, and the dust may be captured in the dust bag.

[0025] The present disclosure has also been made in an effort to provide a cleaner station that does not require a user to manually tie a dust bag.

[0026] The present disclosure has also been made in an effort to provide a cleaner station that enables a user to empty a dust bin only by removing a dust bag.

[0027] The present disclosure has also been made in an effort to provide a cleaner station capable of supplying a new dust bag when a dust bag is consumed.

[0028] The present disclosure has also been made in an effort to provide a cleaner station capable of preventing dust from scattering in a cartridge capable of supplying a dust bag.

[0029] The present disclosure has also been made in an effort to provide a cleaner station in which a dust collecting part may be easily detached.

[0030] The present disclosure has also been made in an effort to provide a cleaner station in which a dust collecting part may be easily detached.

[0031] The present disclosure has also been made in an effort to provide a cleaner station in which components of a dust collecting part may be separately detached and maintained.

[Technical Solution]

[0032] In order to achieve the above-mentioned objects, a cleaner station according to the present disclosure may be configured such that a dust collecting part may be coupled and separated in a direction intersecting a longitudinal direction of a housing, and a cyclone part, a dust bag, and a dust bag cartridge may also be coupled and separated in the same direction.

[0033] Specifically, the present disclosure provides a cleaner station including: a housing; a coupling part disposed in the housing and configured such that at least a part of a cleaner is coupled to the coupling part; a dust collecting part accommodated in the housing, disposed at a lower side of the coupling part, and configured to capture dust in a dust bin of the cleaner; and a dust

collecting motor accommodated in the housing, disposed below the dust collecting part, and configured to generate a suction force for sucking dust in the dust bin, in which the dust collecting part includes: a dust separating part configured to separate dust in air introduced from the dust bin; a dust bag configured to store the dust separated by the dust separating part; a bag support part configured to accommodate the dust bag; and a dust bag cartridge separably coupled to a lower side of the dust separating part and configured to supply the dust bag.

[0034] In this case, the dust collecting part may be attached to or detached from the housing in a direction that traverses a longitudinal direction of the housing.

[0035] Meanwhile, the dust separating part may include: a dust separating part casing; and a cyclone part coupled to the dust separating part casing and configured to separate dust from air, and the cyclone part may be detachably coupled to the dust separating part casing.

[0036] In this case, the cyclone part may be attached to or detached from the dust separating part casing in a direction that traverses a longitudinal direction of the housing.

[0037] The dust bag may be separated from the bag support part in a direction that traverses a longitudinal direction of the housing.

[0038] Meanwhile, the bag support part may have a bag passage hole through which the dust bag passes in a direction that traverses a longitudinal direction of the housing.

[0039] Meanwhile, the dust bag cartridge may be separated between the dust separating part and the joining device in a direction that traverses a longitudinal direction of the housing.

[0040] Meanwhile, the dust collecting part may further include a prefilter configured to separate dust from air passing through the dust separating part, and the prefilter may be separated in a direction that traverses a longitudinal direction of the housing.

[0041] Meanwhile, the housing may include: a bottom surface disposed to face a ground surface; and an outer wall surface disposed in a direction that traverses the bottom surface, and a dust collecting part entrance hole, through which the dust collecting part enters or exits, may be formed in the outer wall surface.

[Advantageous Effects]

[0042] According to the cleaner station according to the present disclosure described above, it is possible to maintain the shape of the dust bag during the process of collecting dust.

[0043] In addition, during the process in which the air containing dust flows toward the dust collecting motor, the dust may be separated and captured in the dust bag.

[0044] In addition, because the upper side of the dust bag is joined by the joining device, the user may seal the dust bag without manually tying the dust bag.

[0045] In addition, the user may empty the dust bin only

by removing the sealed dust bag.

[0046] In addition, the dust bag cartridge may automatically supply a new dust bag in case that the dust bag is consumed.

[0047] In addition, the dust bag supplied from the dust bag cartridge may be joined and sealed, which may prevent dust from scattering.

[0048] In addition, the detachment directions of the dust collecting part and the components thereof are defined to be identical to one another, which makes it easy to detach the dust collecting part.

[0049] In addition, the components of the dust collecting part are detachably configured, and the detachment directions of the components are defined to be identical to one another, which makes it easy to maintain the components.

[Description of Drawings]

[0050]

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

FIG. 2 is a schematic view of a configuration of a cleaner according to the embodiment of the present disclosure.

FIG. 3 is a view illustrating the cleaner in FIG. 2 when viewed at another angle.

FIG. 4 is a view for explaining a lower side of a dust bin of the cleaner in the cleaner system according to the embodiment of the present disclosure.

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

FIG. 6 is a perspective view for explaining a fixing unit of the cleaner station according to the embodiment of the present disclosure.

FIGS. 7 and 8 are views for explaining a relationship between the cleaner and a door unit in the cleaner station according to the embodiment of the present disclosure.

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

FIG. 10 is a view for explaining a specific arrangement and configuration of a dust collecting part in the cleaner station according to the embodiment of the present disclosure.

FIG. 11 is a view for explaining an internal structure of the cleaner station according to the embodiment of the present disclosure.

FIG. 12 is a view for explaining a process of attaching and detaching the dust collecting part in the cleaner station according to the embodiment of the present disclosure.

FIG. 13 is a view for explaining the dust collecting

part in the cleaner station according to the embodiment of the present disclosure.

FIG. 14 is a perspective view for explaining a dust separating part in the cleaner station according to the embodiment of the present disclosure.

FIG. 15 is a perspective view for explaining a bag support part in the cleaner station according to the embodiment of the present disclosure.

FIG. 16 is a perspective view for explaining a dust bag cartridge in the cleaner station according to the embodiment of the present disclosure.

FIG. 17 is a view for explaining a configuration of a joining device in the cleaner station according to the embodiment of the present disclosure.

FIG. 18 is a view for explaining a flow path part and a prefilter in the cleaner station according to the embodiment of the present disclosure.

FIG. 19 is a block diagram for explaining a control configuration in the cleaner station according to the embodiment of the present disclosure.

[Mode for Invention]

[0051] Hereinafter, exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawings.

[0052] 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.

[0053] The terminology used herein is used for the purpose of describing particular embodiments only and is not intended to limit the present disclosure. Singular expressions may include plural expressions unless clearly described as different meanings in the context.

[0054] Unless otherwise defined, all terms used herein, including technical or scientific terms, may have the same meaning as commonly understood by those skilled in the art to which the present disclosure pertains. The terms such as those defined in a commonly used dictionary may be interpreted as having meanings consistent with meanings in the context of related technologies and may not be interpreted as ideal or excessively formal meanings unless explicitly defined in the present application.

[0055] FIG. 1 is a view for explaining a cleaner system according to an embodiment of the present disclosure.

[0056] With reference to FIG. 1, a cleaner system 1 according to the embodiment of the present specification may include a cleaner 200 and a cleaner station 100.

[0057] The cleaner system 1 may include the cleaner station 100. The cleaner 200 may be coupled to the cleaner station 100. The cleaner 200 may be coupled

to a lateral side of the cleaner station 100. The cleaner station 100 may remove dust from a dust bin 220 of the cleaner 200.

[0058] FIG. 2 is a schematic view of a configuration of the cleaner according to the embodiment of the present disclosure, FIG. 3 is a view illustrating the cleaner in FIG. 2 when viewed at another angle, and FIG. 4 is a view for explaining a lower side of the dust bin of the cleaner in the cleaner system according to the embodiment of the present disclosure.

[0059] First, a structure of the cleaner 200 will be described below with reference to FIGS. 2 to 4.

[0060] The cleaner 200 may mean a cleaner configured to be manually operated by the user. For example, the cleaner 200 may mean a handy cleaner or a stick cleaner.

[0061] The cleaner 200 may be mounted on the cleaner station 100. The cleaner 200 may be supported by the cleaner station 100. The cleaner 200 may be coupled to the cleaner station 100.

[0062] Meanwhile, in the embodiment of the present disclosure, directions of the cleaner 200 may be defined on the basis of when a bottom surface (lower surface) of the dust bin 220 and a bottom surface (lower surface) of a battery housing 230 are placed on the ground surface.

[0063] 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 rearward direction may mean a direction in which a handle 216 is disposed based on the suction motor 214. Further, based on a state in which the suction part 212 is viewed from the suction motor 214, a rightward 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 based on 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.

[0064] 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.

[0065] 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 the suction motor 214 and a filter (not illustrated) therein. The main body housing 211 may be formed in a shape similar to a cylindrical shape.

[0066] 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.

[0067] Meanwhile, in the present embodiment, an imaginary line may be defined to penetrate the inside of the suction part 212 having a cylindrical shape.

[0068] The dust separating part 213 may communicate with the suction part 212. The dust separating part 213 may separate dust sucked into the dust separating part 213 through the suction part 212. A space in the dust separating part 213 may communicate with a space in the dust bin 220.

[0069] For example, the dust separating part 213 may have one or more cyclone parts capable of separating dust by using a cyclone flow. Further, the space in the dust separating part 213 may communicate with the suction flow path. Therefore, air and dust, which are sucked through the suction part 212, spirally flow along an inner circumferential surface of the dust separating part 213. Therefore, the cyclone flow may be generated in an internal space of the dust separating part 213.

[0070] The dust separating part 213 communicates with the suction part 212. The dust separating part 213 adopts a principle of a dust collector using a centrifugal force to separate the dust sucked into the main body 210 through the suction part 212.

[0071] The dust separating part 213 may further include a secondary cyclone part configured to separate again dust from the air discharged from the cyclone part. In this case, the secondary cyclone part may be positioned in the cyclone part to minimize a size of the dust separating part. The secondary cyclone part may include a plurality of cyclone bodies disposed in parallel. The air discharged from the cyclone part may be distributed to and pass through the plurality of cyclone bodies.

[0072] In this case, an axis of a cyclone flow of the secondary cyclone part may also extend in an upward/downward direction. The axis of the cyclone flow of the cyclone part and the axis of the cyclone flow of the secondary cyclone part may be disposed coaxially in the upward/downward direction and collectively called an axis of the cyclone flow of the dust separating part 213.

[0073] The suction motor 214 may generate a suction force for sucking air. The suction motor 214 may be accommodated in the main body housing 211. The suction motor 214 may generate the suction force while rotating. For example, the suction motor 214 may be formed in a shape similar to a cylindrical shape.

[0074] Meanwhile, in the present embodiment, an imaginary suction motor axis may be formed by extending a rotation axis of the suction motor 214.

[0075] The air discharge cover 215 may be disposed at one side of the main body housing 211 based on an axial direction. The air discharge cover 215 may accommodate the filter for filtering air. For example, an HEPA filter may be accommodated in the air discharge cover 215.

[0076] 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.

[0077] A flow guide may be disposed on the air dis-

charge cover 215. The flow guide may guide a flow of the air to be discharged through the air discharge port.

[0078] The handle 216 may be gripped by the user. The handle 216 may be disposed rearward 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.

[0079] The handle 216 may include a grip portion 216a formed in a column shape so that the user may grip the grip portion 216a, a first extension portion 216b connected to one end of the grip portion 216a based on the longitudinal direction (axial direction) and extending toward the suction motor 214, and a second extension portion 216c connected to the other end of the grip portion 216a based on the longitudinal direction (axial direction) and extending toward the dust bin 220.

[0080] Meanwhile, in the present embodiment, an imaginary grip portion through line may be formed to extend in the longitudinal direction of the grip portion 216a (the axial direction of the column) and penetrate the grip portion 216a.

[0081] For example, the grip portion through line may be an imaginary line formed in the handle 216 having a cylindrical shape, that is, an imaginary line formed in parallel with at least a part of an outer surface (outer circumferential surface) of the grip portion 216a.

[0082] An upper side of the handle 216 may define an external appearance of a part of an upper side 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 grips the handle 216.

[0083] The first extension portion 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 may extend in a horizontal direction.

[0084] The second extension portion may extend from the grip portion 216a toward the dust bin 220. At least a part of the second extension portion may extend in the horizontal direction.

[0085] 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 a command for operating or stopping the cleaner 200 through the operating part 218.

[0086] 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 by the dust separating part 213.

[0087] 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).

[0088] 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.

[0089] Meanwhile, in the present embodiment, an imaginary dust bin through line may be formed to penetrate the inside (internal space) of the dust bin main body 221 and extend in the longitudinal direction of the dust bin main body 221 (that means the axial direction of the cylindrical dust bin main body 221).

[0090] A part of a lower side (bottom side) of the dust bin main body 221 may be opened. In addition, a lower extension portion 221a may be formed at the lower side (bottom side) of the dust bin main body 221. The lower extension portion 221a may be formed to block a part of the lower side of the dust bin main body 221.

[0091] The dust bin 220 may include the discharge cover 222. The discharge cover 222 may be disposed at a lower side of the dust bin 220.

[0092] The discharge cover 222 may be provided to open or close one end of the dust bin main body 221 based on the longitudinal direction. Specifically, the discharge cover 222 may selectively open or close the lower side of the dust bin 220 that is opened downward.

[0093] 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 side of the dust bin main body 221. The cover main body 222a may rotate downward relative to the hinge portion 222b. The hinge part 222b may be disposed adjacent to the battery housing 230. The hinge part 222b may have a torsion spring 222d. Therefore, when the discharge cover 222 is separated from the dust bin main body 221, an elastic force of the torsion spring 222d may support the cover main body 222a in a state in which the cover main body 222a is rotated by a predetermined angle or more about the hinge part 222b with respect to the dust bin main body 221.

[0094] 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 side of the dust bin. Specifically, the coupling lever 222c may be disposed on an outer surface at the front side of the dust bin 220. When an external force is applied, the coupling lever 222c may elastically deform a hook, which extends 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.

[0095] When the discharge cover 222 is closed, the lower side of the dust bin 220 may be blocked (sealed) by the discharge cover 222 and the lower extension portion 221a.

[0096] The dust bin 220 may include the dust bin compression lever 223 (see FIG. 3). The dust bin compression lever 223 may be disposed outside the dust bin 220 or the dust separating part 171. 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. Therefore, it is possible to provide convenience for the user. The compression member (not illustrated) and the dust bin compression lever 223 may return back to original positions by an elastic member (not illustrated). Specifically, 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.

[0097] 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. Specifically, the compression member may move upward and downward in the dust bin main body 221. Therefore, the compression member may compress downward the dust in the dust bin main body 221. 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 the 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.

[0098] 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 below the handle 216. For example, the battery housing 230 may have a hexahedral shape opened at a lower side thereof. A rear side of the battery housing 230 may be connected to the handle 216.

[0099] The battery housing 230 may include an accommodation portion opened downward. The battery 240 may be attached or detached through the accommodation portion of the battery housing 230.

[0100] The cleaner 200 may include the battery 240.

[0101] 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. With this configuration, the portability of the cleaner 200 may be improved.

[0102] On the contrary, 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.

[0103] The battery 240 may supply power to the suction motor 214 of the cleaner 200. The battery 240 may be disposed below the handle 216. The battery 240 may be disposed at a rear side of the dust bin 220.

[0104] In case that the battery 240 is coupled to the battery housing 230 in accordance with the 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 side of the battery 240 is exposed to the outside and thus in direct contact with the air present outside the battery 240, the performance in cooling the battery 240 may be improved.

[0105] Meanwhile, in case that the battery 240 is fixed integrally to the battery housing 230, the number 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 of the cleaner 200.

[0106] 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 212 of the main body 210. The extension tube 250 may be formed in a long cylindrical shape.

[0107] 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.

[0108] 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.

[0109] The dust in the dust bin 220 of the cleaner 200 may be captured by a dust collecting part 170 of the cleaner station 100 by gravity and a suction force of a dust collecting motor 191. Therefore, it is possible to remove the dust in the dust bin without the user's separate manipulation, thereby providing convenience for the user. In addition, it is possible to eliminate the inconvenience caused because the user needs to empty the dust bin all the time. In addition, it is possible to prevent the dust from scattering when emptying the dust bin.

[0110] The cleaner 200 may be coupled to a lateral surface of a housing 110. Specifically, the main body 210 of the cleaner 200 may be mounted on a coupling part 120. More specifically, the dust bin 220 and the battery housing 230 of the cleaner 200 may be coupled to a coupling surface 121, an outer circumferential surface of the dust bin main body 221 may be coupled to a dust bin guide surface 122, and the suction part 212 may be

coupled to a suction part guide surface 126 of the coupling part 120. In this case, a central 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 in a direction perpendicular to the ground surface.

[0111] FIG. 5 is a view for explaining the coupling part in the cleaner station according to the embodiment of the present disclosure, FIG. 6 is a view for explaining a fixing unit in the cleaner station according to the embodiment of the present disclosure, FIGS. 7 and 8 are views for explaining a relationship between the cleaner and a door unit in the cleaner station according to the embodiment of the present disclosure, FIG. 9 is a view for explaining a relationship between the cleaner and a cover opening unit in the cleaner station according to the embodiment of the present disclosure, FIG. 10 is a view for explaining a specific arrangement and configuration of the dust collecting part in the cleaner station according to the embodiment of the present disclosure, and FIG. 11 is a view for explaining an internal structure of the cleaner station according to the embodiment of the present disclosure.

[0112] The cleaner station 100 of the present disclosure will be described below with reference to FIGS. 5 to 11.

[0113] The cleaner 200 may be coupled to the cleaner station 100. Specifically, the main body of the cleaner 200 may be coupled to the lateral surface of the cleaner station 100. The cleaner station 100 may remove dust from the dust bin 220 of the cleaner 200.

[0114] The cleaner station 100 may include the housing 110. The housing 110 may define an external appearance of the cleaner station 100. Specifically, the housing 110 may be provided in the form of a column including one or more outer wall surfaces. For example, the housing 110 may be formed in a shape similar to a quadrangular column.

[0115] The housing 110 may have a space capable of accommodating the dust collecting part 170 configured to store dust therein, and a dust suction module 190 configured to generate a flow force for collecting the dust in the dust collecting part 170.

[0116] The housing 110 may include a bottom surface 111, an outer wall surface 112, and an upper surface 113.

[0117] The bottom surface 111 may support a lower side of the dust suction module 190 based on the gravitational direction. That is, the bottom surface 111 may support a lower side of the dust collecting motor 191 of the dust suction module 190.

[0118] In this case, the bottom surface 111 may be disposed toward the ground surface. The bottom surface 111 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 191 and maintaining balance of an overall weight even in a case in which the cleaner 200 is coupled.

[0119] Meanwhile, according to the embodiment, the

bottom surface 111 may further include a ground surface support portion 311a in order to prevent the cleaner station 100 from falling down and increase an area being in contact with the ground surface to maintain the balance. For example, the ground surface support portion 311a may have a plate shape extending from the bottom surface 111, and one or more frames may protrude and extend from the bottom surface 111 in the direction of the ground surface.

[0120] The outer wall surface 112 may be disposed in a direction that traverses the bottom surface 111. That is, the outer wall surface 112 may mean a surface formed in the gravitational direction or a surface connected to the bottom surface 111. For example, the outer wall surface 112 may mean a surface connected to the bottom surface 111 so as to be perpendicular to the bottom surface 111. As another embodiment, the outer wall surface 112 may be disposed to be inclined at a predetermined angle with respect to the bottom surface 111.

[0121] The outer wall surface 112 may include at least one surface. For example, the outer wall surface 112 may include a first outer wall surface 112a, a second outer wall surface 112b, a third outer wall surface 112c, and a fourth outer wall surface 112d.

[0122] In this case, in the present embodiment, the first outer wall surface 112a may be disposed at the front side of the cleaner station 100. In this case, the front side may mean a side at which the cleaner 200 is exposed in the state in which the cleaner 200 is coupled to the cleaner station 100. Therefore, the first outer wall surface 112a may define an external appearance of the front side of the cleaner station 100.

[0123] 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 mounted on the cleaner station 100.

[0124] In the state in which the cleaner 200 is mounted on the cleaner station 100, a direction in which the cleaner 200 is exposed to the outside of the cleaner station 100 may be referred to as a forward direction.

[0125] In another point of view, in the state in which the cleaner 200 is mounted on the cleaner station 100, 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 on the cleaner station 100 may be referred to as a rearward direction.

[0126] Further, based on the internal space of the housing 110, a surface facing the front surface may be referred to as a rear surface of the cleaner station 100. Therefore, the rear surface may mean a direction in which the second outer wall surface 112b is formed.

[0127] Further, based on the internal space of the housing 110, 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 112c is formed, and the right surface may mean a direction in which the fourth outer wall surface 112d is formed.

[0128] The first outer wall surface 112a may be formed in the form of a flat surface, or the first outer wall surface 112a may be formed in the form of a curved surface as a whole or formed to partially include a curved surface.

[0129] The coupling part 120 may be disposed on the first outer wall surface 112a. With this configuration, the cleaner 200 may be coupled to the cleaner station 100 and supported by the cleaner station 100. The specific configuration of the coupling part 120 will be described below.

[0130] Meanwhile, a structure for mounting various types of cleaning modules 260 used for the cleaner 200 may be additionally provided on the first outer wall surface 112a.

[0131] In the present embodiment, the second outer wall surface 112b may be a surface facing the first outer wall surface 112a. That is, the second outer wall surface 112b may be disposed on the rear surface of the cleaner station 100. The second outer wall surface 112b may define an external appearance of the rear surface of the cleaner station 100.

[0132] In the present embodiment, the third outer wall surface 112c and the fourth outer wall surface 112d may mean surfaces that connect the first outer wall surface 112a and the second outer wall surface 112b. In this case, the third outer wall surface 112c may be disposed on the left surface of the cleaner station 100, and the fourth outer wall surface 112d may be disposed on the right surface of the cleaner station 100. On the contrary, the third outer wall surface 112c may be disposed on the right surface of the cleaner station 100, and the fourth outer wall surface 112d may be disposed on the left surface of the cleaner station 100.

[0133] The third outer wall surface 112c or the fourth outer wall surface 112d may be formed in the form of a flat surface, or the third outer wall surface 112c or the fourth outer wall surface 112d may be formed in the form of a curved surface as a whole or formed to partially include a curved surface.

[0134] 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 112c or the fourth outer wall surface 112d.

[0135] The upper surface 113 may define an upper external appearance of the cleaner station. That is, the upper surface 113 may mean a surface disposed at an outermost side of the cleaner station in the gravitational direction and exposed to the outside.

[0136] For reference, in the present embodiment, the terms 'upper side' and 'lower side' may mean the upper and lower sides in the gravitational direction (a direction perpendicular to the ground surface) in the state in which the cleaner station 100 is installed on the ground surface.

[0137] In this case, the upper surface 113 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.

[0138] A display part may be disposed on the upper surface 113. For example, the display part may display a state of the cleaner station 100 and a state of the cleaner 200. The display part may further display information such as a cleaning process situation, a map of the cleaning zone, and the like.

[0139] Meanwhile, according to the embodiment, the upper surface 113 may be separable from the outer wall surface 112. In this case, when the upper surface 113 is separated, the battery separated from the cleaner 200 may be accommodated in the internal space surrounded by the outer wall surface 112, and a terminal (not illustrated) capable of charging the separated battery may be provided in the internal space.

[0140] Meanwhile, a bag accommodation space (not illustrated) may be formed in the housing 110. The bag accommodation space (not illustrated) may be disposed at a lower side of the coupling part 120 based on the gravitational direction and disposed above the dust suction module 190 based on the gravitational direction.

[0141] The dust collecting part 170 may be provided in the bag accommodation space (not illustrated). Specifically, a bag support part 173 to be described below may be accommodated in the bag accommodation space (not illustrated) so that the bag support part 173 may enter or exit the bag accommodation space (not illustrated). Further, a dust bag cartridge 174 to be described below may be detachably coupled to the bag accommodation space (not illustrated). In addition, a joining device 176 to be described below may be mounted in the bag accommodation space. The bag accommodation space may communicate with a first flow path 181, a second flow path 182, and a bypass flow path (not illustrated) that will be described below. With this configuration, the bag accommodation space may provide a space in which air and dust, which are introduced from the dust bin 220, may flow and be captured in a dust bag 172.

[0142] In the present disclosure, the cleaner 200 may be mounted on the outer wall surface 112 of the cleaner station 100. For example, the dust bin 220 and the battery housing 230 of the cleaner 200 may be coupled to the coupling surface 121 of the cleaner station 100. That is, the cleaner 200 may be mounted on the first outer wall surface 112a.

[0143] In this case, an axis of the suction motor 214 may be defined to be perpendicular to the first outer wall surface 112a. That is, the axis of the suction motor 214 may be defined in parallel with the ground surface.

[0144] An imaginary line, which penetrates the dust bin 220, may be defined to be perpendicular to the first outer wall surface 112a.

[0145] A longitudinal axis C of the housing 110 may be defined to be perpendicular to the ground surface. The longitudinal axis C of the housing 110 may be defined in parallel with at least any one of the first outer wall surface 112a, the second outer wall surface 112b, the third outer

wall surface 112c, and the fourth outer wall surface 112d.

[0146] When the cleaner 200 is coupled to the cleaner station 100, the axis of the suction motor 214 may intersect the longitudinal axis of the cleaner station 100. That is, a rotation axis of the suction motor 214 may intersect the longitudinal axis of the cleaner station 100.

[0147] In addition, when the cleaner 200 is coupled to the cleaner station 100, the battery 240 may be disposed to be farther from the ground surface than the rotation axis of the suction motor 214 from the ground surface. With this configuration, the cleaner 200 may be stably supported on the cleaner station 100.

[0148] When the cleaner 200 is coupled to the cleaner station 100, the imaginary line, which penetrates the dust bin 220, may intersect the longitudinal axis of the cleaner station 100. That is, the longitudinal axis of the dust bin 220 may intersect the longitudinal axis of the cleaner station 100. In this case, an intersection point between the longitudinal axis of the dust bin 220 and the longitudinal axis of the cleaner station 100 may be positioned in the housing 110, and more particularly, positioned in a flow path part 180.

[0149] Meanwhile, when the cleaner 200 is coupled to the cleaner station 100, the handle 216 may be disposed to be farther from the ground surface than the imaginary line, which penetrates the dust bin 220, from the ground surface. With this configuration, when the user grips the handle 216, the user may couple or separate the cleaner 200 to/from the cleaner station 100 only by simply moving the cleaner 200 in the direction parallel to the ground surface. As a result, it is possible to provide convenience for the user.

[0150] The coupling part 120 of the cleaner station 100 according to the present disclosure will be described below with reference to FIG. 5.

[0151] The cleaner station 100 may include the coupling part 120 to which the cleaner 200 is coupled. Specifically, the coupling part 120 may be disposed in the first outer wall surface 112a, and the main body 210, the dust bin 220, and the battery housing 230 of the cleaner 200 may be coupled to the coupling part 120.

[0152] The coupling part 120 may include the coupling surface 121. The coupling surface 121 may be disposed on the lateral surface of the housing 110. For example, the coupling surface 121 may mean a surface formed in the form of a groove which is concave toward the inside of the cleaner station 100 from the first outer wall surface 112a. That is, the coupling surface 121 may mean a surface formed to have a stepped portion with respect to the first outer wall surface 112a.

[0153] The cleaner 200 may be coupled to the coupling surface 121. For example, the coupling surface 121 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.

[0154] For example, an angle of the coupling surface 121 with respect to the ground surface may be a right angle. Therefore, it is possible to minimize a space of the cleaner station 100 when the cleaner 200 is coupled to the coupling surface 121.

[0155] As another example, the coupling surface 121 may be disposed to be inclined at a predetermined angle with respect to the ground surface. Therefore, the cleaner station 100 may be stably supported when the cleaner 200 is coupled to the coupling surface 121.

[0156] The coupling surface 121 may have a dust passage hole 121a through which air present outside the housing 110 may be introduced into the housing 110. The dust passage hole 121a 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 170. The dust passage hole 121a may be formed to correspond to the shape of the discharge cover 222 of the dust bin 220. The dust passage hole 121a may be formed to communicate with the flow path 180 to be described below.

[0157] The coupling part 120 may include dust bin guide surfaces 122. The dust bin guide surface 122 may be disposed on the first outer wall surface 112a. The dust bin guide surfaces 122 may be connected to the first outer wall surface 112a. In addition, the dust bin guide surface 122 may be connected to the coupling surface 121.

[0158] The dust bin guide surface 122 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 122. Therefore, it is possible to provide the convenience when coupling the cleaner 200 to the coupling surface 121.

[0159] Meanwhile, a protrusion moving hole 122a may be formed in the dust bin guide surface 122, and a push protrusion 151 to be described below may rectilinearly move along the protrusion moving hole 122a. In addition, a gearbox 155 may be provided below the dust bin guide surface 122 based on the gravitational direction and accommodate a gear or the like of a cover opening unit 150 to be described below. In this case, a guide space 122b, through which the push protrusion 151 may move, may be formed between the dust bin guide surface 122, the lower surface, and the upper surface of the gearbox 155. Further, the guide space 122b may communicate with the first flow path 181 through a bypass hole 122c. That is, the protrusion moving hole 122a, the guide space 122b, the bypass hole 122c, and the first flow path 181 may define one flow path. With this configuration, when the dust collecting motor 191 operates in the state in which the dust bin 220 is coupled to the coupling part 120, the dust or the like, which remains in the dust bin 220 and remains on the dust bin guide surface 122, may be sucked through the flow path.

[0160] The coupling part 120 may include guide protrusions 123. The guide protrusions 123 may be disposed on the coupling surface 121. The guide protrusions 123

may protrude upward from the coupling surface 121. Two guide protrusions 123 may be disposed to be spaced apart from each other. A distance between the two guide protrusions 123, which are spaced apart from each other, may correspond to a width of the battery housing 230 of the cleaner 200. Therefore, it is possible to provide the convenience when coupling the cleaner 200 to the coupling surface 121.

[0161] The coupling part 120 may include coupling part sidewalls 124. The coupling part sidewalls 124 may mean wall surfaces disposed at two opposite sides of the coupling surface 121 and may be perpendicularly connected to the coupling surface 121. The coupling part sidewalls 124 may be connected to the first outer wall surface 112a. In addition, the coupling part sidewalls 124 may define surfaces connected to the dust bin guide surface 122. Therefore, the cleaner 200 may be stably accommodated.

[0162] The coupling part 120 may include a coupling sensor 125. The coupling sensor 125 may detect whether the cleaner 200 is coupled to the coupling part 120.

[0163] The coupling sensor 125 may include a contact sensor. For example, the coupling sensor 125 may include a micro-switch. In this case, the coupling sensor 125 may be disposed on the guide protrusion 123. 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 125, such that the coupling sensor 125 may detect that the cleaner 200 is coupled to the coupling part.

[0164] Meanwhile, the coupling sensor 125 may include a contactless sensor. For example, the coupling sensor 125 may include an infrared ray (IR) sensor. In this case, the coupling sensor 125 may be disposed on the coupling part sidewall 124. Therefore, when the dust bin 220 or the main body 210 of the cleaner 200 passes the coupling part sidewall 124 and then reaches the coupling surface 121, the coupling sensor 125 may detect the presence of the dust bin 220 or the main body 210.

[0165] In the state in which the cleaner 200 is coupled to the cleaner station 100, the coupling sensor 125 may face the dust bin 220 or the battery housing 230 of the cleaner 200.

[0166] The coupling sensor 125 may be a mean for determining whether the cleaner 200 is coupled and power is applied to the battery 240 of the cleaner 200.

[0167] The coupling part 120 may include the suction part guide surface 126. The suction part guide surface 126 may be disposed on the first outer wall surface 112a. The suction part guide surface 126 may be connected to the dust bin guide surface 122. The suction part 212 may be coupled to the suction part guide surface 126. The suction part guide surface 126 may be formed in a shape corresponding to the shape of the suction part 212.

[0168] The coupling part 120 may further include fixing member entrance holes 127. The fixing member entrance hole 127 may be formed in the form of a long hole

along the coupling part sidewall 124 so that fixing members 131 may enter and exit the fixing member entrance hole 127.

[0169] With this configuration, when the user couples the cleaner 200 to the coupling part 120 of the cleaner station 100, the main body 210 of the cleaner 200 may be stably disposed on the coupling part 120 by the dust bin guide surface 122, the guide protrusions 123, and the suction part guide surface 126. 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 121.

[0170] Meanwhile, the cleaner station 100 may further include a charging part 128. The charging part 128 may be disposed on the coupling part 120. The charging part 128 may be electrically connected to the cleaner 200 coupled to the coupling part 120. The charging part 128 may supply power to the battery of the cleaner 200 coupled to the coupling part 120.

[0171] In addition, the cleaner station 100 may further include a lateral door (not illustrated). The lateral door may be disposed in the housing 110. The lateral door may selectively expose the dust collecting part 170 to the outside. Therefore, the user may easily remove the dust bag 172 from the cleaner station 100.

[0172] A fixing unit 130 according to the present disclosure will be described below with reference to FIG. 6.

[0173] The cleaner station 100 according to the present disclosure may include the fixing unit 130. The fixing unit 130 may be disposed on the coupling part sidewall 124. In addition, the fixing unit 130 may be disposed on a back surface to the coupling surface 121. The fixing unit 130 may fix the cleaner 200 coupled to the coupling surface 121. Specifically, the fixing unit 130 may fix the dust bin 220 and the battery housing 230 of the cleaner 200 coupled to the coupling surface 121.

[0174] The fixing unit 130 may include a fixing members 131 configured to fix the dust bin 220 and the battery housing 230 of the cleaner 200, and a fixing part motor 133 configured to operate the fixing members 131. In addition, the fixing unit 130 may further include fixing part links 135 configured to transmit power of the fixing part motor 133 to the fixing members 131.

[0175] The fixing member 131 may be disposed on the coupling part sidewall 124 and provided on the coupling part sidewall 124 so as to reciprocate in order to fix the dust bin 220. Specifically, the fixing members 131 may be accommodated in the fixing member entrance holes 127.

[0176] The fixing members 131 may be disposed at two opposite sides of the coupling part 120, respectively. For example, a pair of two fixing members 131 may be symmetrically disposed with respect to the coupling surface 121.

[0177] The fixing part motor 133 may provide power for moving the fixing member 131.

[0178] The fixing part links 135 may convert a rotational force of the fixing part motor 133 into the reciprocations of the fixing members 131.

[0179] A stationary sealer 136 may be disposed on the dust bin guide surface 122 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 136 by its own weight, such that the dust bin 220 and the dust bin guide surface 122 may be sealed.

[0180] The stationary sealer 136 may be disposed on an imaginary extension line of the fixing member 131. With this configuration, when the fixing part motor 133 operates and the fixing members 131 press the dust bin 220, a circumference of the dust bin 220 at the same height may be sealed.

[0181] According to the embodiment, the stationary sealer 136 may be disposed on the dust bin guide surface 122 and formed in the form of a bent line corresponding to an arrangement of the cover opening unit 150 to be described below.

[0182] Therefore, when the main body 210 of the cleaner 200 is disposed on the coupling part 120, the fixing unit 130 may fix the main body 210 of the cleaner 200. Specifically, when the coupling sensor 125 detects that the main body 210 of the cleaner 200 is coupled to the coupling part 120 of the cleaner station 100, the fixing part motor 133 may move the fixing members 131 to fix the main body 210 of the cleaner 200.

[0183] Therefore, it is possible to improve the suction force of the cleaner by preventing the residual dust from remaining in the dust bin. 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.

[0184] The door unit 140 according to the present disclosure will be described below with reference to FIGS. 7 and 8.

[0185] The cleaner station 100 according to the present disclosure may include the door unit 140. The door unit 140 may be configured to open or close the dust passage hole 121a.

[0186] The door unit 140 may include a door 141, a door motor 142, and a door arm 143.

[0187] The door 141 may be hingedly coupled to the coupling surface 121 and may open or close the dust passage hole 121a. The door 141 may include a door main body 141a.

[0188] The door main body 141a may be formed in a shape capable of blocking the dust passage hole 121a. For example, the door main body 141a may be formed in a shape similar to a circular plate shape.

[0189] Based on a state in which the door main body 141a blocks the dust passage hole 121a, the hinge part may be disposed at an upper side of the door main body 141a, and an arm coupling part 141b may be disposed at a lower side of the door main body 141a.

[0190] The door main body 141a may be formed in a shape capable of sealing the dust passage hole 121a. For example, an outer surface of the door main body 141a, which is exposed to the outside of the cleaner station 100, is formed to have a diameter corresponding

to a diameter of the dust passage hole 121a, and an inner surface of the door main body 141a, which is disposed in the cleaner station 100, is formed to have a diameter greater than the diameter of the dust passage hole 121a.

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 141b and reinforce a supporting force of the door main body 141a.

[0191] The hinge part may be a means by which the door 141 is hingedly coupled to the coupling surface 121. The hinge part may be disposed at an upper end of the door main body 141a and coupled to the coupling surface 121.

[0192] The arm coupling part 141b may be a means to which the door arm 143 is rotatably coupled. The arm coupling part 141b may be disposed at a lower side of the door main body 141a and rotatably coupled to the door main body 141a, and the door arm 143 may be rotatably coupled to the arm coupling part 141b.

[0193] With this configuration, when the door arm 143 pulls the door main body 141a in the state in which the door 141 closes the dust passage hole 121a, the door main body 141a is rotated about the hinge part toward the inside of the cleaner station 100, such that the dust passage hole 121a may be opened. Meanwhile, when the door arm 143 pushes the door main body 141a in the state in which the dust passage hole 121a is opened, the door main body 141a is rotated about the hinge part 141b toward the outside of the cleaner station 100, such that the dust passage hole 121a may be closed.

[0194] Meanwhile, the door 141 may be in contact with the discharge cover 222 in the state in which the cleaner 200 is coupled to the cleaner station 100 and the discharge cover 222 is separated from the dust bin main body 210. Further, when the door 141 rotates, the discharge cover 222 may rotate in conjunction with the door 141.

[0195] The door motor 142 may provide power for rotating the door 141. Specifically, the door motor 142 may rotate the door arm 143 in a forward or reverse direction. In this case, the forward direction may mean a direction in which the door arm 143 pulls the door 141. Therefore, when the door arm 143 is rotated in the forward direction, the dust passage hole 121a may be opened. In addition, the reverse direction may mean a direction in which the door arm 143 pushes the door 141. Therefore, when the door arm 143 is rotated in the reverse direction, at least a part of the dust passage hole 121a may be closed. The forward direction may be opposite to the reverse direction.

[0196] The door arm 143 may connect the door 141 and the door motor 142 and open or close the door 141 using the power generated from the door motor 142.

[0197] For example, the door arm 143 may include a first door arm 143a and the second door arm 143b. One end of the first door arm 143a may be coupled to the door

motor 142. The first door arm 143a may be rotated by the power of the door motor 142. The other end of the first door arm 143a may be rotatably coupled to the second door arm 143b. The first door arm 143a may transmit a force transmitted from the door motor 142 to the second door arm 143b. One end of the second door arm 143b may be coupled to the first door arm 143a. The other end of the second door arm 143b may be coupled to the door 141. The second door arm 143b may open or close the dust passage hole 121a by pushing or pulling the door 141.

[0198] The door unit 140 may further include door opening/closing detecting parts 144. The door opening/closing detecting parts 144 may be provided in the housing 110 and may detect whether the door 141 is in an opened state.

[0199] For example, the door opening/closing detecting parts 144 may be disposed at both ends in a rotational region of the door arm 143, respectively. As another example, the door opening/closing detecting parts 144 may be disposed at both ends in a movement region of the door 141, respectively.

[0200] Therefore, when the door arm 143 is moved to a preset door opening position DP1 or when the door 141 is opened to a predetermined position, the door opening/closing detecting parts 144 may detect that the door is opened. In addition, when the door arm 143 is moved to a preset door closing position DP2 or when the door 141 is opened to a predetermined position, the door opening/closing detecting parts 144 may detect that the door is opened.

[0201] The door opening/closing detecting part 144 may include a contact sensor. For example, the door opening/closing detecting part 144 may include a micro-switch.

[0202] Meanwhile, the door opening/closing detecting part 144 may also include a contactless sensor. For example, the door opening/closing detecting part 144 may include an infrared ray (IR) sensor.

[0203] With this configuration, the door unit 140 may selectively open or close at least a part of the coupling surface 121, thereby allowing the outside of the first outer wall surface 112a to communicate with the flow path part 180 and/or the dust collecting part 170.

[0204] The door unit 140 may be opened when the discharge cover 222 of the cleaner 200 is opened. In addition, when the door unit 140 is closed, the discharge cover 222 of the cleaner 200 may also be closed in conjunction with the door unit 140.

[0205] When the dust in the dust bin 220 of the cleaner 200 is removed, the door motor 142 may rotate the door 141, thereby coupling the discharge cover 222 to the dust bin main body 221. Specifically, the door motor 142 may rotate the door 141 to rotate the door 141 about the hinge part 141b, and the door 141 rotated about the hinge part 141b may push the discharge cover 222 toward the dust bin main body 221.

[0206] The cover opening unit 150 according to the

present disclosure will be described below with reference to FIG. 9.

[0207] The cleaner station 100 according to the present disclosure may include the cover opening unit 150. The cover opening unit 150 may be disposed on the coupling part 120 and may open the discharge cover 222 of the cleaner 200.

[0208] The cover opening unit 150 may include the push protrusion 151, a cover opening motor 152, cover opening gears 153, a support plate 154, and the gear box 155.

[0209] The push protrusion 151 may move to press the coupling lever 222c when the cleaner 200 is coupled.

[0210] The push protrusion 151 may be disposed on the dust bin guide surface 122. Specifically, the protrusion moving hole may be formed in the dust bin guide surface 122, and the push protrusion 151 may be exposed to the outside by passing through the protrusion moving hole.

[0211] When the cleaner 200 is coupled, the push protrusion 151 may be disposed at a position at which the push protrusion 151 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 151.

[0212] The push protrusion 151 may rectilinearly reciprocate to press the coupling lever 222c. Specifically, the push protrusion 151 may be coupled to the gear box 155, such that the rectilinear movement of the push protrusion 151 may be guided. The push protrusion 151 may be coupled to the cover opening gears 153 and moved together with the cover opening gears 153 by the movements of the cover opening gears 153.

[0213] The cover opening motor 152 may provide power for moving the push protrusion 151. Specifically, the cover opening motor 152 may rotate a motor shaft (not illustrated) in a forward direction or a reverse direction. In this case, the forward direction may mean a direction in which the push protrusion 151 pushes the coupling lever 222c. In addition, the reverse direction may mean a direction in which the push protrusion 151, which has pushed the coupling lever 222c, returns back to an original position. The forward direction may be opposite to the reverse direction.

[0214] The cover opening gears 153 may be coupled to the cover opening motor 152 and may move the push protrusion 151 using the power from the cover opening motor 152. Specifically, the cover opening gears 153 may be accommodated in the gear box 155. A driving gear 153a of the cover opening gears 153 may be coupled to the motor shaft of the cover opening motor 152 and supplied with the power. A driven gear 153b of the cover opening gears 153 may be coupled to the push protrusion 151 to move the push protrusion 151. For example, the driven gear 153b may be provided in the form of a rack gear, engage with the driving gear 153a, and receive power from the driving gear 153a.

[0215] In this case, the discharge cover 222 may have the torsion spring 222d. The discharge cover 222 may be rotated by a predetermined angle or more and supported in the rotated position by an elastic force of the torsion spring 222d. Therefore, the discharge cover 222 may be opened, and the dust passage hole 121a and the inside of the dust bin 220 may communicate with each other.

[0216] The gear box 155 may be disposed in the housing 110 and disposed at the lower side of the coupling part 120 in the gravitational direction, and the cover opening gears 153 may be accommodated in the gear box 155.

[0217] Cover opening detecting parts 155f may be disposed on the gear box 155. In this case, the cover opening detecting part 155f may include a contact sensor. For example, the cover opening detecting part 155f may include a micro-switch. Meanwhile, the cover opening detecting part 155f may also include a contactless sensor. For example, the cover opening detecting part 155f may include an infrared (IR) sensor.

[0218] The cover opening detecting part 155f may be disposed on at least one of inner and outer walls of the gear box 155. For example, the single cover opening detecting part 155f may be disposed on the inner surface of the gear box 155. In this case, the cover opening detecting part 155f may detect that the push protrusion 151 is positioned at the initial position.

[0219] Accordingly, according to the present disclosure, the cover opening unit 150 may open the dust bin 220 even though the user separately opens the discharge cover 222 of the cleaner, and as a result, it is possible to improve convenience.

[0220] In addition, since the discharge cover 222 is opened in the state in which the cleaner 200 is coupled to the cleaner station 100, it is possible to prevent the dust from scattering.

[0221] FIGS. 12 to 18 are views for explaining the configuration and arrangement of the dust collecting part in the cleaner station according to the embodiment of the present disclosure.

[0222] Meanwhile, the dust collecting part 170 will be described below with reference to FIGS. 10 to 18.

[0223] The cleaner station 100 may include the dust collecting part 170. The dust collecting part 170 may be disposed in the housing 110. The dust collecting part 170 may be disposed in the bag accommodation space. The dust collecting part 170 may be disposed to correspond to a position of a dust collecting part entrance hole 112e.

[0224] That is, the dust collecting part entrance hole 112e may be formed in the outer wall surface 112. In this case, the dust collecting part entrance hole 112e may have a size larger than a height of the dust collecting part 170 in the upward/downward direction and a width of the dust collecting part 170 in the leftward/rightward direction. Therefore, the components of the dust collecting part 170 may be attached to or detached from the housing 110 through the dust collecting part entrance hole 112e. Of course, the entire dust collecting part 170 may be attached to or detached from the housing 110 through the

dust collecting part entrance hole 112e.

[0225] Meanwhile, the dust collecting part entrance hole 112e may be opened or closed by a dust collecting part door 112f. For example, the dust collecting part door 112f may be hingedly coupled to the outer wall surface 112. With this configuration, the user may open the dust collecting part door 112f and attach or detach the dust collecting part 170 through the dust collecting part entrance hole 112e.

[0226] Therefore, the dust collecting part 170 in a direction that traverses a longitudinal direction of the housing 110. In other words, the user may attach or detach the dust collecting part 170 in a direction that traverses a longitudinal direction of the cleaner station 100.

[0227] Therefore, according to the present disclosure, the user may attach or detach the dust collecting part 170 to or from the housing 110 by performing a simple operation of pulling or pushing the dust collecting part 170 in a direction parallel to the ground surface.

[0228] The dust collecting part 170 may be disposed above the dust collecting motor 191 based on the gravitational direction. In addition, the dust collecting part 170 may be disposed at the lower side of the coupling part 120 based on the gravitational direction.

[0229] The dust collecting part 170 may capture the dust in the dust bin 220 of the cleaner 200. Specifically, when the dust collecting motor 191 operates in the state in which the cleaner 200 is coupled to the cleaner station 100 and the inside of the dust bin 220 communicates with the flow path part 180, the dust in the dust bin 220 may flow along the flow path part 180 and be captured in the dust collecting part 170.

[0230] Meanwhile, in the case of the general cleaner station, because the air from which dust is not separated is captured in the dust bag, a part of the dust may be introduced into the dust collecting motor. Therefore, the dust collecting motor may be broken down by dust introduced into the dust collecting motor.

[0231] In order to solve this problem, a prefilter or the like may be disposed in a flow path. However, in case that only the prefilter is used to filter out dust, the prefilter may be clogged by dust, and there is a limitation in that a suction force of the dust collecting motor decreases.

[0232] In order to solve this problem, the dust collecting part 170 of the cleaner station 100 of the present disclosure includes the dust separating part 171 to separate dust from air, which is introduced through the flow path part 180, and capture the dust.

[0233] Specifically, the dust collecting part 170 may include the dust separating part 171, the dust bag 172, the bag support part 173, the dust bag cartridge 174, a prefilter 175, and the joining device 176.

[0234] The dust separating part 171 may separate dust from the air introduced from the dust bin 220.

[0235] The dust separating part 171 may be disposed above the dust bag 172, the bag support part 173, the dust bag cartridge 174, and the joining device 176. That

is, the dust bag cartridge 174, the bag support part 173, the dust bag cartridge 174, and the joining device 176 may be disposed below the dust separating part 171. The dust separating part 171 may be in contact with the dust bag cartridge 174.

[0236] The dust separating part 171 may be disposed on the longitudinal axis C of the cleaner station 300.

[0237] The dust separating part 171 may include a dust separating part casing 171a.

[0238] The dust separating part casing 171a may define an external appearance of the dust separating part 171.

[0239] A cyclone part may be provided in the dust separating part casing 171a. That is, a cyclone part 171b may be disposed in the dust separating part casing 171a.

[0240] In addition, a dust passage tube 171c may be formed in the dust separating part casing 171a. For example, a flow path, through which dust may pass, may be formed in a lower surface of the dust separating part casing 171a.

[0241] A lower surface of the dust separating part 171 may be inclined at a predetermined angle with respect to the ground surface. That is, the lower surface of the dust separating part casing 171a may be inclined at a predetermined angle with respect to the ground surface. The lower surface of the dust separating part 171 may have a height from the ground surface that gradually decreases from one side toward the other side. For example, the dust separating part casing 171a may have a height from the ground surface that gradually decreases rearward from a front end into which the dust bag cartridge 174 is inserted.

[0242] A sealer, which is in contact with the dust bag cartridge 174, may be provided on the lower surface of the dust separating part casing 171a. For example, the sealer may be disposed in a quadrangular shape that surrounds an outer periphery of the dust passage tube 171c.

[0243] The dust separating part 171 may communicate with the first flow path 181. The dust separating part 171 may separate the dust sucked through the first flow path 181. A space in the dust separating part 171 may communicate with an internal space of the dust bag cartridge 174. The space in the dust separating part 171 may communicate with a space in the bag support part 173.

[0244] The dust separating part 171 may have one or more cyclone parts 171b capable of separating dust by using a cyclone flow. Therefore, air and dust, which are introduced through the first flow path 181, spirally flow along an inner circumferential surface of the dust separating part 171. Therefore, the cyclone flow may be generated in an internal space of the dust separating part 171.

[0245] The cyclone part 171b may be detachably coupled to the dust separating part casing 171a.

[0246] Meanwhile, in the present embodiment, the cyclone part 171b may have a cylindrical mesh. In this

case, an axial direction of the mesh may be disposed in parallel with the ground surface. That is, the cyclone part 171b may be disposed in the direction intersecting the longitudinal direction of the housing 110.

[0247] With this configuration, when the cyclone part 171b is pulled from the lateral side of the cleaner station 100, the cyclone part 171b may be separated from the dust collecting part 170. That is, in the present disclosure, the cyclone part 171b may be attached to or detached from the dust separating part casing 171a in the direction that traverses the longitudinal direction of the housing 110.

[0248] Therefore, according to the present embodiment, the user may easily separate the cyclone part 171b and wash the mesh.

[0249] In addition, the dust separating part 171 may include the dust passage tube 171c configured to guide the dust, which is separated by the cyclone part 171b, to the dust bag 172. The dust passage tube 171c may be formed to be directed downward from one side of the cyclone part 171b based on the axial direction. That is, the dust passage tube 171c may be formed at a lower side of the dust separating part casing 171a. Therefore, a flow path formed in the dust passage tube 171c may allow the internal spaces of the dust bag cartridge 174 and the bag support part 173 to communicate with the cyclone part 171b.

[0250] The dust separating part 171 may further include a secondary cyclone part configured to separate again dust from the air discharged from the cyclone part. In this case, the secondary cyclone part may be positioned in the cyclone part to minimize a size of the dust separating part 171.

[0251] The dust separating part 171 communicates with the first flow path 181. The dust separating part 171 adopts a principle of a dust collector using a centrifugal force to separate the dust introduced into the housing 110 through the dust passage hole 121a.

[0252] The dust bag 172 may be disposed in the housing 110. The dust bag 172 may be disposed below the dust separating part 171 based on the gravitational direction.

[0253] The dust bag 172 may be made of an impermeable material. For example, the dust bag 172 may include a roll vinyl film (not illustrated). With this configuration, the dust bag 172 is sealed or joined, which may prevent dust or offensive odor captured in the dust bag 172 from leaking to the outside from the dust bag 172.

[0254] The dust bag 172 may be mounted in the housing 110 by means of the dust bag cartridge 174. As necessary, the dust bag 172 may be replaced by means of the dust bag cartridge 174. That is, the dust bag 172 may be defined as a consumable component. A volume of the dust bag 172 may be increased by the suction force (negative pressure), which is generated when the dust collecting motor 191 operates, in the state in which the dust bag 172 is mounted in the housing 110.

[0255] In this case, the dust bag 172 in the spread state

may be accommodated in the bag support part 173. That is, the dust bag 172 may expand in the bag support part 173 when the dust collecting motor 191 operates. Further, the dust bag 172 in the spread state is supported by the bag support part 173, such that a shape of the dust bag 172 may be maintained.

[0256] The dust bag 172 may store the dust separated by the dust separating part 171. An upper region of the dust bag 172 may be cut and joined by the joining device 176. In the state in which the upper region of the dust bag 172 is cut and joined, the dust bag 172 may be separated from the bag support part 173.

[0257] With this configuration, the user need not separately tie a bag in which dust is captured, such that the user convenience may be improved.

[0258] Meanwhile, in the case of the general roll vinyl type dust bag, the dust bag may be pulled toward the dust collecting motor and squashed flat when the dust collecting motor operates. Therefore, when the dust collecting motor operates, an internal space of the dust bag is narrowed, which makes it difficult to capture the dust in the dust bag.

[0259] In order to cope with this difficulty, the dust collecting part 170 of the cleaner station 100 according to the embodiment of the present disclosure may further include the bag support part 173 to allow the dust bag to be stably unfolded.

[0260] The bag support part 173 may support the dust bag 172. In case that the dust bag 172 expands, the bag support part 173 may accommodate the dust bag 172 therein. The bag support part 173 may support an external shape of the expanded dust bag 172.

[0261] The bag support part 173 may be disposed below the dust separating part 171. With this configuration, the dust separated by the dust separating part 171 may be captured in the bag support part 173.

[0262] The bag support part 173 may be disposed below the dust bag cartridge 174. With this configuration, when the dust bag 172 expands downward from the dust bag cartridge 174, at least a part of the dust bag 172 may be accommodated in the bag support part 173.

[0263] The bag support part 173 may be disposed below the joining device 176. With this configuration, the expanded dust bag 172 may be joined by the joining device 176, the dust bag 172 may be separated, and then the dust bag 172 may be dropped downward by gravity and accommodated in the bag support part 173.

[0264] Specifically, the bag support part 173 may include a support part main body 173a, a suction hole 173b, and a bag passage hole 173c.

[0265] A space may be defined between a lower surface of the support part main body 173a and a lower surface of the bag accommodation space. The space may provide a route along which a suction force of the dust collecting motor 191 is transmitted.

[0266] With this configuration, when the dust collecting motor 191 operates, the air, which is present in the bag accommodation space, may be sucked into the dust

collecting motor 191 by the suction force of the dust collecting motor 191, and a negative pressure, which expands the dust bag 172, may be generated in the bag accommodation space.

[0267] The support part main body 173a may be formed to accommodate the dust bag 172 therein in case that the dust bag 172 expands. For example, the support part main body 173a may be formed in a hexahedral shape, an upper side of the support part main body 173a may be opened, and the bag passage hole 173c may be formed in a front surface of the support part main body 173a. With this configuration, the dust bag 172 may be removed through the bag passage hole 173c.

[0268] At least a part of the dust bag 172 may be disposed at an upper side of the support part main body 173a. Further, in case that the dust bag 172 expands, the dust bag 172 may expand downward and fill an internal space of the support part main body 173a.

[0269] The suction holes 173b may be provided as a plurality of suction holes 173b formed in the support part main body 173a. For example, the plurality of suction holes 173b may be formed along an outer surface of the support part main body 173a. Further, one or more suction holes 173b may be formed in the lower surface of the support part main body 173a.

[0270] With this configuration, when the dust collecting motor 191 operates, the air in the support part main body 173a may flow to the outside of the support part main body 173a through the suction holes 173b. In addition, in the state in which the dust bag 172 is expanded in the support part main body 173a, the negative pressure may be applied to the dust bag 172 toward the outside of the support part main body 173a, and the dust bag 172 may expand to come into close contact with the inner surface and the lower surface of the support part main body 173a. That is, the dust bag 172 may expand along an internal shape of the bag support part 173.

[0271] In particular, when the plurality of suction holes 173b is formed while maintaining predetermined intervals, a uniform negative pressure is applied to the entire dust bag 172, such that the dust bag 172 may be uniformly expanded, and the expanded state may be maintained.

[0272] The bag passage hole 173c may be formed so that the dust bag 172 may pass through the bag passage hole 173c.

[0273] The bag passage hole 173c may be formed in the support part main body 173a. For example, the bag passage hole 173c may be formed in the front surface of the support part main body 173a. That is, the support part main body 173a may be formed in a shape opened at the front side thereof.

[0274] With this configuration, the user may remove the dust bag 172 in the direction that traverses the longitudinal direction of the housing 110. That is, the user may remove the dust bag 172 in the horizontal direction.

[0275] Meanwhile, the bag passage hole 173c may be formed inside the dust collecting part entrance hole 112e.

Therefore, a direction, in which the user removes the dust collecting part 170 from the housing 110, may be consistent with a direction in which the user separates the dust bag 172 from the housing 110.

[0276] Therefore, according to the present disclosure, the user may easily separate the dust collecting part 170 and/or the dust bag 172.

[0277] With this configuration, the user may withdraw the housing 110 to the outside by pulling the dust bag 172 after opening the dust collecting part door 112f of the cleaner station 100. Therefore, according to the present disclosure, the user may easily withdraw and discard the dust bag.

[0278] Meanwhile, in the case of the roll vinyl type cleaner station, the dust bag needs to be replaced when the consumable dust bag is completely consumed. In this case, the user may mount the dust bag by directly fitting the dust bag into the housing of the cleaner station. However, there is a concern that a breakdown occurs during a process in which the user opens the inside of the cleaner station. In addition, in case that the dust bag is erroneously mounted, the dust collecting process is performed in a state in which the dust bag is not unfolded, which may cause a problem in that dust scatters.

[0279] In order to solve the problem, in the present disclosure, the dust bag may be easily supplied by the dust bag cartridge 174 so that the user may replace only the cartridge.

[0280] The dust bag cartridge 174 may be separably coupled to the housing 110 and supply the dust bag 172.

[0281] The dust bag cartridge 174 may be detachably coupled to the housing 110. Specifically, the dust bag cartridge 174 may be detachably coupled to a cartridge coupling space formed between the dust separating part 171 and the joining device 176.

[0282] In this case, in the present disclosure, the cartridge coupling space may have a height that varies in the upward/downward direction. For example, a height of a front side of the cartridge coupling space, through which the dust bag cartridge 174 enters the inside of the cleaner station 100 from the outside, may be larger than a height at a rear side of the cartridge coupling space.

[0283] When the user pulls the dust bag cartridge 174 to the outside of the cleaner station 100 in the state in which the dust bag cartridge 174 is coupled to the housing 110, the dust bag cartridge 174 may be separated from the housing 110.

[0284] With this configuration, the user may attach or detach the dust bag cartridge 174 in the direction that intersects the longitudinal direction of the housing 110.

[0285] Therefore, the user may easily mount or separate the dust bag cartridge 174 in or from the housing.

[0286] The dust bag 172 may be provided in the dust bag cartridge 174. For example, at least a part of the dust bag 172, which is provided in the form of a roll vinyl film, may be coupled to the dust bag cartridge 174. The dust bag 172 may be expanded in the direction toward the bag support part 173 by the operation of the dust collecting

motor 191. In addition, when the joining device 176 to be described below operates, the dust bag 172 may be joined, and a part of the dust bag 172 may be separated from the dust bag cartridge 174. With this configuration, the user need not separately tie a bag in which dust is captured, such that the user convenience may be improved.

[0287] The dust bag cartridge 174 may be disposed below the dust separating part 171. For example, an upper surface of the dust bag cartridge 174 may be in contact with a lower surface of the dust separating part 171.

[0288] The dust bag cartridge 174 may be disposed above the joining device 176. For example, a lower surface of the dust bag cartridge 174 and an upper surface of the joining device 176 may be in contact with each other.

[0289] The dust bag cartridge 174 includes a cartridge casing 174a and a sealer 174b.

[0290] The cartridge casing 174a may define an external appearance of the dust bag cartridge 174, and the dust bag 172 may be accommodated in the cartridge casing 174a. For example, upper and lower casings of the cartridge casing 174a may be coupled to each other to define a space in which the dust bag 172 is accommodated. In this case, in the state in which the upper casing and the lower casing are coupled to each other, the cartridge casing 174a may be formed in a quadrangular tube shape as a whole (see FIG. 16). That is, a space 174f, in which air may flow, may be formed in (at a center of) the cartridge casing 174a. At least a part of the dust bag 172 may be expanded through the space 174f.

[0291] A bag supply hole 174d, through which the dust bag 172 may be withdrawn, may be formed in the cartridge casing 174a. For example, the bag supply hole 174d may be formed in an inner peripheral surface of the cartridge casing 174a. With this configuration, in a state in which the dust bag 172 is withdrawn, the space 174f formed at the center of the cartridge casing 174a may be blocked by the dust bag 172. Therefore, when the dust collecting motor 191 operates, the dust bag 172 may be expanded by being sucked in the direction of the dust collecting motor 191.

[0292] The cartridge casing 174a may have a predetermined height. A height of the cartridge casing 174a is smaller than a height of a front end of the cartridge coupling space. The height of the cartridge casing 174a is equal to a height of a rear end of the cartridge coupling space.

[0293] With this configuration, the cartridge casing 174a may be easily inserted into the front end of the cartridge coupling space. In addition, in the state in which the cartridge casing 174a is coupled to the cartridge coupling space, the cartridge casing 174a may be in contact with and supported on a lower surface of the dust separating part 171 and/or an upper surface of the joining device 176.

[0294] Meanwhile, as described above, in case that a space is present between the dust bag cartridge and the

peripheral structure or in case that the dust bag cartridge is detachably configured, there is a problem in that dust contained in air scatters through a separation space to which the dust bag cartridge is coupled.

[0295] In order to solve the problem, in the cleaner station 100 according to the embodiment of the present disclosure, the dust bag cartridge 174 may have at least one sealer 174b to seal a gap through which dust may scatter.

[0296] That is, the sealers 174b may be provided on the upper and lower surfaces of the cartridge casing 174a. For example, the sealer 174b may be disposed in a quadrangular shape that surrounds an outer periphery thereof based on the space 174f formed at the center of the cartridge casing 174a. The sealer 174b may suppress a leak of foreign substances. With this configuration, the debris separated by the dust separating part 171 may be captured in the dust bag 172 without leaking to the outside.

[0297] The dust collecting part 170 may further include the prefilter 175. The prefilter 175 may be disposed on the second flow path 182 and separate the debris from the air flowing along the second flow path 182. For example, the prefilter 175 may be disposed at an inlet port side of the second flow path 182 and separate the dust contained in the air having passed through the dust separating part 171. With this configuration, it is possible to prevent the debris from being introduced into a dust collecting motor 191.

[0298] The prefilter 175 may be detachably coupled to the second flow path 182. The prefilter 175 may be disposed at the front side of the cleaner station 100 and detachably coupled to the second flow path 182.

[0299] Therefore, the prefilter 175 may be attached or detached in the direction that intersects the longitudinal direction of the housing 110.

[0300] The dust collecting part 170 may further include the joining device 176.

[0301] The joining device 176 may be disposed below the dust bag cartridge 174. For example, the upper surface of the joining device 176 may be in contact with the lower surface of the dust bag cartridge 174. With this configuration, the joining device 176 may guide the attachment or detachment of the dust bag cartridge 174.

[0302] The joining device 176 may be disposed above the bag support part 173. For example, a lower surface of the joining device 176 may be in contact with an upper surface of the bag support part 173.

[0303] The joining device 176 may cut and join an upper region of the dust bag 172 in which dust is captured. Specifically, the joining device 176 may retract the dust bag 172 to a central region and join the upper region of the dust bag 172 by using a heating wire. For example, the joining device 176 may include a first joining member (not illustrated) and a second joining member (not illustrated). The first joining member (not illustrated) may be moved in a first direction by a first joining drive part, and the second joining member (not illustrated) may be

moved in a second direction perpendicular to the first direction by a second joining drive part.

[0304] With this configuration, the dust captured from the outside may be collected in the roll vinyl film, and the roll vinyl film may be automatically joined. Therefore, it is not necessary for the user to separately tie a bag in which the dust is captured, and as a result, it is possible to improve convenience for the user.

[0305] The joining device 176 includes a joining device casing 176a, a sealer 176b, and a cartridge detection sensor 176c.

[0306] The joining device casing 176a defines an external appearance of the joining device. The joining device casing 176a may be disposed in the housing 110. For example, the joining device casing 176a may be fixedly coupled to the housing 110.

[0307] An upper surface of the joining device 176 may be inclined at a predetermined angle with respect to the ground surface. That is, an upper surface of the joining device casing 176a may be inclined at a predetermined angle with respect to the ground surface. Specifically, the upper surface of the joining device 176 may have a height from the ground surface that gradually increases from one side toward the other side. For example, the upper surface of the joining device casing 176a may have a height from the ground surface that gradually increases rearward from a front end into which the dust bag cartridge 174 is inserted.

[0308] With this configuration, an inlet of the cartridge coupling space, into which the dust bag cartridge 174 is inserted, may be formed to be large. In case that the dust bag cartridge 174 is completely inserted into the cartridge coupling space, the joining device 176 may support the dust bag cartridge 174.

[0309] The sealer 176b, which is in contact with the dust bag cartridge 174, may be disposed on the upper surface of the joining device casing 176a. For example, the sealer 176b may be disposed in a quadrangular shape that surrounds an outer periphery thereof based on the flow path part 180. The sealer 176b may prevent a leak of foreign substances between the joining device 176 and the dust bag cartridge 174.

[0310] Meanwhile, in case that the dust bag cartridge 174 is not mounted at an accurate position in the housing 110, the sealing made by the sealer may not be implemented. When the dust collecting motor 191 operates in this situation, a large amount of dust may scatter, which may cause a breakdown of the component in the cleaner station 100.

[0311] That is, it is necessary to prevent the dust bag cartridge 174 from being erroneously mounted and detect whether the dust bag cartridge 174 is mounted accurately.

[0312] To this end, the cleaner station 100 according to the embodiment of the present disclosure further include the cartridge detection sensor 176c.

[0313] The cartridge detection sensor 176c may be disposed on the upper surface of the joining device

casing 176a. For example, the upper surface of the joining device casing 176a may include a front upper surface, a rear upper surface, a left upper surface, and a right upper surface. In this case, the front upper surface may mean a surface of the upper surface disposed at the front side of the cleaner station into which the dust bag cartridge is inserted, the rear upper surface may mean a surface of the upper surface disposed at the rear side of the cleaner station, the left upper surface may mean a surface of the upper surface disposed at the left side of the cleaner station, and the right upper surface may mean a surface of the upper surface disposed at the right side of the cleaner station.

[0314] In this case, the cartridge detection sensors 176c may be disposed on the left upper surface or the right upper surface of the joining device casing 176a. In addition, the cartridge detection sensor 176c may be disposed at a middle position of the cleaner station 100 based on the forward/rearward direction. In addition, the cartridge detection sensor 176c may be disposed outward of the sealer 176b.

[0315] With this configuration, the cartridge detection sensor 176c may be disposed without interfering with the movement routes of the first joining member (not illustrated) and the second joining member (not illustrated).

[0316] The cartridge detection sensor 176c may detect whether the dust bag cartridge 174 is coupled. In this case, the cartridge detection sensor 176c may include a contact sensor. For example, the cartridge detection sensor 176c may include a micro-switch.

[0317] With this configuration, when the dust bag cartridge 174 is inserted into the cartridge coupling space, the cartridge detection sensor 176c and the dust bag cartridge 174 may come into contact with each other, and the cartridge detection sensor 176c may detect that the dust bag cartridge 174 is coupled.

[0318] Meanwhile, although not illustrated, the dust collecting part 170 may further include a dust amount sensor (not illustrated). The dust amount sensor may measure the amount of dust in the dust bag 172.

[0319] As a result, according to the present disclosure, the dust collecting part 170 may be coupled and separated in the direction intersecting the longitudinal direction of the housing 110. The cyclone part 171b, the dust bag 172, and the dust bag cartridge 174 may also be coupled and separated in the same direction.

[0320] The cleaner station 100 may include the flow path part 180. The flow path part 180 may connect the cleaner 200, the dust collecting part 170, and the dust collecting motor 191.

[0321] The flow path part 180 may include the first flow path 181, the second flow path 182, and the bypass flow path (not illustrated).

[0322] The first flow path 181 may connect the dust bin 220 of the cleaner 200 and the dust collecting part 170. The first flow path 181 may be disposed at a rear side of the coupling surface 121. The first flow path 181 may mean a space between the dust bin 220 of the cleaner

200 and the dust collecting part 170. The first flow path 181 may be a space formed at a rear side of the dust passage hole 121a. The first flow path 181 may be a flow path directed downward from the dust passage hole 121a, and the dust and the air may flow through the first flow path 181.

[0323] For example, the first flow path 181 may include a first region 181a configured to communicate with the internal space of the dust bin 220 when the cleaner 200 is coupled to the cleaner station 100 and the dust passage hole 121a is opened, and a second region 181b configured to allow the first region 181a and the bag accommodation space (or the internal space of the dust collecting part 170) to communicate with each other. In this case, a direction in which the first region 181a is formed may be disposed substantially in parallel with the axial direction (longitudinal direction) of the dust bin. In addition, a direction in which the second region 181b is formed may be disposed in parallel with the longitudinal axis C of the housing 110. In this case, the first region 181a may be formed to have a predetermined angle with respect to the second region 181b. With this configuration, it is possible to minimize a decrease in suction force of the dust collecting motor 191 in the first flow path 181 and the second flow path 182.

[0324] Therefore, when the dust collecting motor 191 operates, the dust in the dust bin 220 of the cleaner 200 may flow to the dust collecting part 170 through the first flow path 181.

[0325] The second flow path 182 may connect the dust collecting part 170 and the dust suction module 190. Specifically, the second flow path 182 may be a flow path that connects the upper side of the dust collecting part 170 and the upper side of the dust suction module 190.

[0326] With this configuration, it is possible to guide the air, which has passed through the dust collecting part 170, to the dust collecting motor 191 through the second flow path 182.

[0327] The bypass flow path (not illustrated) may connect the bag support part 173 and the dust collecting motor 191 by means of the flow path.

[0328] The bypass flow path (not illustrated) may allow the bag accommodation space and the internal space of the dust suction module 190 to communicate with each other. For example, the bypass flow path may be a flow path formed in the gravitational direction to connect the bag accommodation space and the dust suction module 190. With this configuration, the bypass flow path may guide the air, which is present in the bag accommodation space, to the dust collecting motor 191.

[0329] The second flow path 182 and the bypass flow path (not illustrated) may communicate with each other and be connected to the dust suction module 190. For example, the second flow path 182 may be connected to the bypass flow path (not illustrated), and the bypass flow path (not illustrated) may be connected to the dust suction module 190. As another example, the bypass flow path (not illustrated) may be connected to the second flow

path 182, and the second flow path 182 may be connected to the dust suction module 190. Therefore, the second flow path 182 and the bypass flow path (not illustrated) may be respectively connected to the dust collecting part 170 and the dust collecting motor 191 by means of the flow paths.

[0330] With this configuration, the operation of the dust collecting motor 191 may simultaneously maintain the shape of the dust bag 172 and suck outside air.

[0331] The cleaner station 100 may include the dust suction module 190. The dust suction module 190 may include the dust collecting motor 191.

[0332] The dust collecting motor 191 may be disposed below the dust collecting part 170. The dust collecting motor 191 may generate a suction force in the flow path part 180. Therefore, the dust collecting motor 191 may provide a suction force capable of sucking the dust in the dust bin 220 of the cleaner 200.

[0333] The dust collecting motor 191 may generate the suction force by means of the rotation. For example, the dust collecting motor 191 may be formed in a shape similar to a cylindrical shape and generate a suction force while rotating about a rotation axis. In this case, a direction of the rotation axis of the dust collecting motor 191 may be disposed to be perpendicular to the ground surface.

[0334] Meanwhile, FIG. 19 is a block diagram for explaining a control configuration of the cleaner station according to the embodiment of the present disclosure.

[0335] The control configuration of the cleaner station 100 of the present disclosure will be described below with reference to FIG. 19.

[0336] The cleaner station 100 according to the embodiment of the present disclosure may further include a control unit 400 configured to control the coupling part 120, the fixing unit 130, the door unit 140, the cover opening unit 150, the dust collecting part 170, the flow path part 180, and the dust suction module 190.

[0337] The control unit 400 may include a printed circuit board and elements mounted on the printed circuit board.

[0338] When the coupling sensor 125 detects the coupling of the cleaner 200, the coupling sensor 125 may transmit a signal indicating that the cleaner 200 is coupled to the coupling part 120. In this case, the control unit 400 may receive the signal from the coupling sensor 125 and determine that the cleaner 200 is coupled to the coupling part 120.

[0339] In addition, when the charging part 128 supplies power to the battery 240 of the cleaner 200, the control unit 400 may determine that the cleaner 200 is coupled to the coupling part 120.

[0340] When the control unit 400 determines that the cleaner 200 is coupled to the coupling part 120, the control unit 400 may operate the fixing part motor 133 to fix the cleaner 200.

[0341] When the fixing members 131 or the fixing part links 135 are moved to a predetermined fixing point FP1, a fixing detecting part 137 may transmit a signal indicat-

ing that the cleaner 200 is fixed. The station control unit 400 may receive the signal, which indicates that the cleaner 200 is fixed, from the fixing detecting part 137, and determine that the cleaner 200 is fixed. When the control unit 400 determines that the cleaner 200 is fixed, the control unit 400 may stop the operation of the fixing part motor 133.

[0342] Meanwhile, when the operation of emptying the dust bin 220 is ended, the control unit 400 may rotate the fixing part motor 133 in the reverse direction to release the cleaner 200.

[0343] When the control unit 400 determines that the cleaner 200 is fixed to the coupling part 120, the control unit 400 may operate the door motor 142 to open the door 141 of the cleaner station 100.

[0344] When the door 141 or the door arm 143 reaches the predetermined opening position DP1, the door opening/closing detecting part 144 may transmit a signal indicating that the door 141 is opened. The control unit 400 may receive the signal, which indicates that the door 141 is opened, from the door opening/closing detecting part 137 and determine that the door 141 is opened. When the control unit 400 determines that the door 141 is opened, the control unit 400 may stop the operation of the door motor 142.

[0345] Meanwhile, when the operation of emptying the dust bin 220 is ended, the control unit 400 may rotate the door motor 142 in the reverse direction to close the door 141.

[0346] When the control unit 400 determines that the door 141 is opened, the control unit 400 may operate the cover opening motor 152 to open the discharge cover 222 of the cleaner 200.

[0347] When a guide frame 351e reaches the predetermined opening position CP1, the cover opening detecting part 155f may transmit a signal indicating that the discharge cover 222 is opened. The control unit 400 may receive the signal, which indicates that the discharge cover 222 is opened, from the cover opening detecting part 155f and determine that the discharge cover 222 is opened. When the control unit 400 determines that the discharge cover 222 is opened, the control unit 400 may stop the operation of the cover opening motor 152.

[0348] The control unit 400 may operate the joining device 176 to join the dust bag 172. For example, the control unit 400 may operate and move the first joining member in the first direction, and the control unit 400 may operate and move the second joining member in the second direction perpendicular to the first direction.

[0349] Meanwhile, in the present embodiment, the control unit 400 may operate the joining device 176 after the operation of the dust collecting motor 191 is ended. For example, the control unit 400 may operate the joining device 176 when a preset predetermined time elapses after the operation of the dust collecting motor 191 is ended. As another example, the control unit 400 may operate the joining device 176 when a predetermined time elapses after the dust collecting motor 191 operates

a preset number of times. As still another example, the control unit 400 may operate the joining device 176 for each preset cycle. In case that the dust collecting motor 191 is operating, the control unit 400 may operate the joining device 176 when a predetermined time elapses. In addition, the control unit 400 may operate the joining device 176 when the amount of dust measured by the dust amount sensor (not illustrated) exceeds a predetermined reference.

[0350] With this configuration, it is possible to improve hygiene by sealing the dust bag 172 in a state in which the dust is settled in the dust bag 172 without floating in the cleaner station 100.

[0351] Meanwhile, in the present embodiment, the control unit 400 may use the cartridge detection sensor 176c to determine whether the dust bag cartridge 174 is mounted. When the cartridge detection sensor 176c comes into contact with the dust bag cartridge 174, the cartridge detection sensor 176c may transfer information on the contact to the control unit 400. In this case, the control unit 400 may perform control so that the dust collecting motor 191 may operate only in case that the dust bag cartridge 174 is mounted.

[0352] With this configuration, the control unit 400 may allow the dust bin 220 to collect dust only in the state in which the dust bag 172 is provided in the cleaner station 100. Therefore, it is possible to prevent the dust collecting process from being performed in the state in which the dust bag 172 is not provided, which may prevent foreign substances from contaminating the inside of the cleaner station 100 and prevent a breakdown of the cleaner station 100 caused by the foreign substances.

[0353] The control unit 400 may operate the dust collecting motor 191 to suck the dust in the dust bin 220.

[0354] The control unit 400 may operate a display part 410 to display a dust bin emptied situation and a charged situation of the cleaner 200. For example, in the present embodiment, in case that the amount of dust measured by the dust amount sensor exceeds a predetermined reference value, the control unit 400 may display information, which indicates that the dust bag 172 is required to be replaced, on the display part 410.

[0355] Meanwhile, the cleaner station 100 according to the present disclosure may include the display part 410.

[0356] The display part 410 may be disposed on the housing 110, disposed on a separate display device, or disposed on a terminal such as a mobile phone.

[0357] The display part 410 may be configured to include at least any one of a display panel capable of outputting letters and/or figures and a speaker capable of outputting voice signals and sound. The user may easily ascertain a situation of a currently performed process, a residual time, and the like on the basis of information outputted through the display part.

[0358] Meanwhile, the cleaner station 100 according to the embodiment of the present disclosure may include a memory 430. The memory 430 may include various data for operating or driving the cleaner station 100.

[0359] Meanwhile, the cleaner station 100 according to the embodiment of the present disclosure may include an input part 440. The input part 440 generates key input data inputted by the user to control the operation of the cleaner station 100. To this end, the input part 440 may include a keypad, a dome switch, a touchpad (resistive touchpad/capacitive touchpad), and the like. In particular, in case that the touchpad defines a mutual layer structure together with the display part 410, the touchpad may be called a touch screen.

[0360] 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.

[0361] 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;
a coupling part disposed in the housing and configured such that at least a part of a cleaner is coupled to the coupling part;
a dust collecting part accommodated in the housing, disposed at a lower side of the coupling part, and configured to capture dust in a dust bin of the cleaner; and
a dust collecting motor accommodated in the housing, disposed below the dust collecting part, and configured to generate a suction force for sucking dust in the dust bin,
wherein the dust collecting part comprises:

a dust separating part configured to separate dust in air introduced from the dust bin;
a dust bag configured to store the dust separated by the dust separating part;
a bag support part configured to accommodate the dust bag; and
a dust bag cartridge separably coupled to a lower side of the dust separating part and configured to supply the dust bag, and
wherein the dust collecting part is detachably coupled to the housing.

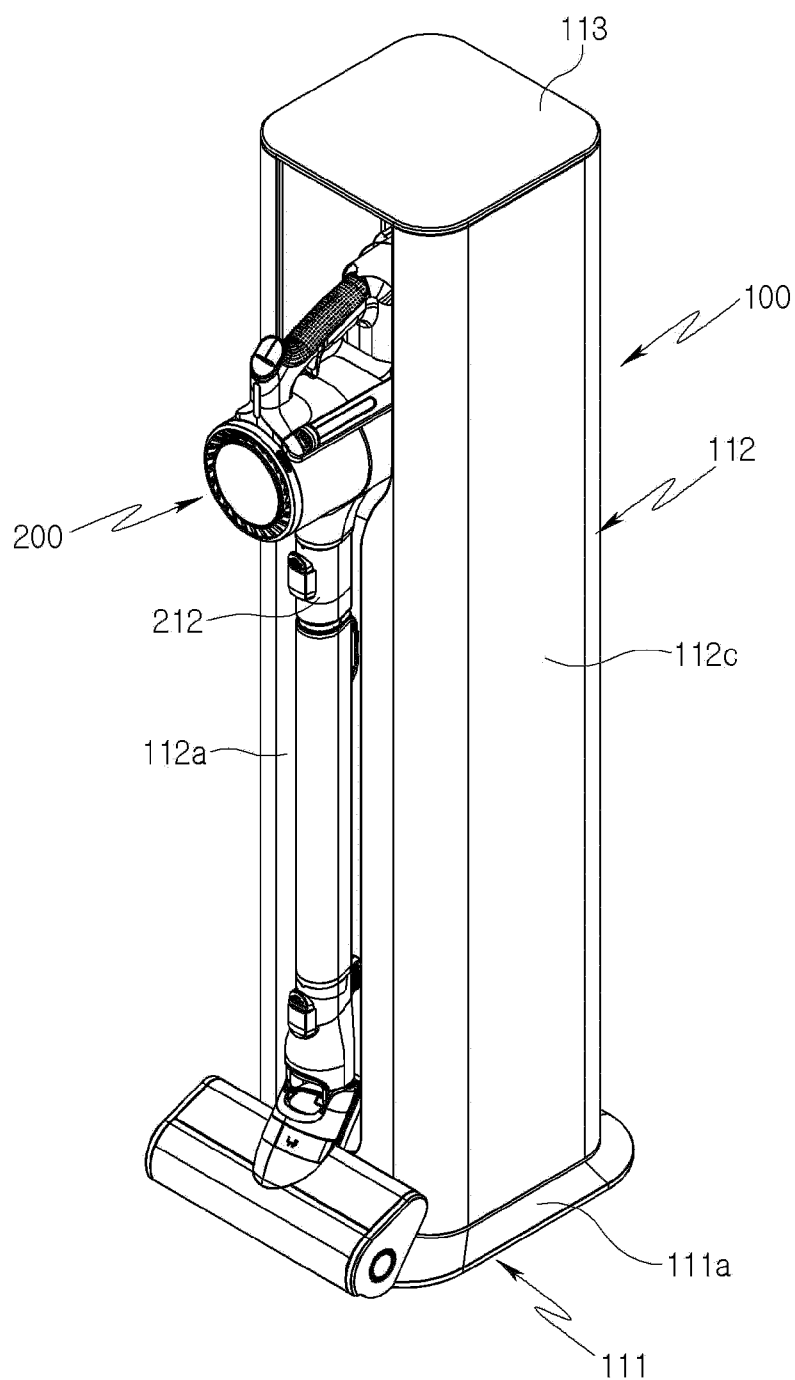
2. The cleaner station of claim 1, wherein the dust collecting part is attached to or detached from the housing in a direction that traverses a longitudinal direction of the housing.

3. The cleaner station of claim 1, wherein the dust separating part comprises:
- a dust separating part casing; and
 - a cyclone part coupled to the dust separating part casing and configured to separate dust from air, and
 - wherein the cyclone part is detachably coupled to the dust separating part casing.
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4. The cleaner station of claim 3, wherein the cyclone part is attached to or detached from the dust separating part casing in a direction that traverses a longitudinal direction of the housing.
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5. The cleaner station of claim 1, wherein the dust bag is separated from the bag support part in a direction that traverses a longitudinal direction of the housing.
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6. The cleaner station of claim 1, wherein the bag support part has a bag passage hole through which the dust bag passes in a direction that traverses a longitudinal direction of the housing.
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7. The cleaner station of claim 1, wherein the dust bag cartridge is separated between the dust separating part and the joining device in a direction that traverses a longitudinal direction of the housing.
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8. The cleaner station of claim 1, wherein the dust collecting part further comprises a prefilter configured to separate dust from air passing through the dust separating part, and
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- wherein the prefilter is separated in a direction that traverses a longitudinal direction of the housing.
9. The cleaner station of claim 1, wherein the housing comprises:
- a bottom surface disposed to face a ground surface; and
 - an outer wall surface disposed in a direction that traverses the bottom surface, and
 - wherein a dust collecting part entrance hole, through which the dust collecting part enters or exits, is formed in the outer wall surface.
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10. A cleaner station comprising:
- a housing;
 - a coupling part disposed in the housing and configured such that at least a part of a cleaner is coupled to the coupling part;
 - a dust collecting part accommodated in the housing, disposed at a lower side of the coupling part, and configured to capture dust in a dust bin of the cleaner; and
 - a dust collecting motor accommodated in the
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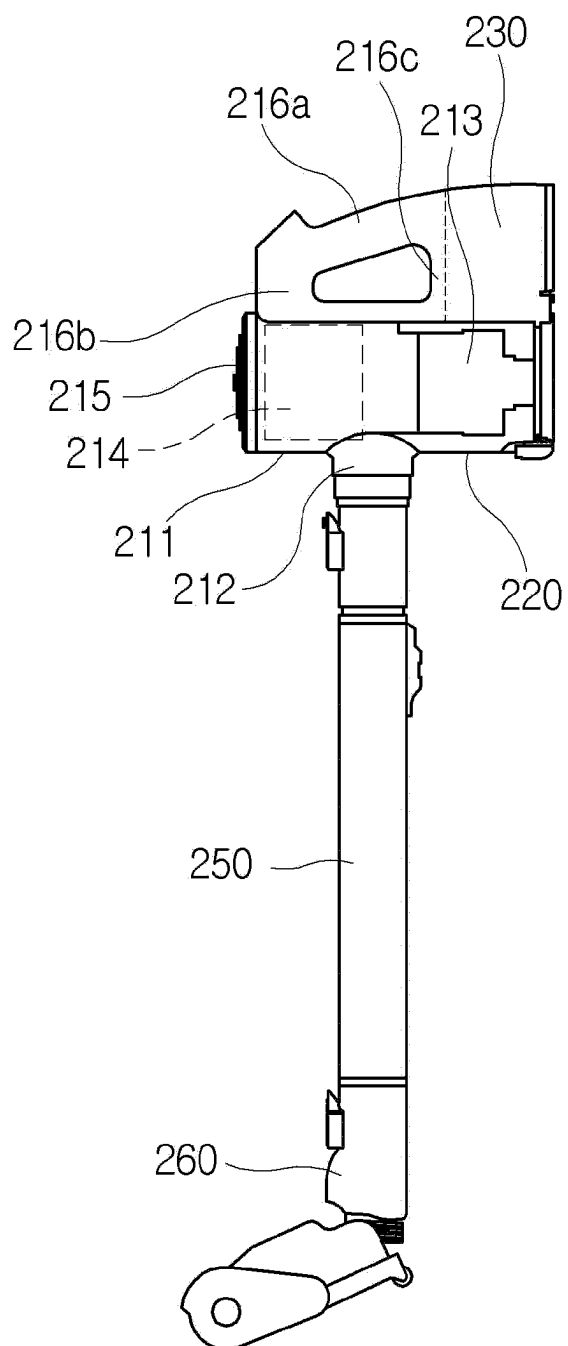
housing, disposed below the dust collecting part, and configured to generate a suction force for sucking dust in the dust bin, wherein the dust collecting part comprises:

- a dust separating part comprising a cyclone part configured to separate dust from air introduced from the dust bin;
- a dust bag configured to store the dust separated by the dust separating part;
- a bag support part configured to accommodate the dust bag; and
- a dust bag cartridge separably coupled to a lower side of the dust separating part and configured to supply the dust bag, and
- wherein the cyclone part, the dust bag, and the dust bag cartridge are attached or detached in the same direction.

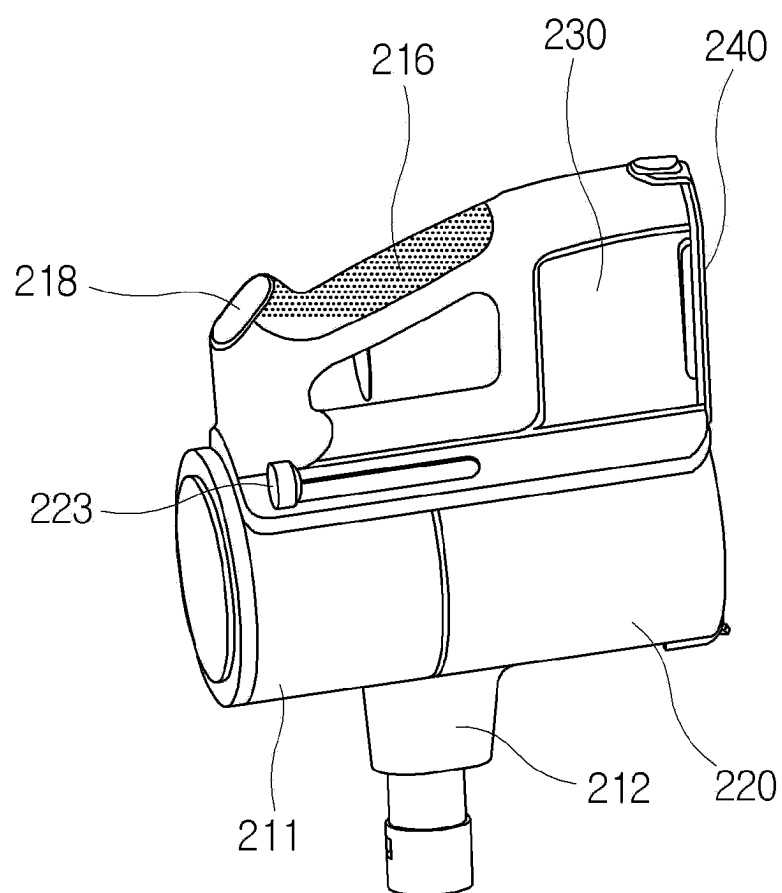
[FIG. 1]



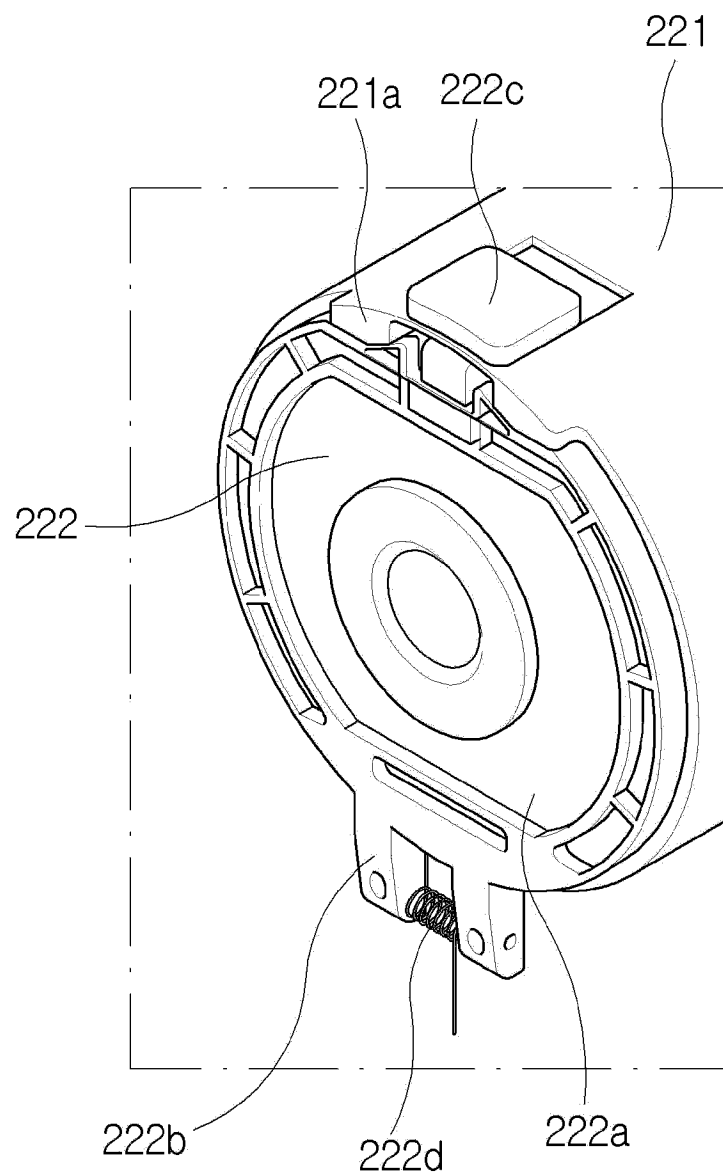
[FIG. 2]



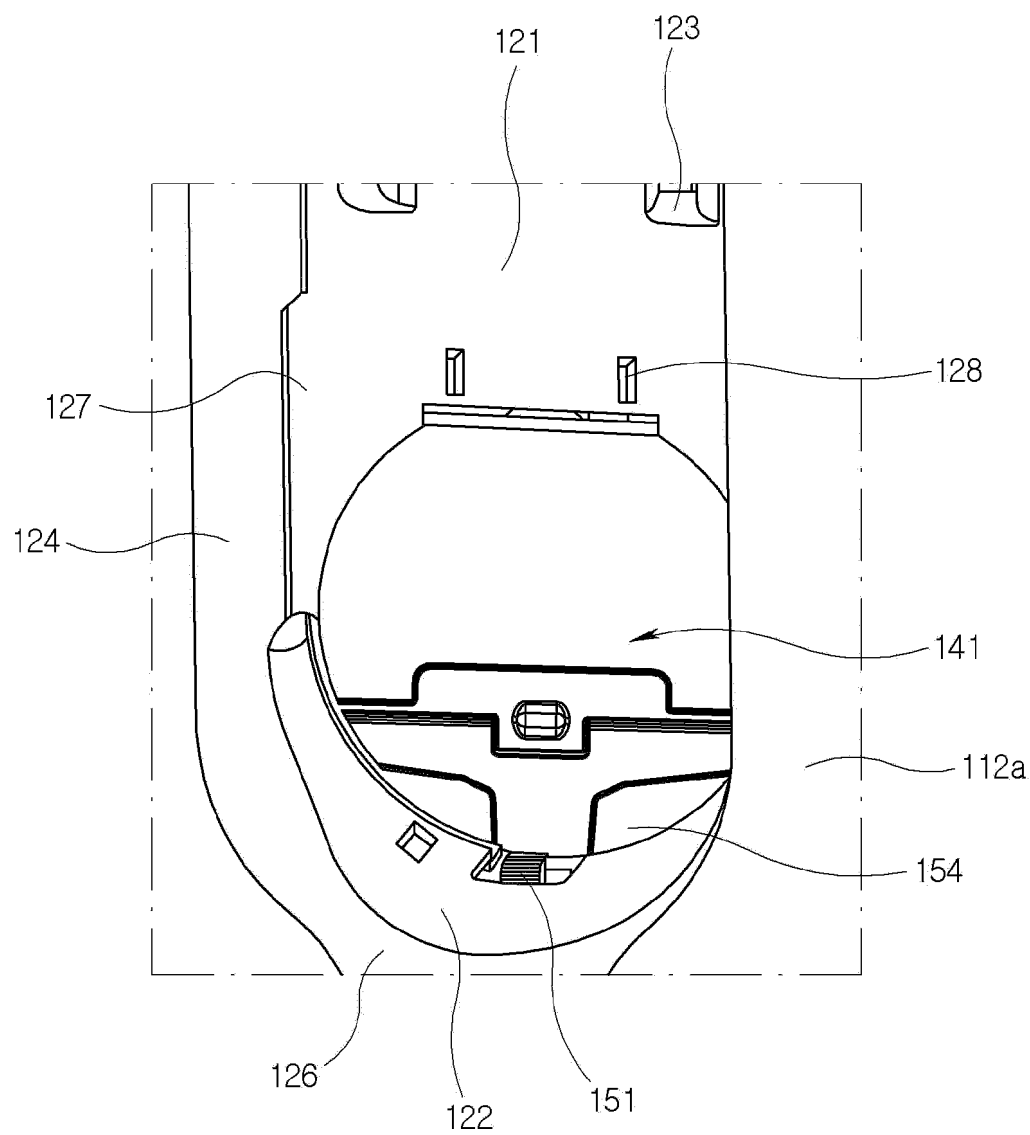
[FIG. 3]



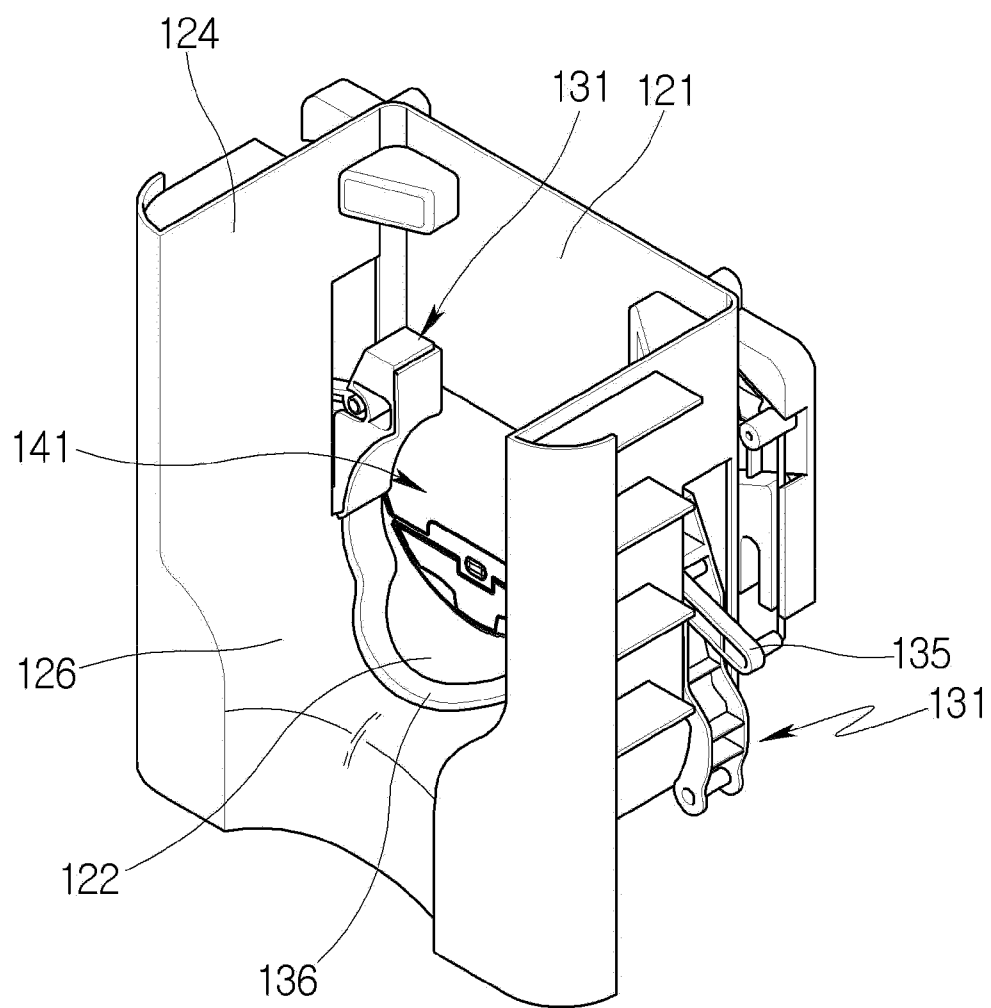
[FIG. 4]



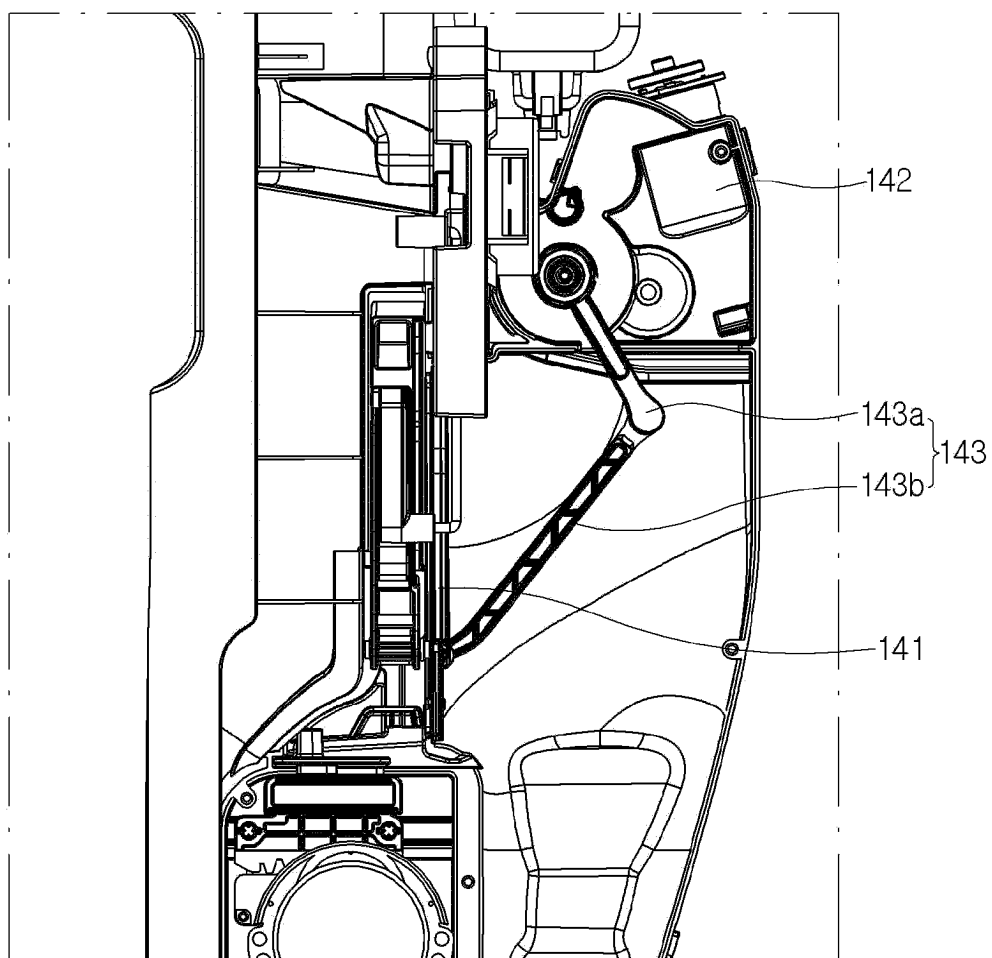
[FIG. 5]



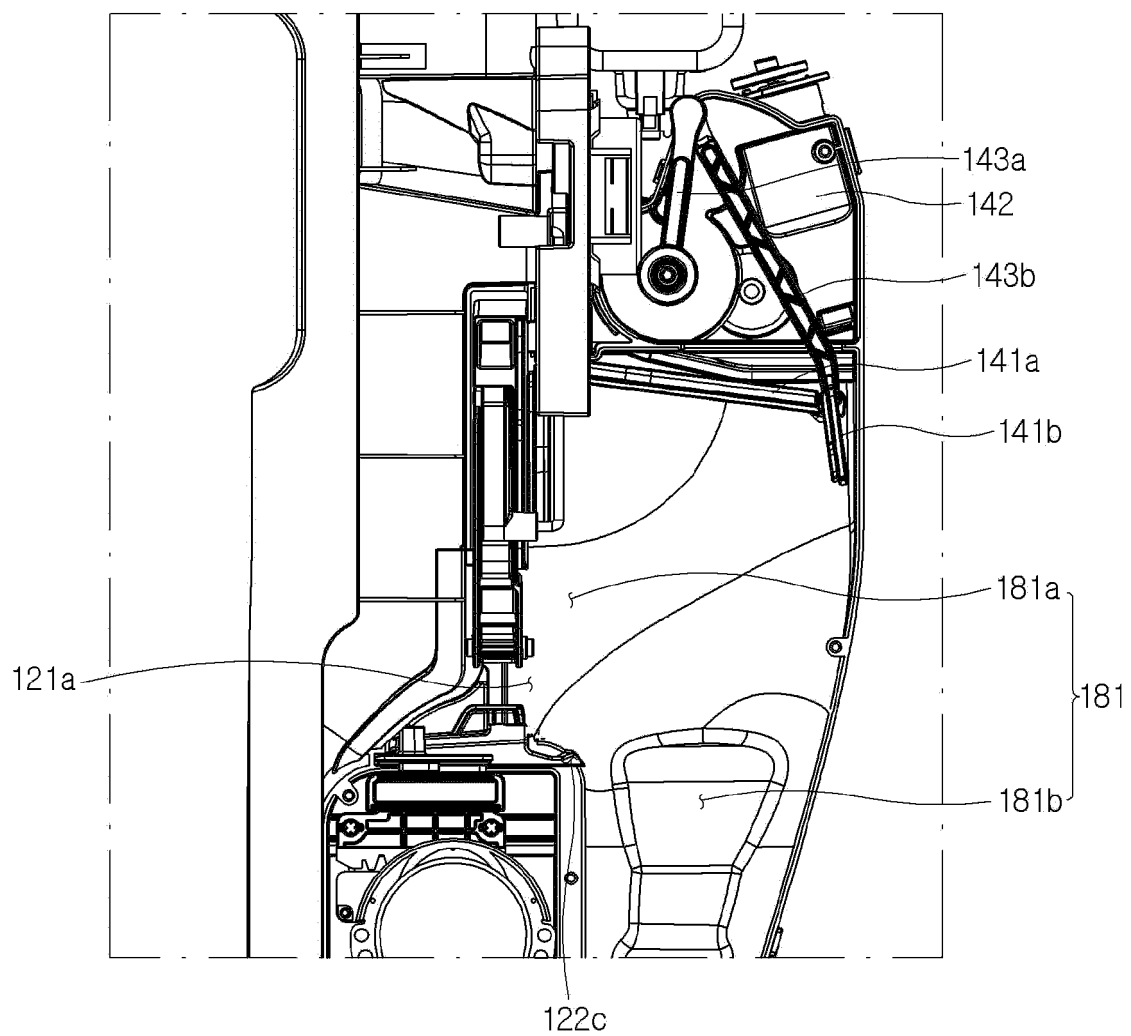
[FIG. 6]



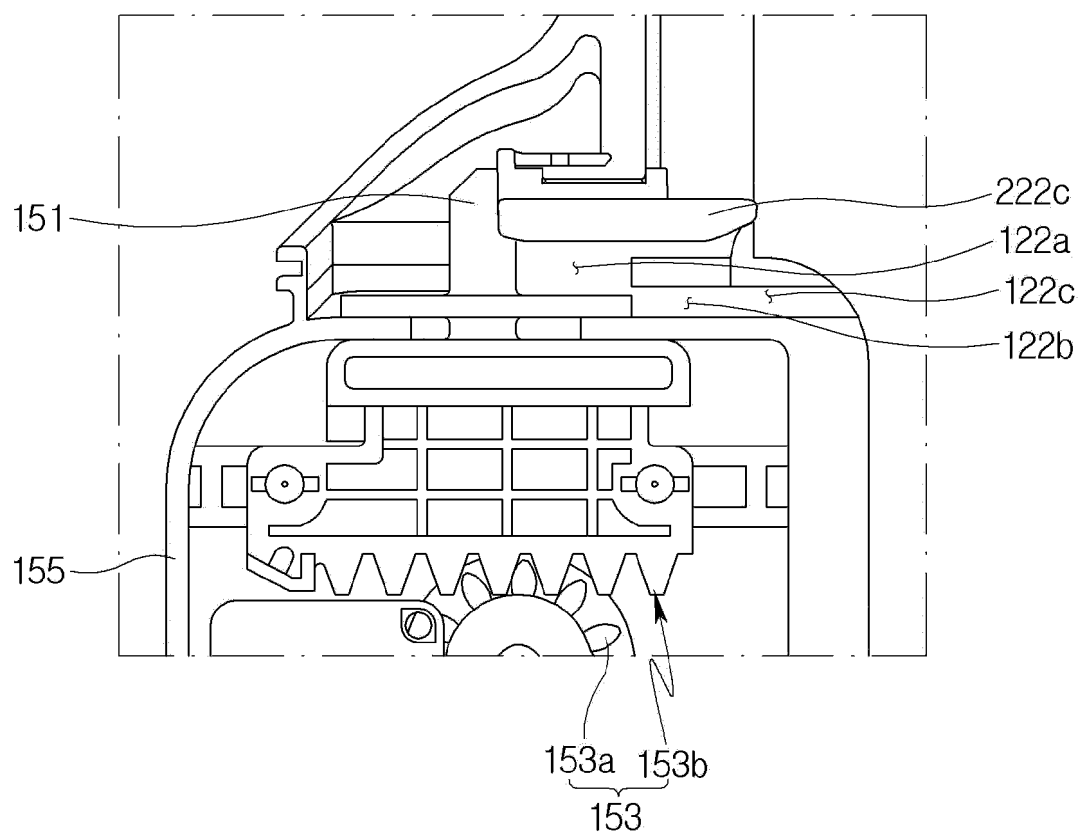
[FIG. 7]



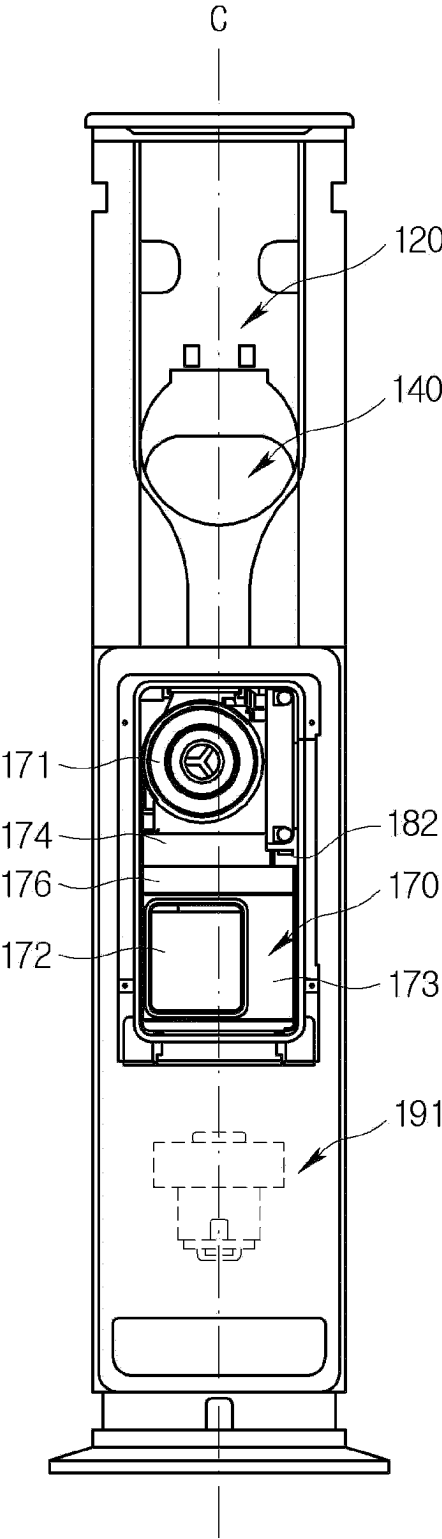
[FIG. 8]



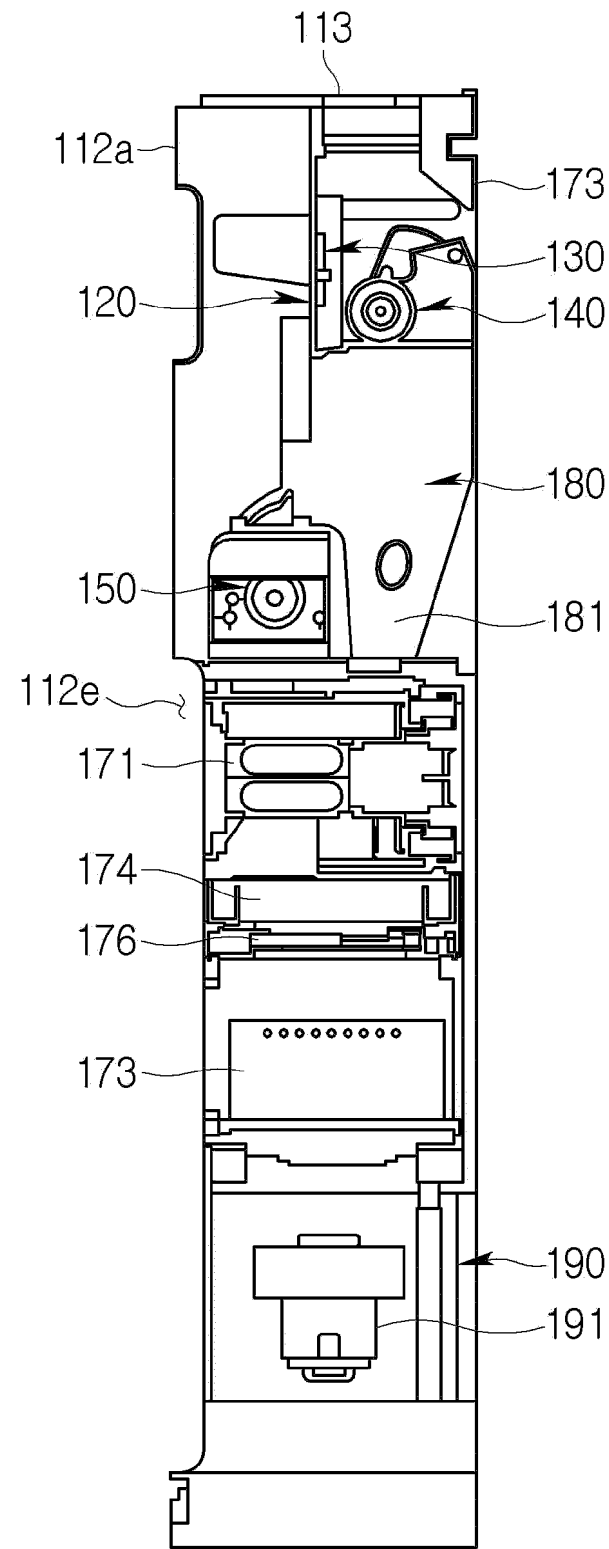
[FIG. 9]



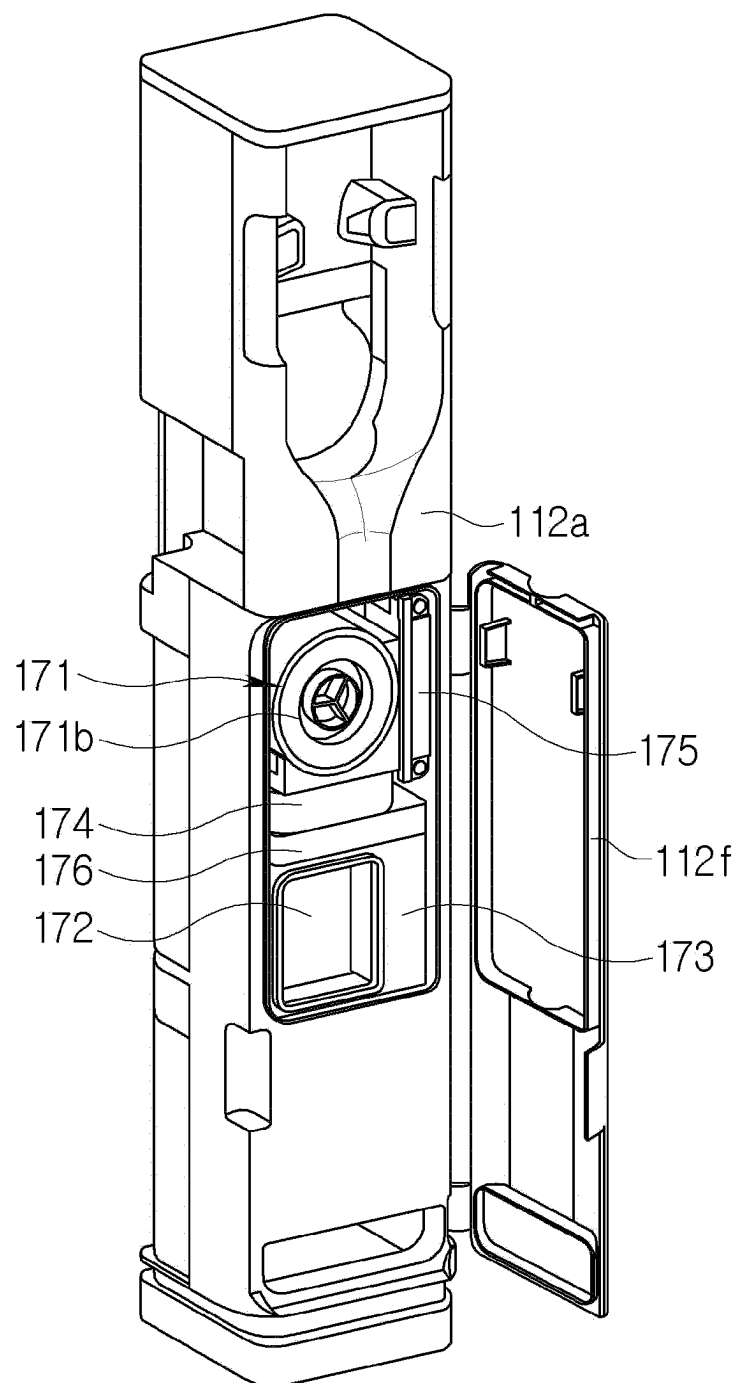
[FIG. 10]



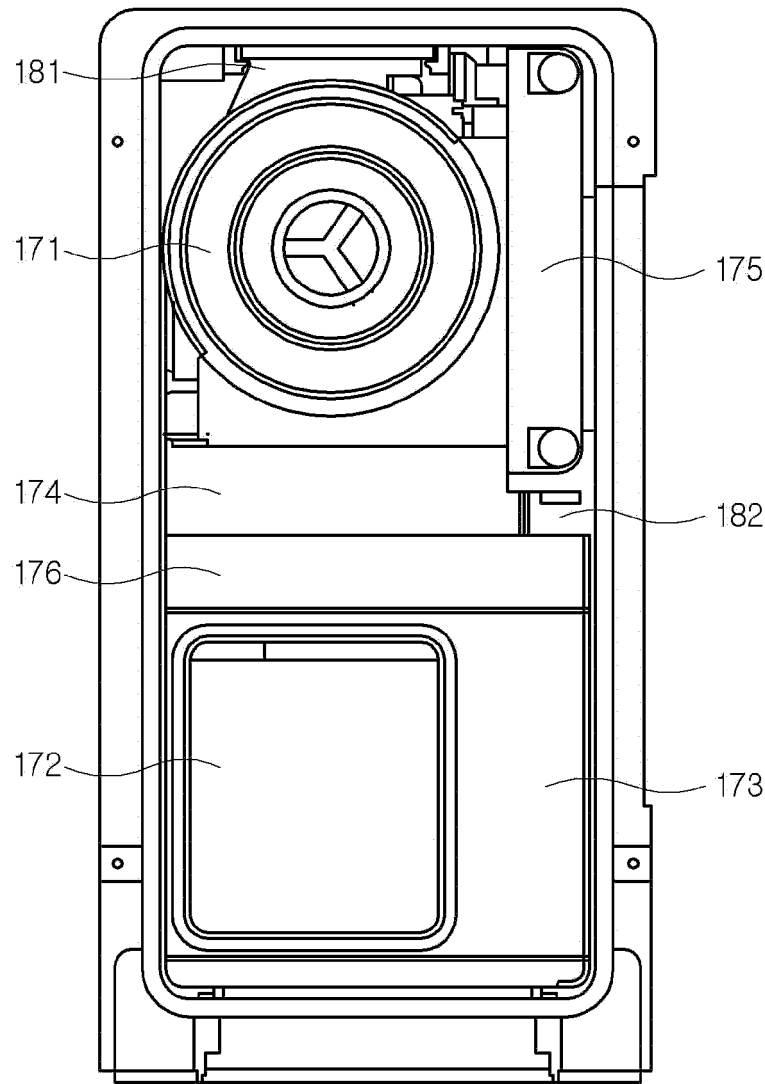
[FIG. 11]



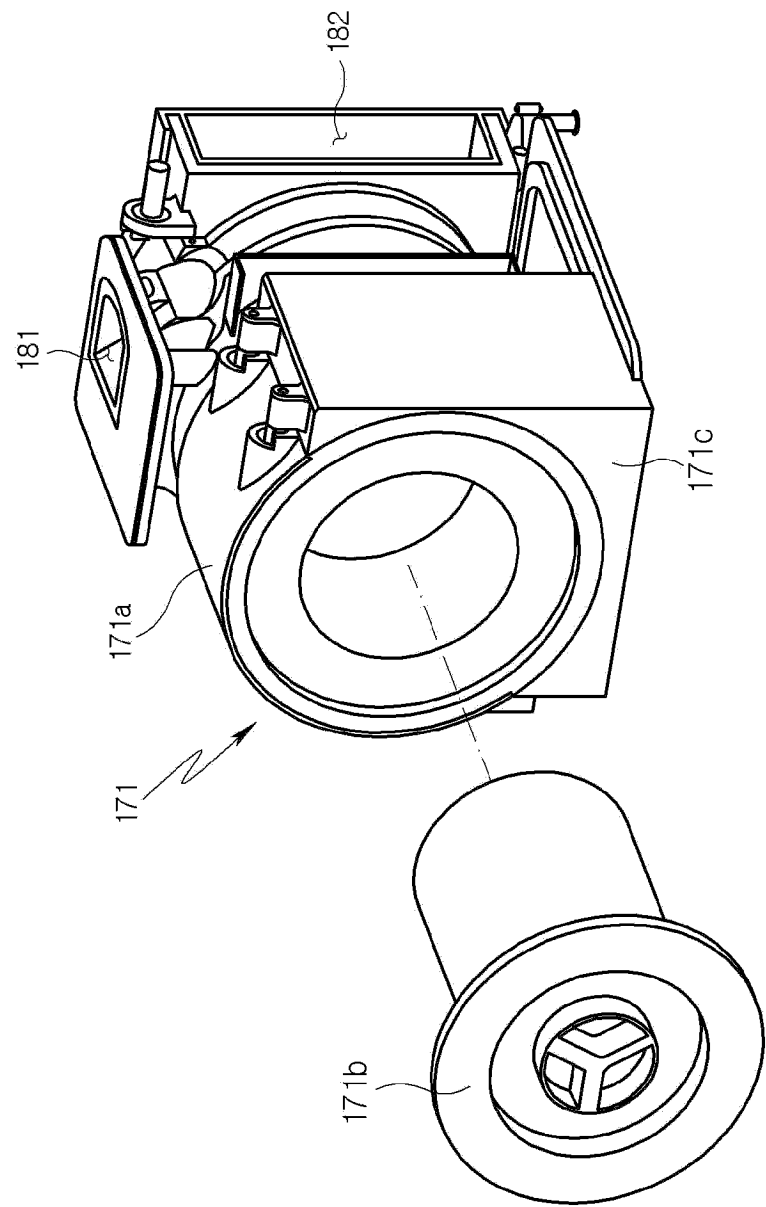
[FIG. 12]



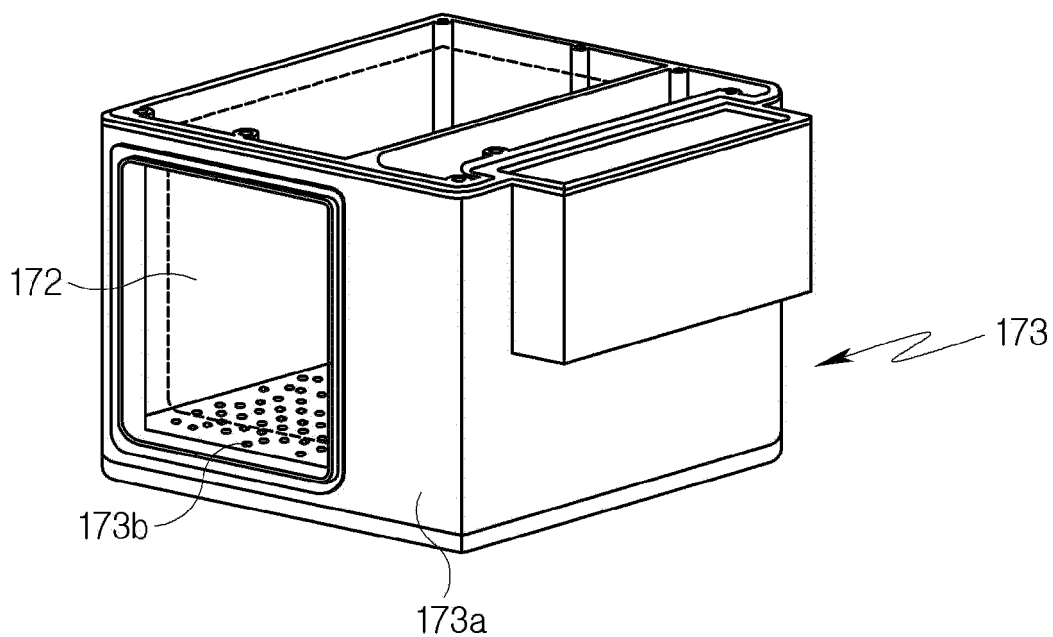
[FIG. 13]



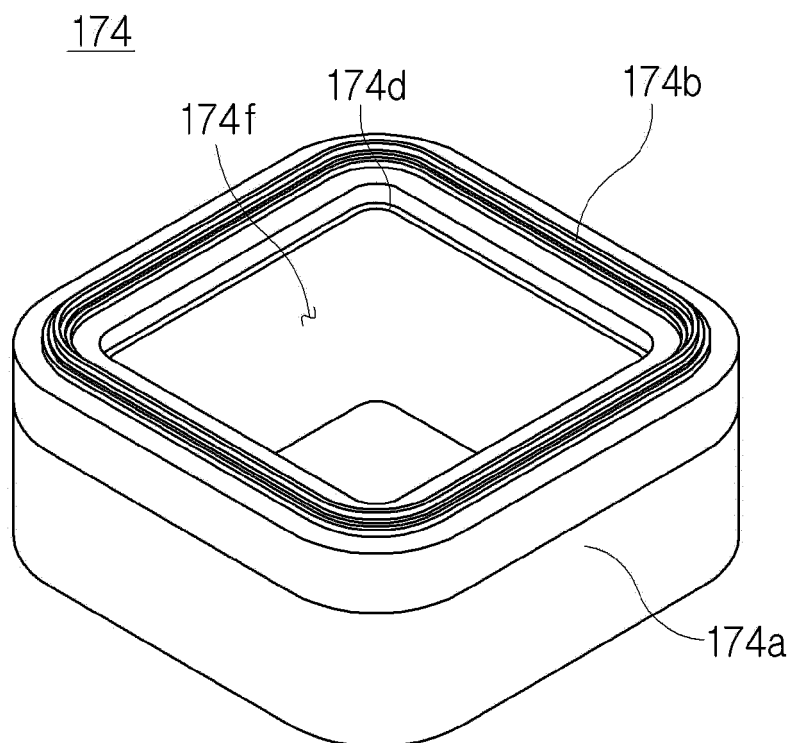
[FIG. 14]



[FIG. 15]

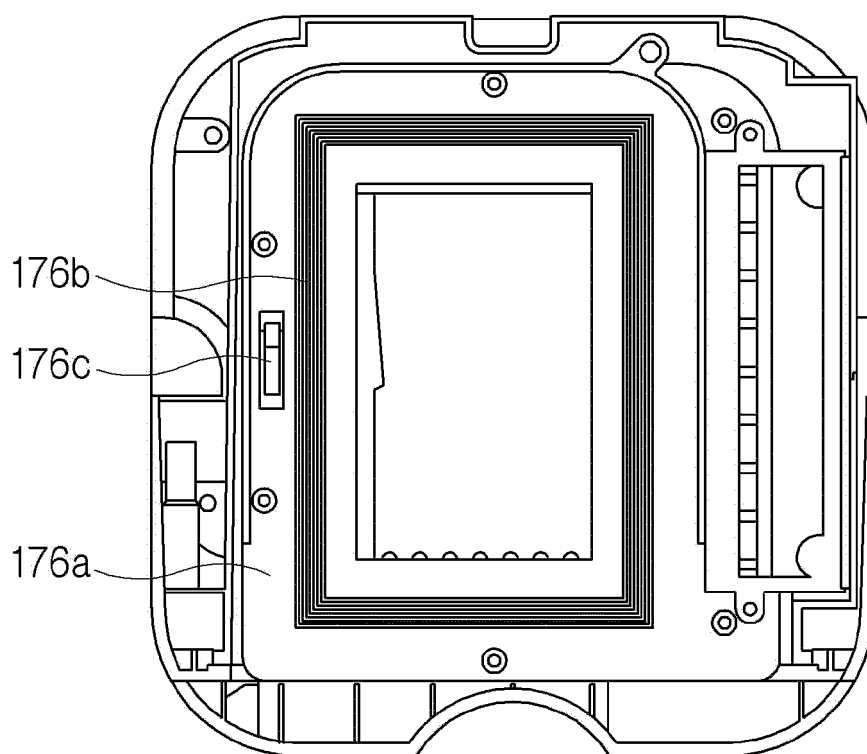


[FIG. 16]

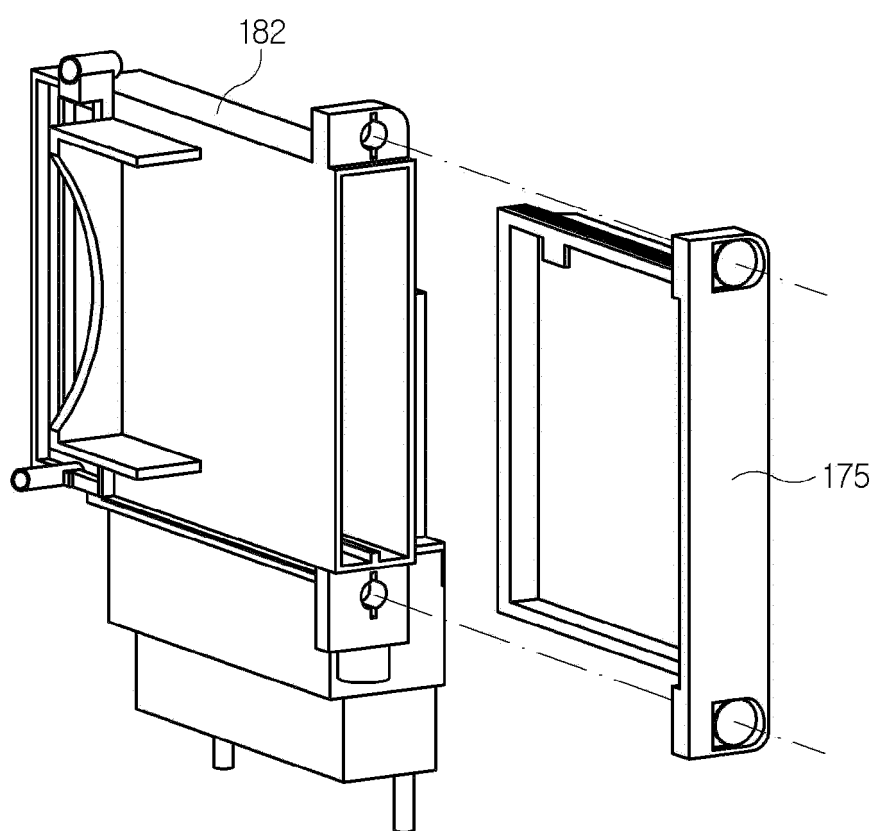


[FIG. 17]

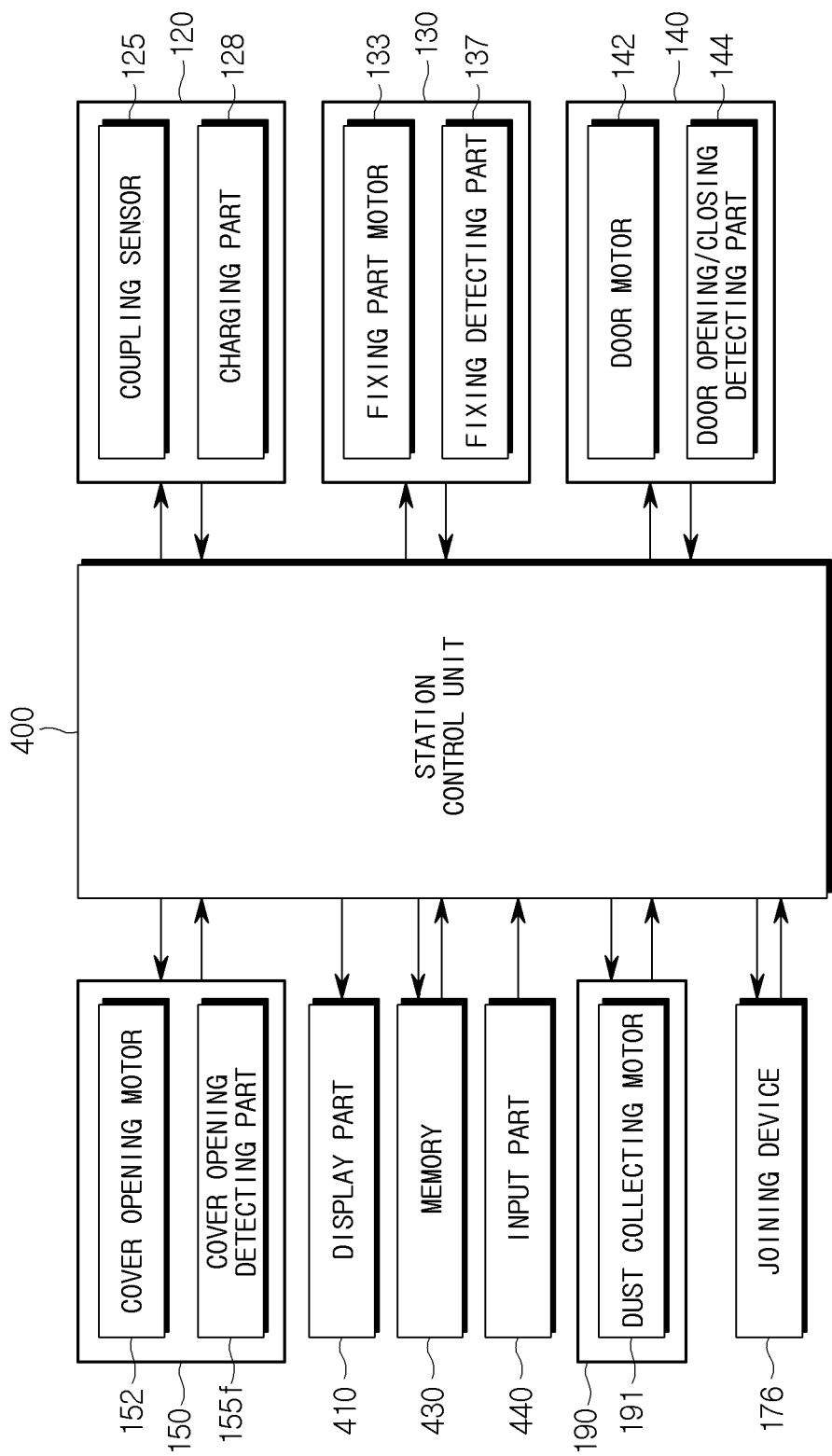
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[FIG. 18]



[FIG. 19]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2023/004430

A. CLASSIFICATION OF SUBJECT MATTER

A47L 9/16(2006.01)i; A47L 9/28(2006.01)i; A47L 7/00(2006.01)i; A47L 5/24(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 9/16(2006.01); A47L 9/28(2006.01); B09B 5/00(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: 스테이션(station), 비닐(vinyl), 접합(adhesion), 카트리지(cartridge), 봉투(bag), 먼지 분리부(dust separation), 사이클론(cyclone), 탈착(detach), 프리필터(prefilter)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-2023-0022100 A (LG ELECTRONICS INC.) 14 February 2023 (2023-02-14) See paragraphs [0221]-[0376], claims 11-12 and figures 1-17.	1-10
A	KR 10-2022-0057764 A (LG ELECTRONICS INC.) 09 May 2022 (2022-05-09) See paragraphs [0077]-[0188] and [0208] and figures 1-14.	1-10
A	KR 10-2021-0033463 A (SAMSUNG ELECTRONICS CO., LTD.) 26 March 2021 (2021-03-26) See paragraphs [0264]-[0311] and figures 22-29.	1-10
A	JP 2015-520090 A (SANGENIC INTERNATIONAL LTD.) 16 July 2015 (2015-07-16) See paragraphs [0010] and [0034] and figures 1-23.	1-10
A	CN 214297618 U (ZHANG, Xudong) 28 September 2021 (2021-09-28) See paragraph [0043], claim 4 and figures 1-6.	1-10

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

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Date of the actual completion of the international search

20 December 2023

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2023/004430

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Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
KR	10-2023-0022100	A	14 February 2023	WO	2023-014136	A1	09 February 2023
KR	10-2022-0057764	A	09 May 2022	None			
KR	10-2021-0033463	A	26 March 2021	AU	2019-397017	A1	24 June 2021
				CN	113226141	A	06 August 2021
				CN	113226141	B	23 June 2023
				CN	115281557	A	04 November 2022
				CN	115399666	A	29 November 2022
				CN	115399667	A	29 November 2022
				CN	115399668	A	29 November 2022
				CN	115399669	A	29 November 2022
				CN	116369784	A	04 July 2023
				CN	116369785	A	04 July 2023
				CN	116473459	A	25 July 2023
				DE	202019005876	U1	20 December 2022
				EP	3878337	A1	15 September 2021
				EP	3878337	A4	26 January 2022
				EP	3878337	B1	04 October 2023
				EP	4005452	A1	01 June 2022
				EP	4005452	B1	10 May 2023
				EP	4011264	A1	15 June 2022
				EP	4122366	A2	25 January 2023
				EP	4122366	A3	03 May 2023
				EP	4122370	A2	25 January 2023
				EP	4122370	A3	03 May 2023
				EP	4218523	A1	02 August 2023
				EP	4226834	A1	16 August 2023
				EP	4230105	A1	23 August 2023
				EP	4233664	A1	30 August 2023
				KR	10-2020-0073966	A	24 June 2020
				KR	10-2020-0073975	A	24 June 2020
				KR	10-2020-0074001	A	24 June 2020
				KR	10-2020-0074054	A	24 June 2020
				KR	10-2020-0074055	A	24 June 2020
				KR	10-2020-0131208	A	23 November 2020
				KR	10-2021-0033462	A	26 March 2021
				KR	10-2021-0033464	A	26 March 2021
				KR	10-2021-0060421	A	26 May 2021
				KR	10-2021-0060424	A	26 May 2021
				KR	10-2166771	B1	16 October 2020
				KR	10-2166773	B1	16 October 2020
				KR	10-2315420	B1	21 October 2021
				KR	10-2392075	B1	29 April 2022
				KR	10-2392099	B1	29 April 2022
				KR	10-2408551	B1	15 June 2022
				KR	10-2452456	B1	11 October 2022
				US	11134817	B2	05 October 2021
				US	11134818	B2	05 October 2021
				US	11337573	B2	24 May 2022
				US	11382471	B2	12 July 2022
				US	11382472	B2	12 July 2022

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2023/004430

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
		US 2021-0052121 A1	25 February 2021
		US 2021-0259489 A1	26 August 2021
		US 2021-0259490 A1	26 August 2021
		US 2021-0259491 A1	26 August 2021
		US 2021-0290017 A1	23 September 2021
		US 2021-0298549 A1	30 September 2021
		US 2021-0298550 A1	30 September 2021
		US 2022-0095862 A1	31 March 2022
		US 2023-0012532 A1	19 January 2023
		US 2023-0200607 A1	29 June 2023
		WO 2020-122631 A1	18 June 2020
JP 2015-520090 A	16 July 2015	EP 2855305 A2	08 April 2015
		GB 2502448 A	27 November 2013
		GB 2502448 B	09 July 2014
		GB 2505150 A	26 February 2014
		GB 2510277 A	30 July 2014
		GB 2510277 B	27 May 2015
		JP 6389819 B2	12 September 2018
		US 10589927 B2	17 March 2020
		US 2015-0151908 A1	04 June 2015
		WO 2013-175244 A2	28 November 2013
		WO 2013-175244 A3	13 March 2014
CN 214297618 U	28 September 2021	None	

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- KR 102161708 B1 [0013] [0014]
- KR 1020210019940 A [0016] [0017]