



(11)

EP 4 527 273 A1

(12)

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

(43) Date of publication:
26.03.2025 Bulletin 2025/13

(51) International Patent Classification (IPC):
A47L 9/28 ^(2006.01) **A47L 9/14** ^(2006.01)
A47L 9/10 ^(2006.01) **A47L 7/00** ^(2006.01)

(21) Application number: **23812023.2**

(52) Cooperative Patent Classification (CPC):
A47L 7/00; A47L 9/10; A47L 9/14; A47L 9/28

(22) Date of filing: **02.05.2023**

(86) International application number:
PCT/KR2023/005938

(87) International publication number:
WO 2023/229247 (30.11.2023 Gazette 2023/48)

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

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(30) Priority: **27.05.2022 KR 20220065134**

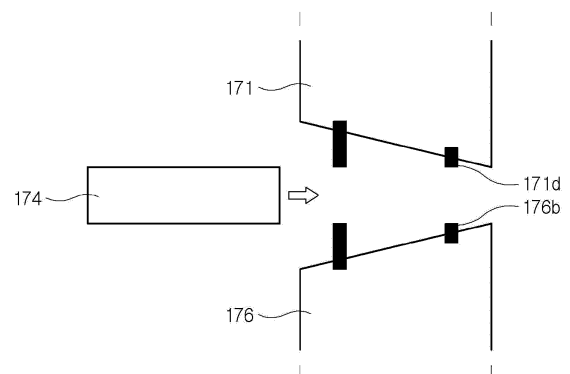
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(54) **CLEANER STATION**

(57) The present invention relates to a cleaner station and includes a housing, a coupling unit disposed in the housing and including a coupling surface to which at least a portion of a cleaner is coupled, a dust collection unit accommodated inside the housing, disposed under the coupling unit, and collecting dust inside a dust bin of the cleaner, and a dust collection motor accommodated inside the housing, disposed under the dust collection unit, and suctioning the dust inside the dust bin, wherein the dust collection unit includes a dust separator that separates dust in the air introduced from the dust bin, a dust bag that stores dust separated by the dust separator, a bag support that accommodates the dust bag, and a dust bag cartridge separably coupled under the dust separator and supplying the dust bag, and thus a new dust bag can be supplied when the dust bag is exhausted.

[FIG. 20]



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Description

[Technical Field]

- 5 **[0001]** The present invention relates to a cleaner station, and more specifically, to a cleaner station capable of separating dust contained in the air, collecting the dust in a dust bag, and emptying only the dust bag.

[Background Art]

- 10 **[0002]** In general, a cleaner is a home appliance for suctioning small trash or dust in a manner of suctioning air using electricity and filling the same in a dust bin inside a product and is commonly called a vacuum cleaner.
- 15 **[0003]** The vacuum cleaner may be classified into a manual vacuum cleaner for allowing a user to directly perform cleaning while moving the cleaner, and an automatic vacuum cleaner for performing cleaning while traveling by itself. Depending on the type of the vacuum cleaner, the manual vacuum cleaner may be classified into a canister-type vacuum cleaner, an upright vacuum cleaner, a hand vacuum cleaner, a stick-type vacuum cleaner, etc.
- 20 **[0004]** In the past, the canister-type vacuum cleaner was widely used as the household vacuum cleaner, but recently, the hand vacuum cleaner and the stick-type vacuum cleaner, which provide improved convenience of use by integrally providing a dust bin and a cleaner body, are increasingly being used.
- 25 **[0005]** The canister-type vacuum cleaner has a main body and a suction port connected by a rubber hose or a pipe and in some cases, may be used by inserting a brush into the suction port.
- 30 **[0006]** The hand vacuum cleaner is designed to maximize portability and has lightweight and a short length, and thus can have a limited cleaning area. Therefore, the hand vacuum cleaner is used to clean localized sites, such as on a desk, a sofa, or a vehicle interior.
- 35 **[0007]** A user may use the stick-type vacuum cleaner while standing to enable cleaning without bending down. Therefore, it is advantageous for cleaning a wide region while moving. While the hand vacuum cleaner cleans narrow spaces, the stick-type vacuum cleaner may clean wider spaces and clean high places out of reach. Recently, the stick-type vacuum cleaner has been provided in a module type to allow users to actively change a vacuum cleaner type for various purposes.
- 40 **[0008]** In addition, robot cleaners that perform cleaning by themselves without a user's manipulation have been recently used. A robot cleaner may automatically clean an area to be cleaned by suctioning foreign substances, such as dust, from the floor while autonomously traveling in the area to be cleaned.
- 45 **[0009]** However, since conventional handheld vacuum cleaners, stick-type vacuum cleaners, and robot cleaners have a small capacity of dust bins that store collected dust, there is inconvenience that a user needs to empty the dust bin every time.
- 50 **[0010]** In addition, when the dust bin is emptied, there is a problem that dust scatters and has a harmful effect on the user's health.
- 55 **[0011]** In addition, there is a problem of lowering a suction force of the cleaner when the remaining dust in the dust bin is not removed.
- 60 **[0012]** In addition, there is a problem that odor caused by residues occurs when the remaining dust in the dust bin is not removed.
- 65 **[0013]** As the related art document, Korean Patent Registration KR10-2161708B1 discloses a station including a dust bag.
- 70 **[0014]** The related art document includes a station to which a dust bin of a cleaner is coupled, and a dust bag is disposed at a station. In this case, the dust bag is coupled to the inside of a housing of the cleaner along a sliding groove, and an outer surface of the dust bag is formed of a material that may filter dust while passing through air.
- 75 **[0015]** However, in the case of such a permeable or semi-permeable dust bag, there is a problem that the dust inside the dust bag may leak out of the dust bag and the odor also leaks out of the dust bag.
- 80 **[0016]** In addition, as the related art document, the Korea Laid-Open Patent KR10-2021-0019940A discloses a cleaner station for collecting dust collected in a dust bin of the cleaner.
- 85 **[0017]** The related art document includes a cleaner for suctioning and storing dust in the air, and a cleaner station coupled to the dust bin to remove dust stored in the dust bin, in which a dust collection motor for suctioning foreign substances and internal air in the dust bin coupled to the cleaner station and a plastic bag-type dust collection unit.
- 90 **[0018]** However, the cleaner station may be crushed flat as the plastic bag is pulled toward the dust collection motor when the dust collection motor is operated.
- 95 **[0019]** Therefore, the cleaner station cannot easily collect dust in the plastic bag as an internal space of the plastic bag narrows when the dust collection motor is operated.
- 100 **[0020]** In addition, in the cleaner station, there is a problem that some dust flow into the dust collection motor because dust is collected in the plastic bag without being separated from the air.

[0021] Meanwhile, in the case of the cleaner station, it is necessary to have a cartridge capable of replacing a consumable plastic bag.

[0022] In this case, since a plastic bag replacement cartridge is detachably coupled to a housing, there is a limitation that dust contained in the air scatters through a space to which the cartridge is coupled.

[0023] Furthermore, when the cartridge is not accurately mounted in the housing of the station, a large amount of dust may scatter during the dust collection process, causing a failure of internal components of the station.

[0024] Therefore, it is necessary to have a structure capable of preventing the cartridge from being incorrectly mounted and detecting whether the cartridge has been correctly mounted.

[Disclosure]

[Technical Problem]

[0025] The present invention has been intended to solve the above problems of the conventional cleaner stations and is directed to providing a clean station capable of stably maintaining a shape of a dust bag while dust is collected.

[0026] In addition, the present invention is directed to providing a cleaner station capable of separating dust from air and collecting the dust in a dust bag while the air containing the dust flows toward a dust collection motor.

[0027] In addition, the present invention is directed to providing a cleaner station that does not require a user to directly tie a dust bag.

[0028] In addition, the present invention is directed to providing a cleaner station capable of emptying a dust bin by allowing a user to remove only a dust bag.

[0029] In addition, the present invention is directed to providing a cleaner station capable of supplying a new dust bag when a dust bag is exhausted.

[0030] In addition, the present invention is directed to providing a cleaner station capable of preventing dust from scattering in a cartridge capable of supplying a dust bag.

[0031] In addition, the present invention is directed to providing a cleaner station capable of preventing a cartridge from being mounted incorrectly.

[0032] In addition, the present invention is directed to providing a cleaner station capable of detecting whether a cartridge has been accurately mounted.

[Technical Solution]

[0033] To achieve the above objects, a cleaner station according to the present invention may include a housing, a coupling unit disposed in the housing and including a coupling surface to which at least a portion of a cleaner is coupled, a dust collection unit accommodated inside the housing, disposed under the coupling unit, and collecting dust inside a dust bin of the cleaner, a dust collection motor accommodated inside the housing, disposed under the dust collection unit, and generating a suction force suctioning dust inside the dust bin, and a flow path unit that guides air including the dust inside the dust bin of the cleaner to the dust collection motor.

[0034] In addition, the dust collection unit may include a dust separator that separates dust in the air introduced from the dust bin, a dust bag that stores dust separated by the dust separator, a bag support that accommodates the dust bag, and a dust bag cartridge separably coupled under the dust separator and supplying the dust bag.

[0035] In this case, the dust separator may include a dust separator case having a cyclone provided therein, and a bottom surface of the dust separator case may be formed to be inclined at a predetermined angle with the ground.

[0036] The dust separator may be provided with a sealer provided on a bottom surface of the dust separator case and in contact with the dust bag cartridge.

[0037] The dust collection unit may further include a bonding unit disposed under the dust bag cartridge and bonding the dust bag, and a top surface of the bonding unit may be formed to be inclined at a predetermined angle with the ground.

[0038] The bonding unit may have the top surface provided with a sealer in contact with the dust bag cartridge.

[0039] A height of a bottom surface of the dust separation case from the ground may gradually decrease rearward from the front end portion into which the dust bag cartridge is inserted.

[0040] A height of the top surface of the bonding unit from the ground may gradually increase rearward from a front end portion into which the dust bag cartridge is inserted.

[0041] The dust bag cartridge may include a cartridge case, and an upper sealer provided on a top surface of the cartridge case.

[0042] The dust bag cartridge may include a cartridge case, and a lower sealer provided on a bottom surface of the cartridge case.

[0043] The bonding unit may include a bonding unit case, and a cartridge detection sensor provided on a top surface of the bonding unit case and detecting whether the dust bag cartridge is coupled.

[Advantageous Effects]

[0044] As described above, according to the cleaner station of the present invention, the shape of the dust bag can be maintained while dust is collected.

[0045] In addition, dust can be separated from air and collected in the dust bag while the air containing the dust flows toward the dust collection motor.

[0046] In addition, the top of the dust bag can be bonded by a bonding unit to seal the dust bag without the user directly tying the dust bag.

[0047] In addition, the user can empty the dust bin by removing only the sealed dust bag.

[0048] In addition, a new dust bag can be supplied when a dust bag is consumed.

[0049] In addition, the cleaner station can prevent dust from scattering in a cartridge capable of supplying a dust bag.

[0050] In addition, the cleaner station can prevent a cartridge from being mounted incorrectly.

[0051] In addition, the cleaner station can detect whether a cartridge has been accurately mounted.

[Description of Drawings]

[0052]

FIG. 1 is a view for describing a cleaner system according to one embodiment of the present invention.

FIG. 2 is a schematic view showing a configuration of a cleaner according to one embodiment of the present invention.

FIG. 3 is a view showing the cleaner of FIG. 2 viewed at another angle.

FIG. 4 is a view for describing a bottom surface of a dust bin of the cleaner in the cleaner system according to one embodiment of the present invention.

FIG. 5 is a view for describing a coupling unit in a cleaner station according to one embodiment of the present invention.

FIG. 6 is a perspective view for describing a fixing unit in the cleaner station according to one embodiment of the present invention.

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

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

FIG. 10 is a view for describing the detailed arrangement and configuration of a dust collection unit in the cleaner station according to one embodiment of the present invention.

FIG. 11 is a view for describing a process in which dust flows through the dust collection unit and a flow path unit in the cleaner station according to one embodiment of the present invention.

FIG. 12 is a front view for describing the dust collection unit in the cleaner station according to one embodiment of the present invention.

FIG. 13 is a perspective view for describing a dust separation unit in the cleaner station according to one embodiment of the present invention.

FIG. 14 is a perspective view for describing a bag support unit in the cleaner station according to one embodiment of the present invention.

FIG. 15 is a cross-sectional view for describing a dust bag cartridge in the cleaner station according to one embodiment of the present invention.

FIG. 16 is a view for describing a bottom surface of the dust separator in the cleaner station according to one embodiment of the present invention.

FIG. 17 is a view for describing a top surface of a bonding unit in the cleaner station according to one embodiment of the present invention.

FIG. 18 is a perspective view for describing a dust bag cartridge in the cleaner station according to one embodiment of the present invention.

FIG. 19 is a perspective view of FIG. 18 in another direction.

FIG. 20 is a schematic view for describing a state before the dust bag cartridge is inserted in the cleaner station according to one embodiment of the present invention.

FIG. 21 is a schematic view for describing a state in which the dust bag cartridge is inserted and sealed in the cleaner station according to one embodiment of the present invention.

FIG. 22 is a view for describing a configuration of the bonding unit in the cleaner station according to one embodiment of the present invention.

FIG. 23 is a view for describing the flow path unit and a prefilter in the cleaner station according to one embodiment of the present invention.

FIG. 24 is a block diagram for describing a control configuration of the cleaner station according to one embodiment of the present invention.

[Mode for Invention]

[0053] Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[0054] Since the present invention may have various changes and various embodiments, specific embodiments are shown in the accompanying drawings and specifically described in the detail descriptions. This is not intended to limit the present invention to specific embodiments and should be construed to include all modifications, equivalents, and substitutes included in the spirit and technical scope of the present invention.

[0055] The terms used in the present application are only used to describe specific embodiments and are not intended to limit the present invention. The singular expression includes the plural expression unless the context clearly dictates otherwise.

[0056] Unless defined otherwise, all terms used herein, including technical or scientific terms, have the same meaning as commonly understood by those skilled in the art to which the present invention pertains. The terms defined in a generally used dictionary can be construed as meanings that match with the meanings of the terms from the context of the related technology and are not construed as an ideal or excessively formal meaning unless clearly defined in the present application.

[0057] FIG. 1 shows a view for describing a cleaner system according to one embodiment of the present invention.

[0058] Referring to FIG. 1, a cleaner system 1 according to one embodiment of the present specification may include a cleaner 200 and a cleaner station 100.

[0059] 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 side surface of the cleaner station 100. The cleaner station 100 may remove dust of a dust bin 220 of the cleaner 200.

[0060] FIG. 2 shows a schematic view showing a configuration of a cleaner according to one embodiment of the present invention, FIG. 3 shows a view showing the cleaner of FIG. 2 viewed at another angle, and FIG. 4 shows a view for describing a bottom surface of a dust bin of the cleaner in the cleaner system according to one embodiment of the present invention.

[0061] First, a structure of the cleaner 200 will be described with reference to FIGS. 2 to 4.

[0062] The cleaner 200 may be a cleaner that is manually manipulated by a user. For example, the cleaner 200 may be a hand cleaner or a stick-type cleaner.

[0063] The cleaner 200 may be caught 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.

[0064] Meanwhile, in one embodiment of the present invention, a direction of the cleaner 200 can be defined based on when bottom surfaces (lower surfaces) of the dust bin 220 and a battery housing 230 are placed on the ground.

[0065] In this case, the front may be a direction in which a suction unit 212 is disposed with respect to a suction motor 214, and the rear may be a direction in which a handle 216 is disposed with respect to the suction motor 214. In addition, a direction located at the right may be referred to as a right side, and a direction located at the left may be referred to as a left side with respect to when viewing the suction unit 212 from the suction motor 214. In addition, in one embodiment of the present invention, top and bottom can be defined in a direction perpendicular to the ground with respect to when the bottom surfaces (lower surfaces) of the dust bin 220 and the battery housing 230 are placed on the ground.

[0066] The cleaner 200 may include a main body 210. The main body 210 may include a main body housing 211, the suction unit 212, a dust separator 213, a suction motor 214, an air discharge cover 215, the handle 216, and a manipulation unit 218.

[0067] The main body housing 211 may form the appearance of the cleaner 200. The main body housing 211 may provide a space in which the suction motor 214 and a filter (not shown) may be accommodated. The main body housing 211 may be formed in substantially a cylindrical shape.

[0068] The suction unit 212 may protrude outward from the main body housing 211. As an example, the suction unit 212 may be formed in a cylindrical shape with an open interior. The suction unit 212 may be coupled to an extension pipe 250. The suction unit 212 may provide a flow path (hereinafter referred to as "suction flow path") through which air containing dust may flow.

[0069] Meanwhile, in the present embodiment, a virtual line passing through the inside of the suction unit 212 formed in a cylindrical shape may be formed.

[0070] The dust separator 213 may communicate with the suction unit 212. The dust separator 213 may separate dust suctioned therein through the suction unit 212. An internal space of the dust separator 213 may communicate with an internal space of the dust bin 220.

[0071] For example, the dust separator 213 may have at least one cyclone unit capable of separating dust by a cyclonic

flow. In addition, the internal space of the dust separator 213 may communicate with the suction flow path. Therefore, the air and dust suctioned through the suction unit 212 spirally flow along an inner circumferential surface of the dust separator 213. Therefore, a cyclonic flow may occur in the internal space of the dust separator 213.

[0072] The dust separator 213 is a component that communicates with the suction unit 212 and adopts the principle of a dust collector using a centrifugal force to separate dust suctioned into the main body 210 through the suction unit 212.

[0073] The dust separator 213 may further include a secondary cyclone that re-separates dust from the air discharged from the cyclone. In this case, the secondary cyclone may be located inside the cyclone to minimize a size of the dust separator. The secondary cyclone may include a plurality of cyclone bodies disposed in parallel. The air discharged from the cyclone may be partitioned into the plurality of cyclone bodies and may pass through the same.

[0074] In this case, an axis of the cyclonic flow of the secondary cyclone may extend vertically, and an axis of the cyclonic flow of the cyclone and the axis of the cyclonic flow of the secondary cyclone may be coaxial vertically and may be collectively referred to as an axis of the cyclonic flow of the dust separator 213.

[0075] The suction motor 214 may generate a suction force of suctioning air. The suction motor 214 may be accommodated in the main body housing 211. The suction motor 214 may generate a suction force by rotation. As an example, the suction motor 214 may be provided in a shape similar to a cylindrical shape.

[0076] Meanwhile, in the present embodiment, a virtual suction motor axial line extending a rotational axis of the suction motor 214 may be formed.

[0077] The air discharge cover 215 may be disposed at one side of the main body housing 211 in the axial direction. The air discharge cover 215 may accommodate a filter for filtering air. For example, the air discharge cover 215 may accommodate a HEPA filter.

[0078] An air outlet through which the air suctioned by the suction force of the suction motor 214 is discharged may be formed on the air discharge cover 215.

[0079] A flow guide may be disposed on the air discharge cover 215. The flow guide may guide a flow of the air discharged through the air outlet.

[0080] The handle 216 may be gripped by a user. The handle 216 may be disposed behind the suction motor 214. As an 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 the main body housing 211, the suction motor 214, or the dust separator 213.

[0081] The handle 216 may include a grip portion 216a formed in a pillar shape to allow the user to grip the same, a first extension 216b connected to one end portion of the grip portion 216a in a longitudinal direction (axial direction) and formed to extend toward the suction motor 214, and a second extension 216c connected to the other end portion of the first extension 216b and the grip portion 216a in the longitudinal direction (axial direction) and formed to extend toward the dust bin 220.

[0082] Meanwhile, in the present embodiment, a virtual grip portion penetration line formed to extend in the longitudinal direction of the grip portion 216a (axial direction of a pillar) and penetrating the grip portion may be formed.

[0083] As an example, the grip portion penetration line may be a virtual line formed inside the cylindrical handle 216 and may be a virtual line formed parallel to at least a portion of an outer surface (outer perimetric surface) of the grip portion 216a.

[0084] An upper surface of the handle 216 may form a partial appearance of an upper surface of the cleaner 200. Therefore, when the user grips the handle 216, one component of the cleaner 200 can be prevented from coming into contact with the user's arm.

[0085] The first extension may extend from the grip portion 216a toward the main body housing 211 or the suction motor 214. At least a portion of the first extension may extend in a horizontal direction.

[0086] The second extension may extend from the grip portion 216a to the dust bin 220. At least a portion of the second extension may extend in the horizontal direction.

[0087] The manipulation unit 218 may be disposed on the handle 216. The manipulation unit 218 may be disposed on an inclined surface formed on an upper region of the handle 216. The user may input an operation or stop command of the cleaner 200 through the manipulation unit 218.

[0088] The cleaner 200 may include the dust bin 220. The dust bin 220 may communicate with the dust separator 213. The dust bin 220 may store the dust separated by the dust separator 213.

[0089] 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 shown).

[0090] The dust bin main body 221 may provide a space in which the dust separated by the dust separator 213 may be stored. As an example, the dust bin main body 221 may be formed in a shape similar to a cylindrical shape.

[0091] Meanwhile, in the present specification, a virtual dust bin penetration line, which penetrates the inside (internal space) of the dust bin main body 221 and formed to extend in the longitudinal direction (which is an axial direction in the cylindrical dust bin main body 221) of the dust bin main body 221, may be formed.

[0092] A portion of a bottom surface (floor surface) of the dust bin main body 221 may be open. In addition, a lower

surface extension 221a may be formed on the bottom surface (floor surface) of the dust bin main body 221. The lower surface extension 221a may be formed to block a portion of the bottom surface of the dust bin main body 221.

[0093] The dust bin 220 may include the discharge cover 222. The discharge cover 222 may be disposed on the bottom surface of the dust bin 220.

[0094] The discharge cover 222 may be provided to open and close one end portion of the dust bin main body 221 in the longitudinal direction. Specifically, the discharge cover 222 may selectively open and close a downward open lower portion of the dust bin 220.

[0095] The discharge cover 222 may include a cover main body 222a and a hinge unit 222b. The cover main body 222a may be formed to block a portion of the bottom surface of the dust bin main body 221. The cover main body 222a may rotate downward with respect to the hinge unit 222b. The hinge unit 222b may be disposed adjacent to the battery housing 230. The hinge unit 222b may be provided with a torsion spring 222d. Therefore, when the discharge cover 222 is separated from the dust bin main body 221, the cover main body 222a may be supported while rotated about the hinge unit 222b at a predetermined angle or more in the dust bin main body 221 by an elastic force of the torsion spring 222d.

[0096] The discharge cover 222 may be coupled to the dust bin 220 through hook coupling. Meanwhile, the discharge cover 222 may be separated from the dust bin 220 through a coupling lever 222c. The coupling lever 222c may be disposed at the front of the dust bin. Specifically, the coupling lever 222c may be disposed on a front outer surface of the dust bin 220. When an external force is applied, the coupling lever 222c may elastically deform a hook extending from the cover main body 222a to release hook coupling between the cover main body 222a and the dust bin main body 221.

[0097] When the discharge cover 222 is closed, the bottom surface of the dust bin 220 may be blocked (sealed) by the discharge cover 222 and the lower surface extension 221a.

[0098] The dust bin 220 may include the dust bin compression lever 223 (see FIG. 8). The dust bin compression lever 223 may be disposed outside the dust bin 220 or the dust separator 213. The dust bin compression lever 223 may be disposed to move upward and downward outside the dust bin 220 or the dust separator 213. The dust bin compression lever 223 may be connected to the compression member (not shown). When the dust bin compression lever 223 is moved downward by an external force, the compression member (not shown) may also move downward. Therefore, user convenience can be provided. The compression member (not shown) and the dust bin compression lever 223 may be returned to original positions by an elastic member (not shown). Specifically, when the external force applied to the dust bin compression lever 223 is removed, the elastic member may move the dust bin compression lever 223 and the compression member (not shown) upward.

[0099] The compression member (not shown) may be disposed inside the dust bin main body 221. The compression member may move in an 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 the dust in the dust bin main body 221 downward. In addition, when the discharge cover 222 is separated from the dust bin main body 221 and the lower portion of the dust bin 220 is opened, the compression member may move from the upper portion to the lower portion of the dust bin 220 to remove foreign substances such as the remaining dust in the dust bin 220. Therefore, it is possible to increase the suction force of the cleaner by preventing the remaining dust from remaining in the dust bin 220. In addition, bad odors generated by the residue can be removed by preventing the remaining dust from remaining in the dust bin 220.

[0100] 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 under the handle 216. As an example, the battery housing 230 may have a hexahedral shape with an open lower portion. A rear surface of the battery housing 230 may be connected to the handle 216.

[0101] The battery housing 230 may include an accommodation portion that is opened downward. The battery 240 may be detachably attached through the accommodation portion of the battery housing 230.

[0102] The cleaner 200 may include the battery 240.

[0103] For example, the battery 240 may be detachably coupled to the cleaner 200. The battery 240 may be detachably coupled to the battery housing 230. As an example, the battery 240 may be inserted into the battery housing 230 from the bottom of the battery housing 230. With this configuration, it is possible to improve the portability of the cleaner 200.

[0104] Alternatively, the battery 240 may be provided integrally inside the battery housing 230. In this case, a lower surface of the battery 240 is not externally exposed.

[0105] The battery 240 may supply power to the suction motor 214 of the cleaner 200. The battery 240 may be disposed under the handle 216. The battery 240 may be disposed behind the dust bin 220.

[0106] According to an embodiment, when the battery 240 is coupled to the battery housing 230, the lower surface of the battery 240 may be externally exposed. Since 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, since the lower surface of the battery 240 is externally exposed and come into direct contact with the external air of the battery 240, it is possible to improve cooling performance of the battery 240.

[0107] Meanwhile, when the battery 240 is integrally fixed to the battery housing 230, the structure for attaching and

detaching the battery 240 and the battery housing 230 can be smaller, thereby reducing the overall size of the cleaner 200 and achieving lightweight.

[0108] The cleaner 200 may include the extension pipe 250. The extension pipe 250 may communicate with a cleaning module 260. The extension pipe 250 may communicate with the main body 210. The extension pipe 250 may communicate with the suction unit 214 of the main body 210. The extension pipe 250 may be formed in a long cylindrical shape.

[0109] The main body 210 may be connected to the extension pipe 250. The main body 210 may be connected to the cleaning module 260 through the extension pipe 250. The main body 210 may generate the suction force through the suction motor 214 and provide the suction force to the cleaning module 260 through the extension pipe 250. External dust may flow into the main body 210 through the cleaning module 260 and the extension pipe 250.

[0110] The cleaner 200 may include the cleaning module 260. The cleaning module 260 may communicate with the extension pipe 250. Therefore, external air may pass through the cleaning module 260 and the extension pipe 250 and flow into the main body 210 of the cleaner 200 by the suction force generated from the main body 210 of the cleaner 200.

[0111] Dust in the dust bin 220 of the cleaner 200 may be collected in the dust collection unit 170 of the cleaner station 100 by gravity and the suction force of a dust collection motor 191. Therefore, since the dust in the dust bin can be removed without the user's separate manipulation, user convenience can be provided. In addition, it is possible to eliminate the user's inconvenience having to empty the dust bin every time. In addition, it is possible to prevent the scattering of dust when the user empties the dust bin.

[0112] The cleaner 200 may be coupled to a side surface of a housing 110. Specifically, the main body 210 of the cleaner 200 may be caught on a coupling unit 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 unit 212 may be coupled to a suction unit guide surface 126 of the coupling unit 120. In this case, a central axis of the dust bin 220 may be disposed in a direction parallel to the ground, and the extension pipe 250 may be disposed in a direction perpendicular to the ground.

[0113] FIG. 5 shows a view for describing a coupling part in a cleaner station according to one embodiment of the present invention, FIG. 6 shows a perspective view for describing a fixing unit in the cleaner station according to one embodiment of the present invention, FIGS. 7 and 8 show views for describing the relationship between the cleaner and a door unit in the cleaner station according to the embodiment of the present invention, and FIG. 9 shows a view for describing the relationship between the cleaner and a cover opening unit in the cleaner station according to the embodiment of the present invention.

[0114] The cleaner station 100 of the present invention will be described with reference to FIGS. 5 to 9 as follows.

[0115] The cleaner 200 may be coupled to the cleaner station 100. Specifically, the main body of the cleaner 200 may be coupled to the side surface of the cleaner station 100. The cleaner station 100 may remove dust of the dust bin 220 of the cleaner 200.

[0116] The cleaner station 100 may include the housing 110. The housing 110 may form the appearance of the cleaner station 100. Specifically, the housing 110 may be formed in a pillar shape including at least one outer wall surface. As an example, the housing 110 may be formed in a shape similar to a quadrangular pillar.

[0117] The housing 110 may have a space in which the dust collection unit 170 for storing dust therein and the dust suction module 190 for generating a flow force of collecting dust into the dust collection unit 170 may be accommodated.

[0118] The housing 110 may include a floor surface 111, an outer wall surface 112, and an upper surface 113.

[0119] The floor surface 111 may support a bottom of the dust suction module 190 in a direction of gravity. That is, the floor surface 111 may support the bottom of the dust collection motor 191 of the dust suction module 190.

[0120] In this case, the floor surface 111 may be disposed toward the ground. The floor surface 111 may be not only disposed parallel to the ground, but also disposed to be inclined at a predetermined angle with the ground. With this configuration, there is an advantage that the dust collection motor 191 can be stably supported and the overall weight can be balanced even when the cleaner 200 is coupled.

[0121] Meanwhile, according to an embodiment, the floor surface 111 may further include a ground support 311a that increases an area in contact with the ground to prevent the cleaner station 100 from falling and maintain balance. As an example, the ground support 311a may be in the form of a plate extending from the floor surface 111, and one or more frames may be formed to protrude and extend from the floor surface 111 in the direction of the ground.

[0122] The outer wall surface 112 may be a surface formed in the direction of gravity and may be a surface connected to the floor surface 111. For example, the outer wall surface 112 may be a surface connected perpendicular to the floor surface 111. In another embodiment, the outer wall surface 112 may be disposed to be inclined at a predetermined angle with the floor surface 111.

[0123] The outer wall surface 112 may include at least one surface. As an 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.

[0124] In this case, in the present embodiment, the first outer wall surface 112a may be disposed on a front surface of the cleaner station 100. Here, the front surface may be a surface on which the cleaner 200 is exposed while the cleaner 200 is

coupled to the cleaner station 100. Therefore, the first outer wall surface 112a may form the appearance of the front surface of the cleaner station 100.

[0125] Meanwhile, for understanding of the present embodiment, directions are defined as follows. In the present embodiment, directions can be defined in a state in which the cleaner 200 is caught on the cleaner station 100.

[0126] When the cleaner 200 is caught on the cleaner station 100, a direction in which the cleaner 200 is exposed externally from the cleaner station 100 may be referred to as the front.

[0127] From another perspective, when the cleaner 200 is caught 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 front. In addition, a direction opposite to the direction in which the suction motor 214 is disposed in the cleaner station 100 may be referred to as the rear.

[0128] In addition, a surface in a direction facing the front surface with respect to the internal space of the housing 110 may be referred to as the rear surface of the cleaner station 100. Therefore, the rear surface may refer to a direction in which the second outer wall surface 112b is formed.

[0129] In addition, when viewing the front surface with respect to the internal space of the housing 110, a surface at the left may be referred to as a left surface, and a surface at the right may be referred to as a right surface. Therefore, the left surface may refer to a direction in which the third outer wall surface 112c is formed, and the right surface may refer to the direction in which the fourth outer wall surface 112d is formed.

[0130] The first outer wall surface 112a may be formed not only in a flat shape, but also entirely in a curved shape, and a portion thereof may be formed to include a curved surface.

[0131] The coupling unit 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. A detailed configuration of the coupling unit 120 will be described below.

[0132] Meanwhile, a structure for holding any type of cleaning module 260 used in the cleaner 200 may be added to the first outer wall surface 112a.

[0133] 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 form the appearance of the rear surface of the cleaner station 100.

[0134] In the present embodiment, the third outer wall surface 112c and the fourth outer wall surface 112d may be surfaces that connect the first outer wall surface 112a with 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. Alternatively, 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.

[0135] The third outer wall surface 112c or the fourth outer wall surface 112d may be formed not only in a flat shape, but also entirely in a curved shape, and portions thereof may be formed to include a curved surface.

[0136] Meanwhile, a structure for holding any type of cleaning module 290 used in the cleaner 200 may be added to the third outer wall surface 112c or the fourth outer wall surface 112d.

[0137] The upper surface 113 may form the appearance of the top of the cleaner station. That is, the upper surface 113 may be a surface that is disposed at the uppermost side of the cleaner station in the direction of gravity and exposed externally.

[0138] For reference, in the present embodiment, top and bottom may be top and bottom, respectively, in the direction of gravity (direction perpendicular to the ground) in a state in which the cleaner station 100 is installed on the ground.

[0139] In this case, the upper surface 113 may be disposed not only parallel to the ground, but also to be inclined at a predetermined angle with the ground.

[0140] A display unit may be disposed on the upper surface 113. As an example, the display unit may display the state of the cleaner station 100 and the state of the cleaner 200 and also display pieces of information such as a cleaning progress situation and a map of a cleaning area.

[0141] Meanwhile, according to an embodiment, the upper surface 113 may be provided separately from the outer wall surface 112. In this case, when the upper surface 113 is separated, a battery separated from the cleaner 200 may be accommodated in the internal space surrounded by the outer wall surface 112 and provided with a terminal (not shown) for charging the separated battery.

[0142] Meanwhile, a bag accommodation space 115 may be formed inside the housing 110. The bag accommodation space 115 may be disposed under the coupling unit 120 in the direction of gravity and disposed above the dust suction module 190 in the direction of gravity.

[0143] The dust collection unit 170 may be provided in the bag accommodation space 115. Specifically, a bag support 173 described below may be accommodated to be accessible in the bag accommodation space 115. In addition, a dust bag cartridge 174 described below may be detachably coupled to the bag accommodation space 115. In addition, a bonding unit 176 described below may be mounted in the bag accommodation space 115. The bag accommodation space 115 may communicate with a first flow path 181, a second flow path 182, and a bypass flow path 183, which will be described below.

With this configuration, the bag accommodation space 115 may provide a space in which air and dust introduced from the dust bin 220 may flow and may be collected in a dust bag 172.

[0144] In the present invention, the cleaner 200 may be mounted on the outer wall surface 112 of the cleaner station 100. As an 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 caught on the first outer wall surface 112a.

[0145] In this case, an axial line of the suction motor 214 may be formed perpendicular to the first outer wall surface 112a. That is, the axial line of the suction motor 214 may be formed parallel to the ground.

[0146] A virtual line penetrating the dust bin 220 may be formed perpendicular to the first outer wall surface 112a.

[0147] An axial line C of the housing 110 in the longitudinal direction may be formed perpendicular to the ground. The axial line C of the housing 110 in the longitudinal direction may be formed parallel to at least 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.

[0148] When the cleaner 200 is coupled to the cleaner station 100, an axial line of the suction motor 214 may intersect an axial line of the cleaner station 100 in the longitudinal direction. That is, the rotational axis of the suction motor 214 may intersect the axis of the cleaner station 100 in the longitudinal direction.

[0149] In addition, when the cleaner 200 is coupled to the cleaner station 100, the battery 240 may be disposed at a farther distance from the ground than the rotational axis of the suction motor 214. With this configuration, the cleaner 200 may be stably supported by the cleaner station 100.

[0150] When the cleaner 200 is coupled to the cleaner station 100, a virtual line penetrating the dust bin 220 may intersect the axis of the cleaner station 100 in the longitudinal direction. That is, the axis of the dust bin 220 in the longitudinal direction may intersect the axis of the cleaner station 100 in the longitudinal direction. In this case, an intersection of the axis of the dust bin 220 and the axis of the cleaner station 100 in the longitudinal direction may be located inside the housing 110, and more specifically, located inside the flow path unit 180.

[0151] Meanwhile, when the cleaner 200 is coupled to the cleaner station 100, the handle 216 may be disposed at a farther distance from the ground than the virtual line penetrating the dust bin 220. With this configuration, when the user grips the handle 216, it is possible to provide convenience to couple or separate the cleaner 200 to and from the cleaner station 100 with only a user's simple operation of moving the cleaner 200 in a direction parallel to the ground.

[0152] The coupling unit 120 of the cleaner station 100 of the present invention will be described with reference to FIG. 5 as follows.

[0153] The cleaner station 100 may include the coupling unit 120 to which the cleaner 200 is coupled. Specifically, the coupling unit 120 may be disposed on 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.

[0154] The coupling unit 120 may include the coupling surface 121. The coupling surface 121 may be disposed on a side surface of the housing 110. As an example, the coupling surface 121 may be a surface formed in a groove shape that is concave from the first outer wall surface 112a to the inside of the cleaner station 100. That is, the coupling surface 121 may be a surface formed by forming a step with the first outer wall surface 112a.

[0155] The cleaner 200 may be coupled to the coupling surface 121. As an example, the coupling surface 121 may come into contact with the bottom surfaces of the dust bin 220 and the battery housing 230 of the cleaner 200. Here, the bottom surface may be a surface facing the ground when the user uses the cleaner 200 or places the cleaner 200 on the ground.

[0156] As an example, an angle formed by the coupling surface 121 and the ground may be a right angle. Therefore, when the cleaner 200 is coupled to the coupling surface 121, it is possible to minimize a space of the cleaner station 100.

[0157] As another example, the coupling surface 121 may be disposed to be inclined at a predetermined angle with the ground. Therefore, when the cleaner 200 is coupled to the coupling surface 121, the cleaner station 100 can be stably supported.

[0158] A dust through hole 121a may be formed in the coupling surface 121 to allow external air of the housing 110 to flow therein. The dust through hole 121a may be formed in a hole shape corresponding to the shape of the dust bin 220 so that the dust in the dust bin 220 flows into the dust collection unit 170. The dust through hole 121a may be formed to correspond to the shape of the discharge cover 222 of the dust bin 220. The dust through hole 121a may be formed to communicate with the flow path unit 180 described below.

[0159] The coupling unit 120 may include the dust bin guide surface 122. The dust bin guide surface 122 may be disposed on the first outer wall surface 112a. The dust bin guide surface 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.

[0160] The dust bin guide surface 122 may be formed in a shape corresponding to the outer surface of the dust bin 220. The front outer surface of the dust bin 220 may be coupled to the dust bin guide surface 122. Therefore, the convenience of coupling the cleaner 200 to the coupling surface 121 can be provided.

[0161] Meanwhile, a protrusion movement hole 122a may be formed in the dust bin guide surface 122, and a push protrusion 151 described below may move linearly along the protrusion movement hole 122a. In addition, a gear box 155 for accommodating a gear of the cover opening unit 150 described below and the like may be provided under the dust bin guide surface 122 in the direction of gravity. In this case, a guide space 122b in which the push protrusion 151 may move

may be formed between a bottom surface of the dust bin guide surface 122 and a top surface of the gear box 155. In addition, the guide space 122b may communicate with the first flow path 181 through a bypass hole 122c. That is, the protrusion movement hole 122a, the guide space 122b, the bypass hole 122c, and the first flow path 181 may form one flow path. With this configuration, when the dust collection motor 191 is operated while the dust bin 220 is coupled to the coupling unit 120, there is an advantage that dust and the like remaining in the dust bin 220 and the dust bin guide surface 122 may be suctioned through the flow path.

[0162] The coupling unit 120 may include a guide protrusion 123. The guide protrusion 123 may be disposed on the coupling surface 121. The guide protrusion 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 spaced apart from each other may correspond to a width of the battery housing 230 of the cleaner 200. Therefore, the convenience of coupling the cleaner 200 to the coupling surface 121 can be provided.

[0163] The coupling unit 120 may include a coupling unit side wall 124. The coupling unit side wall 124 may be a wall surface disposed on both side surfaces of the coupling surface 121 and connected perpendicular to the coupling surface 121. The coupling unit side wall 124 may be connected to the first outer wall surface 112a. In addition, the coupling unit side wall 124 may form a surface connected to the dust bin guide surface 122. Therefore, the cleaner 200 can be stably accommodated.

[0164] The coupling unit 120 may include a coupling sensor 125. The coupling sensor 125 may detect whether the cleaner 200 is coupled to the coupling unit 120.

[0165] The coupling sensor 125 may include a contact sensor. As an 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 cleaner 200 may come into contact with the coupling sensor 125, and the coupling sensor 125 may detect that the cleaner 200 has been coupled.

[0166] Meanwhile, the coupling sensor 125 may include a non-contact sensor. As an example, the coupling sensor 125 may include an infrared (IR) sensor. In this case, the coupling sensor 125 may be disposed on the coupling unit side wall 124. Therefore, when the dust bin 220 or the main body 210 of the cleaner 200 reaches the coupling surface 121 through the coupling unit side wall 124, the coupling sensor 125 may detect the presence of the dust bin 220 or the main body 210.

[0167] In a 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.

[0168] The coupling sensor 125 may be a member of determining whether power is applied to the battery 240 of the cleaner 200 and whether the cleaner 200 has been coupled.

[0169] The coupling unit 120 may include a suction unit guide surface 126. The suction unit guide surface 126 may be disposed on the first outer wall surface 112a. The suction unit guide surface 126 may be connected to the dust bin guide surface 122. The suction unit 212 may be coupled to the suction unit guide surface 126. A shape of the suction unit guide surface 126 may be formed in a shape corresponding to the shape of the suction unit 212.

[0170] The coupling unit 120 may further include a fixing member entrance hole 127. The fixing member entrance hole 127 may be formed in the form of a long hole along the coupling unit side wall 124 so that the fixing member 131 enters and exits.

[0171] With this configuration, when the user couples the cleaner 200 to the coupling unit 120 of the cleaner station 100, the main body 210 of the cleaner 200 may be stably disposed on the coupling unit 120 by the dust bin guide surface 122, the guide protrusion 123, and the suction unit guide surface 126. Therefore, convenience of coupling the dust bin 220 and the battery housing 230 of the cleaner 200 to the coupling surface 121 can be provided.

[0172] Meanwhile, the cleaner station 100 may further include a charging unit 128. The charging unit 128 may be disposed on the coupling unit 120. The charging unit 128 may be electrically connected to the cleaner 200 coupled to the coupling unit 120. The charging unit 128 may supply power to the battery of the cleaner 200 coupled to the coupling unit 120.

[0173] In addition, the cleaner station 100 may further include a side door (not shown). The side door may be disposed in the housing 110. The side door may selectively expose the dust collection unit 170 externally. Therefore, the user can easily remove the dust bag 172 from the cleaner station 100.

[0174] A fixing unit 130 according to the present invention will be described with reference to FIG. 6 as follows.

[0175] The cleaner station 100 according to the present invention may include the fixing unit 130. The fixing unit 130 may be disposed on the coupling unit side wall 124. In addition, the fixing unit 130 may be disposed on the rear surface of 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.

[0176] The fixing unit 130 may include a fixing member 131 for fixing the dust bin 220 and the battery housing 230 of the cleaner 200, and a fixing unit motor 133 for driving the fixing member 131. In addition, the fixing unit 130 may further include a fixing unit link 135 for transmitting the power of the fixing unit motor 133 to the fixing member 131.

[0177] The fixing member 131 may be disposed on the coupling unit side wall 124 and may be provided to reciprocate on

the coupling unit side wall 124 to fix the dust bin 220. Specifically, the fixing member 131 may be accommodated inside the fixing member entrance hole 127.

[0178] The fixing member 131 may be disposed at each of both sides of the coupling unit 120. As an example, a pair of two fixing members 131 may be disposed symmetrically with respect to the coupling surface 121.

[0179] The fixing unit motor 133 may provide power for moving the fixing member 131.

[0180] The fixing unit link 135 may convert a rotational force of the fixing unit motor 133 into the reciprocating movement of the fixing unit member 131.

[0181] When the cleaner 200 is coupled, a fixing sealer 136 may be disposed on the dust bin guide surface 122 to airtighten the dust bin 220. With this configuration, when the dust bin 220 of the cleaner 200 is coupled, the fixing sealer 136 may be pressed by the weight of the cleaner 200, and the dust bin 220 and the dust bin guide surface 122 may be sealed.

[0182] The fixing sealer 136 may be disposed on a virtual extension line of the fixing member 131. With this configuration, when the fixing unit motor 133 is operated so that the fixing member 131 presses the dust bin 220, a perimeter of the dust bin 220 at the same height may be sealed.

[0183] According to an embodiment, the fixing sealer 136 may be disposed on the dust bin guide surface 122 in a bent line shape corresponding to the arrangement of the cover opening unit 150 described below.

[0184] Therefore, when the main body 210 of the cleaner 200 is disposed on the coupling unit 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 unit 120 of the cleaner station 100, the fixing unit motor 133 may fix the main body 210 of the cleaner 200 by moving the fixing member 131.

[0185] Therefore, it is possible to increase the suction force of the cleaner by preventing the remaining dust from remaining in the dust bin. In addition, bad odors generated by the residue can be removed by preventing the remaining dust from remaining in the dust bin.

[0186] A door unit 140 of the present invention will be described with reference to FIGS. 7 and 8 as follows.

[0187] The cleaner station 100 of the present invention may include the door unit 140. The door unit 140 may be formed to open and close the dust through hole 121a.

[0188] The door unit 140 may include a door 141, a door motor 142, and a door arm 143.

[0189] The door 141 may be hinge-coupled to the coupling surface 121 to open and close the dust through hole 121a. The door 141 may include a door main body 141a.

[0190] The door main body 141a may be formed in a shape that may block the dust through hole 121a. As an example, the door main body 141a may be formed in a shape similar to a disk shape.

[0191] Based on a state in which the door main body 141a blocks the dust through hole 121a, a hinge unit may be disposed at the top of the door body 141a, and an arm coupling portion 141b may be disposed at the bottom of the door main body 141a.

[0192] The door main body 141a may be formed in a shape that may airtighten the dust through hole 121a. As an example, an outer surface of the door main body 141a exposed externally from the cleaner station 100 is formed to have a diameter corresponding to a diameter of the dust through hole 121a, and an inner surface of the door main body 141a disposed inside the cleaner station 100 is formed to have a diameter greater than the diameter of the dust through hole 121a. In addition, a step may occur between the outer surface and inner surface of the door main body 141a. Meanwhile, at least one reinforcing rib for connecting the hinge unit to the arm coupling portion 141b and reinforcing support strength of the door main body 141a may be formed to protrude from the inner surface of the door main body 141a.

[0193] The hinge unit may be a unit for hinge-coupling the door 141 to the coupling surface 121. The hinge unit may be disposed at a top end portion of the door main body 141a and coupled to the coupling surface 121.

[0194] The arm coupling portion 141b may be a portion rotatably coupled to the door arm 143. The arm coupling portion 141b may be disposed under the door main body 141a, rotatably coupled to the door main body 141a, and rotatably coupled to the door arm 143.

[0195] With this configuration, when the door arm 143 pulls the door main body 141a while the door 141 closes the dust through hole 121a, the door main body 141a may be moved while rotating about the hinge unit inward from the cleaner station 100 to open the dust through hole 121a. Meanwhile, in a state in which the dust through hole 121a is opened, when the door arm 143 pushes the door main body 141a, the door main body 141a may be moved while rotating about the hinge unit outward from the cleaner station 100 to block the dust through hole 121a.

[0196] Meanwhile, in a state in which the cleaner 200 is coupled to the cleaner station 100 and the discharge cover 220 is separated from the dust bin body 210, the door 141 may come into contact with the discharge cover 220. In addition, as the door 141 rotates, the discharge cover 220 may be rotated in conjunction with the door 141.

[0197] 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. Here, the forward direction may be a direction in which the door arm 143 pulls the door 141. Therefore, when the door arm 143 rotates in the forward direction, the dust through hole 121a may be opened. In addition, the reverse direction may be a direction in which the door arm 143 pushes the door 141. Therefore, when the door arm 143 rotates in the reverse direction, at least a portion of the dust through hole 121a may be closed. The

forward direction may be a direction opposite to the reverse direction.

[0198] The door arm 143 may connect the door 141 to the door motor 142 and open and close the door 141 using the power generated from the door motor 142.

[0199] As an example, the door arm 143 may include a first door arm 143a and a second door arm 143b. One end portion 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 portion of the first door arm 143a may be rotatably coupled to the second door arm 143b. The first door arm 143a may transmit the force transmitted from the door motor 142 to the second door arm 143b. One end portion of the second door arm 143b may be coupled to the first door arm 143a. The other end portion of the second door arm 143b may be coupled to the door 141. The second door arm 143b may open and close the dust through hole 121a by pushing or pulling the door 141.

[0200] The door unit 140 may further include a door opening and closing detector 144. The door opening and closing detector 144 may be provided inside the housing 100 to detect whether the door 141 is in an open state.

[0201] As an example, the door opening and closing detector 144 may be disposed at each of both end portions of a rotational movement region of the door arm 143. As another example, the door opening and closing detector 144 may be disposed at each of both end portions of a movement region of the door 141.

[0202] Therefore, when the door arm 143 moves to a preset door open position DP1 or the door 141 is opened to a predetermined position, the door opening and closing detector 144 may detect that the door has been opened. In addition, when the door arm 143 moves to a preset door closed position DP2 or the door 141 is opened to a predetermined position, the door opening and closing detector 144 may detect that the door has been opened.

[0203] The door opening and closing detector 144 may include a contact sensor. As an example, the door opening and closing detector 144 may include a micro switch.

[0204] Meanwhile, the door opening and closing detector 144 may include a non-contact sensor. As an example, the door opening and closing detector 144 may include an IR sensor.

[0205] With this configuration, the door unit 140 may selectively open and close at least a portion of the coupling surface 121 so that the outside of the first outer wall surface 112a communicates with the flow path unit 180 and/or the dust collection unit 170.

[0206] The door unit 140 may be opened together 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 be closed together in conjunction with the door unit 140.

[0207] When the dust in the dust bin 220 of the cleaner 200 is removed, the door motor 142 may rotate the door 141 to couple the discharge cover 222 to the dust bin main body 221. Specifically, the door motor 142 may rotate the door 141 about the hinge unit, and the door 141 rotating about the hinge unit may push the discharge cover 222 toward the dust bin main body 221.

[0208] The cover opening unit 150 of the present invention will be described with reference to FIG. 9 as follows.

[0209] The cleaner station 100 of the present invention may include the cover opening unit 150. The cover opening unit 150 may be disposed on the coupling unit 120 to open the discharge cover 222 of the cleaner 200.

[0210] The cover opening unit 150 may include a push protrusion 151, a cover opening motor 152, a cover opening gear 153, a support plate 154, and a gear box 155.

[0211] The push protrusion 151 may move to press the coupling lever 222c when the cleaner 200 is coupled.

[0212] The push protrusion 151 may be disposed on the dust bin guide surface 122. Specifically, the protrusion movement hole may be formed in the dust bin guide surface 122, and the push protrusion 151 may be exposed externally through the protrusion movement hole.

[0213] The push protrusion 151 may be disposed at a position at which the coupling lever 222c may be pressed when the cleaner 200 is coupled. That is, the coupling lever 222c may be disposed on the protrusion movement hole. In addition, the coupling lever 222c may be disposed on the movement region of the push protrusion 151.

[0214] The push protrusion 151 may linearly reciprocate to press the coupling lever 222c. Specifically, the push protrusion 151 may be coupled to the gear box 155 to guide linear movement. The push protrusion 151 may be coupled to the cover opening gear 153 and moved together by the movement of the cover opening gear 153.

[0215] 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 shown) in the forward or reverse direction. Here, the forward direction may be a direction in which the push protrusion 151 presses the coupling lever 222c. In addition, the reverse direction may be a direction in which the push protrusion 151 pressing the coupling lever 222c is returned to an original position. The forward direction may be a direction opposite to the reverse direction.

[0216] The cover opening gear 153 may be coupled to the cover opening motor 152 to move the push protrusion 151 using the power of the cover opening motor 152. Specifically, the cover opening gear 153 may be accommodated inside the gear box 155. A driving gear 153a of the cover opening gear 153 may be coupled to the motor shaft of the cover opening motor 152 to receive power. A driven gear 153b of the cover opening gear 153 may be coupled to the push protrusion 151 to move the push protrusion 151. As an example, the driven gear 153b may be provided in the form of a rack gear, engaged

with the driving gear 153a, and may receive power from the driving gear 153a.

[0217] In this case, the discharge cover 222 may be provided with the torsion spring 222d. The discharge cover 222 may be rotated at a predetermined angle or more by an elastic force of the torsion spring 222d and supported at the rotated position. Therefore, the discharge cover 222 may be opened so that the dust through hole 121a communicates with the inside of the dust bin 220.

[0218] The gear box 155 may be provided inside the housing 110, disposed under the coupling unit 120 in the direction of gravity, and may have the cover opening gear 153 accommodated therein.

[0219] The gear box 155 may be provided with a cover opening detector 155f. In this case, the cover opening detector 155f may include a contact sensor. As an example, the cover opening detector 155f may include a micro switch. Meanwhile, the cover opening detector 155f may also include a non-contact sensor. As an example, the cover opening detector 155f may include an IR sensor.

[0220] At least one cover opening detector 155f may be disposed on an inner or outer surface of the gear box 155. As an example, one cover opening detector 155f may be disposed on the inner surface of the gear box 155. In this case, the cover opening detector 155f may detect the push protrusion 151 located at an initial position.

[0221] Therefore, according to the present invention, the dust bin 220 may be opened by the cover opening unit 150 without the user separately opening the discharge cover 222 of the cleaner, thereby improving convenience.

[0222] In addition, since the discharge cover 222 is opened while the cleaner 200 is coupled to the cleaner station 100, it is possible to prevent the scattering of dust.

[0223] FIGS. 10 to 23 show views for describing the configuration and arrangement of the dust collection unit in the cleaner system according to the embodiment of the present invention.

[0224] Meanwhile, the dust collection unit 170 will be described with reference to FIGS. 10 to 23 as follows.

[0225] The cleaner station 100 may include the dust collection unit 170. The dust collection unit 170 may be disposed inside the housing 110. The dust collection unit 170 may be disposed in the bag accommodation space 115. In addition, the dust collection unit 170 may be disposed above the coupling unit 191 in the direction of gravity.

[0226] The dust collection unit 170 may collect dust inside the dust bin 220 of the cleaner 200. Specifically, when the dust collection motor 191 is operated while the cleaner 200 is coupled to the cleaner station 100 and the inside of the dust bin 220 communicates with the flow path unit 180, the dust inside the dust bin 220 may flow along the flow path unit 180 and may be collected in the dust collection unit 170.

[0227] Meanwhile, in typical cleaner stations, since dust is collected in the dust bag while not separated from air, some dust may flow into the dust collection motor. Therefore, the dust flowing into the dust collection motor may cause a failure of the dust collection motor.

[0228] To solve such a problem, a prefilter or the like may be disposed on the flow path, but when dust is filtered using only the prefilter, there is a limitation that the suction force of the dust collection motor is lowered because the prefilter is blocked by a large amount of dust.

[0229] To solve such a problem, the dust collection unit 170 of the cleaner station 100 of the present invention includes a dust separator 171 to separate and collect dust from the air introduced through the flow path unit 180.

[0230] Specifically, the dust collection unit 170 may include the dust separator 171, the dust bag 172, the bag support 173, the dust bag cartridge 174, a prefilter 175, and the bonding unit 176.

[0231] The dust separator 171 may separate dust from the air introduced from the dust bin 220.

[0232] The dust separator 171 may be disposed above the dust bag 172, the bag support 173, the dust bag cartridge 174, and the bonding unit 176. That is, the dust bag 172, the bag support 173, the dust bag cartridge 174, and the bonding unit 176 may be disposed under the dust separator 171. The dust separator 171 may come into contact with the dust bag cartridge 174.

[0233] The dust separator 171 may be disposed on the axial line C of the cleaner station 100 in the longitudinal direction.

[0234] The dust separator 171 may include a dust separator case 171a.

[0235] The dust separator case 171a may form the appearance of the dust separator 171.

[0236] A cyclone may be provided inside the dust separator case 171a. That is, a cyclone unit 171b may be disposed inside the dust separator case 171a.

[0237] In addition, a dust through pipe 171c may be formed in the dust separator case 171a. For example, a flow path through which dust may pass may be formed on a bottom surface of the dust separator case 171a.

[0238] The bottom surface of the dust separator 171 may be formed to be inclined at a predetermined angle with respect to the ground. That is, the bottom surface of the dust separator case 171a may be formed to be inclined at a predetermined angle with respect to the ground. A height of the bottom surface of the dust separator 171 from the ground may gradually decrease from one side to the other side. For example, a height of the dust separation case 171a from the ground may gradually decrease rearward from the front end portion into which the dust bag cartridge 174 is inserted.

[0239] A sealer 171d in contact with the dust bag cartridge 174 may be provided on the bottom surface of the dust separator case 171a. For example, the sealer 171d may be disposed in a quadrangular shape surrounding the outer periphery of the dust through pipe 171c.

[0240] The dust separator 171 may communicate with the first flow path 181. The dust separator 171 may separate dust suctioned therein through the first flow path 181. The internal space of the dust separator 171 may communicate with an internal space of the dust bag cartridge 174. The internal space of the dust separator 171 may communicate with an internal space of the bag support 173.

[0241] For example, the dust separator 171 may include at least one cyclone unit 171b capable of separating dust by a cyclonic flow. Therefore, the air and dust introduced through the first flow path 181 flow spirally along the inner circumferential surface of the dust separator 171. Therefore, a cyclonic flow may occur in the internal space of the dust separator 171.

[0242] Meanwhile, in the present embodiment, the cyclone unit 171b may have a cylindrical mesh network. Here, the axial direction of the mesh network may be disposed parallel to the ground. With this configuration, when the cyclone unit 171b is pulled from the side surface of the cleaner station 100, the cyclone unit 171b may be separated from the dust collection unit 170. Therefore, according to the present embodiment, the user may easily separate the cyclone unit 171b and wash the mesh network.

[0243] In addition, the dust separator 171 may include the dust through pipe 171c that guides the dust separated from the cyclone unit 171b to the dust bag 172. The dust through pipe 171c may be formed downward from one side of the cyclone unit 171b in the axial direction. That is, the dust through pipe 171c may be formed under the dust separator case 171a. Therefore, a flow path formed in the dust through pipe 171c may allow the internal spaces of the dust bag cartridge 174 and the bag support 173 to communicate with the cyclone unit 171b.

[0244] The dust separator 171 may further include a secondary cyclone that re-separates dust from the air discharged from the cyclone. In this case, the secondary cyclone may be located inside the cyclone to minimize a size of the dust separator 171.

[0245] The dust separator 171 is a component that communicates with the first flow path 181 and adopts the principle of a dust collector using a centrifugal force to separate dust flowing into the housing 110 through the dust through hole 121a.

[0246] The dust bag 172 may be disposed inside the housing 110. The dust bag 172 may be disposed under the dust separator 171 in the direction of gravity.

[0247] The dust bag 172 may be formed of a non-permeable material. For example, the dust bag 172 may include a roll vinyl (not shown). With this configuration, when the dust bag 172 is sealed or bonded, dust or odor collected inside the dust bag 172 can be prevented from leaking out of the dust bag 172.

[0248] The dust bag 172 may be mounted on the housing 110 through the dust bag cartridge 174. As needed, the dust bag 172 may be replaced through the dust bag cartridge 174. That is, the dust collection unit 170 can be defined as a consumable component. A volume of the dust bag 172 may be increased by a suction force (negative pressure) generated when the dust collection motor 191 is operated while mounted in the housing 110.

[0249] In this case, the unfolded dust bag 172 may be accommodated inside the bag support 173. That is, the dust bag 172 may be expanded in the bag support 173 when the dust collection motor 191 is operated. In addition, the unfolded dust bag 172 may be supported by the bag support 173 to maintain its shape.

[0250] The dust bag 172 may store dust separated by the dust separator 171. An upper region of the dust bag 172 may be cut and bonded by the bonding unit 176. The dust bag 172 may be separated from the bag support 173 while the upper region is cut and bonded.

[0251] With this configuration, since the user does not need to separately tie the bag in which dust has been collected or the like, user convenience can be improved.

[0252] Meanwhile, in the case of a general roll vinyl type dust bag, the dust bag may be crushed flat while pulled toward the dust collection motor when the dust collection motor is operated. Therefore, it is difficult to collect dust in the dust bag as the internal space of the dust bag narrows when the dust collection motor is operated.

[0253] To solve such a problem, the dust collection unit 170 of the cleaner station 100 according to one embodiment of the present invention may add the bag support 173 so that the dust bag is stably unfolded.

[0254] The bag support 173 may support the dust bag 172. When the dust bag 172 is expanded, the bag support 173 may accommodate the dust bag 172 therein. The bag support 173 may support the appearance of the expanded dust bag 172.

[0255] The bag support 173 may be disposed under the dust separator 171. With this configuration, the dust separated by the dust separator 171 may be collected into the bag support 173.

[0256] The bag support 173 may be disposed under the dust bag cartridge 174. With this configuration, when the dust bag 172 is expanded downward from the dust bag cartridge 174, at least a portion of the dust bag 172 may be accommodated inside the bag support 173.

[0257] The bag support 173 may be disposed under the bonding unit 176. With this configuration, the expanded dust bag 172 may be bonded and separated by the bonding unit 176 and accommodated in the bag support 173 while falling downward by gravity.

[0258] Specifically, the bag support 173 may include a support main body 173a and an adsorption hole 173b.

[0259] A space may be formed between a bottom surface of the support main body 173a and the bottom surface of the

bag accommodation space 115. The space may provide a path along which the suction force of the dust collection motor 191 is transferred.

[0260] With this configuration, when the dust collection motor 191 is operated, the air in the bag accommodation space 115 may be suctioned into the dust collection motor 191 by the suction force of the dust collection motor 191, and a negative pressure for expanding the dust bag 172 may be generated in the bag accommodation space 115.

[0261] When the dust bag 172 expands, the support main body 173a may be formed to accommodate the dust bag 172 therein. For example, the support main body 173a may be formed in a cylindrical shape, a top surface of the support main body 173a may be opened, and at least a portion of the bottom surface of the support main body 173a may be formed in a closed shape.

[0262] As another example, the support main body 173a may be formed in a hexahedral shape, the top surface of the support main body 173a may be opened, and a front surface of the support main body 173a may be opened. With this configuration, the dust bag 172 may be removed through the open front surface.

[0263] At least a portion of the dust bag 172 may be disposed above the support main body 173a. In addition, when the dust bag 172 expands, the dust bag 172 expands downward to fill an internal space of the support main body 173a.

[0264] A plurality of adsorption holes 173b may be formed in the support main body 173a. For example, the plurality of adsorption holes 173b may be formed along an outer perimetric surface of the support main body 173a. In addition, at least one adsorption hole 173b may be formed in the bottom surface of the support main body 173a. With this configuration, when the dust collection motor 191 is operated, air inside the support main body 173a may flow outward from the support main body 173a through the adsorption holes 173b. In addition, while the dust bag 172 expands inside the support main body 173a, a negative pressure may be applied to the dust bag 172 outward from the support main body 173a, and the dust bag 172 may expand to come into close contact with an inner perimetric surface and bottom surface of the support main body 173a. That is, the dust bag 172 may expand along an internal shape of the bag support 173.

[0265] In particular, when the plurality of adsorption holes 173b are formed at predetermined intervals, a uniform negative pressure may be applied to the entire dust bag 172 so that the dust bag 172 may evenly expand to maintain the expanded shape.

[0266] Meanwhile, the bag support 173 may be disposed to be drawn out from the housing 110.

[0267] Specifically, the bag support 173 may be provided in the bag accommodation space 115 formed inside the housing 110. In this case, the bag support 173 may have a structure for guiding a linear movement of the bag support 173.

[0268] With this configuration, the user may open the side door (not shown) of the cleaner station 100 and then pull the bag support 173 to draw the dust bag 172 out of the housing 110. Therefore, according to the present invention, the user can easily take out the dust bag.

[0269] Meanwhile, in the case of a roll vinyl type cleaner station, it is necessary to replace the dust bag when all the consumable dust bag is exhausted. In this case, the user may directly insert and install a dust bag inside the housing of the cleaner station, but there is a risk of failure while the user opens the interior of the cleaner station, and in addition, when the dust bag is incorrectly installed, there is a problem that dust may be scattered due to dust collection with the dust bag folded.

[0270] To solve such a problem, in the present invention, the dust bag can be easily supplied by the user replacing only the cartridge through the dust bag cartridge 174.

[0271] The dust bag cartridge 174 may be separably coupled to the housing 110 to supply the dust bag 172.

[0272] 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 174e formed between the dust separator 171 and the bonding unit 176.

[0273] In this case, in the present invention, the cartridge coupling space 174e may be formed to have different heights in the vertical direction. For example, the cartridge coupling space 174e may have a height of the front in which the dust bag cartridge 174 enters the inside of the cleaner station 100 from the outside that is greater than the height of the rear.

[0274] When the user pulls the dust bag cartridge 174 outward from the cleaner station 100 while the dust bag cartridge 174 is coupled to the housing 110, the dust bag cartridge 174 may be separated from the housing 110. With this configuration, the user can easily mount or remove the dust bag cartridge 174 in and from the housing.

[0275] The dust bag cartridge 174 may be provided with the dust bag 172. For example, at least a portion of the roll vinyl-type dust bag 172 may be coupled to the dust bag cartridge 174, and the dust bag 172 may expand toward the bag support 173 according to the operation of the dust collection motor 191. In addition, according to the operation of the bonding unit 176 described below, some dust bags 172 may be separated from the dust bag cartridge 174 as the dust bag 172 is bonded. With this configuration, since the user does not need to separately tie the bag in which dust has been collected or the like, user convenience can be improved.

[0276] The dust bag cartridge 174 may be disposed under the dust separator 171. For example, the top surface of the dust bag cartridge 174 may come into contact with the bottom surface of the dust separator 171.

[0277] The dust bag cartridge 174 may be disposed above the bonding unit 176. For example, the bottom surface of the dust bag cartridge 174 may come into contact with a top surface of the bonding unit 176.

[0278] The dust bag cartridge 174 includes a cartridge case 174a, an upper sealer 174b, and a lower sealer 174c.

[0279] The cartridge case 174a forms the appearance of the dust bag cartridge 174, and the dust bag 172 may be accommodated therein. As an example, the cartridge case 174a may have an upper case and a lower case coupled to form a space in which the dust bag 172 is accommodated. In this case, the cartridge case 174a may entirely have a quadrangular pipe shape with the upper case and the lower case coupled (see FIG. 18). That is, an inside (central portion) of the cartridge case 174a may be formed with a space 174f in which air may flow. At least a portion of the dust bag 172 may expand through the space 174f.

[0280] A bag supply hole 174d through which the dust bag 172 may be drawn out may be formed in the cartridge case 174a. As an example, the bag supply hole 174d may be formed in an inner perimetric surface of the cartridge case 174a. With this configuration, while the dust bag 172 is drawn out, the space 174f formed at the central portion of the cartridge case 174a may be blocked by the dust bag 172. Therefore, when the dust collection motor 191 is operated, the dust bag 172 may be suctioned and expanded toward the dust collection motor 191.

[0281] The cartridge case 174a may be formed to a predetermined height. The height of the cartridge case 174a is smaller than a height of a front end of the cartridge coupling space 174e. The height of the cartridge case 174a is equal to a height of a rear end of the cartridge coupling space 174e.

[0282] With this configuration, the cartridge case 174a can be easily inserted into the front end of the cartridge coupling space 174e. In addition, while the cartridge case 174a is coupled to the cartridge coupling space 174e, the cartridge case 174a may be supported in contact with the bottom surface of the dust separator 171 and/or the top surface of the bonding unit 176.

[0283] Meanwhile, as described above, when a space is present between the dust bag cartridge and a nearby structure or when the dust bag cartridge is detachably formed, there is a problem that dust contained in the air may scatter through a separation space in which the dust bag cartridge is coupled.

[0284] To solve such a problem, in the cleaner station 100 according to one embodiment of the present invention, one or more sealers 174b and 174c may be provided in the dust bag cartridge 174 to seal a gap in which dust may scatter.

[0285] That is, the upper sealer 174b may be provided on the top surface of the cartridge case 174a. For example, the upper sealer 174b may be disposed in a quadrangular shape surrounding the outer periphery of the space 174f formed at the central portion of the cartridge case 174a. The upper sealer 174b can block leakage of foreign substances. With this configuration, foreign substances separated by the dust separator 171 may be collected into the dust bag 172 without leaking externally.

[0286] The lower sealer 174c may be provided on the bottom surface of the cartridge case 174a. For example, the lower sealer 174c may be disposed in a quadrangular shape surrounding the outer periphery of the space 174f formed at the central portion of the cartridge case 174a. The lower sealer 174c and the dust bag cartridge 174 can block leakage of foreign substances. With this configuration, it is possible to prevent foreign substances passing through the dust bag cartridge 174 from leaking between the dust bag cartridge 174 and the bonding unit 176.

[0287] The dust collection unit 170 may further include the prefilter 175. The prefilter 175 may be disposed on the second flow path 182 and may separate foreign substances from the air flowing through the second flow path 182. For example, the prefilter 175 may be disposed at an inlet side of the second flow path 182 to separate dust and the like contained in the air passing through the dust separator 171. With this configuration, it is possible to prevent foreign substances from flowing into the dust collection motor 191.

[0288] The prefilter 175 may be detachably coupled to the second flow path 182. The prefilter 175 may be detachably coupled to the second flow path 182 at the front of the cleaner station 100.

[0289] The dust collection unit 170 may further include the bonding unit 176.

[0290] The bonding unit 176 may be disposed under the dust bag cartridge 174. For example, the top surface of the bonding unit 176 may come into contact with the bottom surface of the dust bag cartridge 174. With this configuration, the bonding unit 176 may guide the attachment and detachment of the dust bag cartridge 174.

[0291] The bonding unit 176 may be disposed above the bag support 173. For example, the bottom surface of the bonding unit 176 may come into contact with the top surface of the bag support 173.

[0292] The bonding unit 176 may cut and bond the upper region of the dust bag 172 in which dust is collected. Specifically, the bonding unit 176 may be collected into a central region of the dust bag 172 to bond the upper region of the dust bag 172 with a hot wire. For example, the bonding unit 176 may include a first bonding member (not shown) and a second bonding member (not shown). The first bonding member (not shown) may move in a first direction through a first bonding driving unit, and the second bonding member (not shown) may move in a second direction perpendicular to the first direction through a second bonding driving unit.

[0293] With this configuration, dust collected from the outside may be collected inside the roll vinyl, and the roll vinyl may be automatically bonded. Therefore, since the user does not need to separately tie a bag in which dust has been collected, user convenience can be improved.

[0294] The bonding unit 176 includes a bonding unit case 176a, a sealer 176b, and a cartridge detection sensor 176c.

[0295] The bonding unit case 176a forms the appearance of the bonding unit. The bonding unit case 176a may be

disposed in the housing 110. For example, the bonding unit case 176a may be fixedly coupled to the housing 110.

[0296] The top surface of the bonding unit 176 may be formed to be inclined at a predetermined angle with respect to the ground. That is, the top surface of the bonding unit case 176a may be formed to be inclined at the predetermined angle with respect to the ground. Specifically, a height of the top surface of the bonding unit 176 from the ground may gradually increase from one side to the other side. For example, the height of the top surface of the bonding unit case 176a from the ground may gradually increase rearward from a front end portion into which the dust bag cartridge 174 is inserted.

[0297] With this configuration, a wide inlet of the cartridge coupling space 174e into which the dust bag cartridge 174 is inserted may be formed, and when the dust bag cartridge 174 is completely inserted into the cartridge coupling space 174e, the bonding unit 176 may support the dust bag cartridge 174.

[0298] The sealer 176b in contact with the dust bag cartridge 174 may be disposed on the top surface of the bonding unit case 176a. For example, the sealer 176b may be disposed in a quadrangular shape surrounding the outer periphery of the flow path unit 180. The sealer 176b may block foreign substances from leaking between the bonding unit 176 and the dust bag cartridge 174.

[0299] Meanwhile, when the dust bag cartridge 174 is not mounted at a correct position of the housing 110, sealing by a sealer may not be performed. When the dust collection motor 191 is operated in such a situation, a large amount of dust may scatter and cause a failure of internal components of the cleaner station 100.

[0300] That is, it is necessary to prevent the dust bag cartridge 174 from being incorrectly mounted and detect whether the dust bag cartridge 174 has been correctly mounted.

[0301] To solve such a problem, the cleaner station 100 according to one embodiment of the present invention further includes the cartridge detection sensor 176c.

[0302] The cartridge detection sensor 176c may be disposed on the top surface of the bonding unit case 176a. For example, the top surface of the bonding unit case 176a may include a front top surface, a rear top surface, a left top surface, and a right top surface. Here, the front top surface may be a surface disposed at the front of the cleaner station into which the dust bag cartridge is inserted among the top surfaces, the rear top surface may be a surface disposed at the rear of the cleaner station among the top surfaces, the left top surface may be a surface disposed at the left of the cleaner station among the top surfaces, and the right top surface may be a surface disposed at the right of the cleaner station among the top surfaces.

[0303] In this case, the cartridge detection sensor 176c may be disposed the left top surface or right top surface of the bonding unit case 176a. In addition, the cartridge detection sensor 176c may be disposed at an intermediate position in a front-rear direction of the cleaner station 100. In addition, the cartridge detection sensor 176c may be disposed outside the sealer 176b.

[0304] With this configuration, the cartridge detection sensor 176c may be disposed without interfering with movement paths of the first bonding member (not shown) and the second bonding member (not shown).

[0305] 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. As an example, the cartridge detection sensor 176c may include a micro switch.

[0306] With this configuration, when the dust bag cartridge 174 is inserted into the cartridge coupling space 174e, the cartridge detection sensor 176c may come into contact with the dust bag cartridge 174 and detect that the dust bag cartridge 174 has been coupled.

[0307] Meanwhile, although not shown, the dust collection unit 170 may further include a dust amount sensor (not shown). The dust amount sensor may measure the amount of dust in the dust bag 172.

[0308] The cleaner station 100 may include the flow path unit 180. The flow path unit 180 may connect the cleaner 200 to the dust collection unit 170 and the dust collection motor 191.

[0309] The flow path unit 180 may include the first flow path 181, the second flow path 182, and the bypass flow path 183.

[0310] The first flow path 181 may connect the dust bin 220 of the cleaner 200 to the dust collection unit 170. The first flow path 181 may be disposed at the rear of the coupling surface 121. The first flow path 181 may be a space between the dust bin 220 of the cleaner 200 and the dust collection unit 170. The first flow path 181 may be a space formed rearward from the dust through hole 121a and may be a flow path formed downward from the dust through hole 121a so that dust and air may flow therethrough.

[0311] For example, the first flow path 181 may include a first region 181a communicating with the internal space of the dust bin 220 and a second region 181b allowing the first region 181a to communicate with the bag accommodation space 115 (or the internal space of the dust collection unit 170) when the cleaner 200 is coupled to the cleaner station 100 to open the dust through hole 121a. In this case, a direction in which the first region 181a is formed may be disposed substantially parallel to 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 a direction parallel to the axial line C of the housing 110 in the longitudinal direction. In this case, the first region 181a may be formed to form a predetermined angle with the second region 181b. With this configuration, it is possible to minimize the decrease in suction force of the dust collection motor 191 in the first region 181 and the second flow path 182.

[0312] Therefore, when the dust collection motor 191 is operated, dust in the dust bin 220 of the cleaner 200 may flow to the dust collection unit 170 through the first flow path 181.

[0313] The second flow path 182 may connect the dust collection unit 170 to the dust suction module 190. Specifically, the second flow path 182 may be a flow path connecting the top of the dust collection unit 170 to the top of the dust suction module 190.

[0314] With this configuration, air passing through the dust collection unit 170 through the second flow path 182 may be guided to the dust collection motor 191.

[0315] The bypass flow path 183 may connect the bag support 150 to the dust collection motor 191 in a flow path manner.

[0316] The bypass flow path 183 may allow the bag accommodation space 115 to communicate with the internal space of the dust suction module 190. For example, the bypass flow path 183 may be a flow path formed along the direction of gravity to connect the bag accommodation space 115 to the dust suction module 190. With this configuration, the bypass flow path 183 may guide the air present in the bag accommodation space 115 to the dust collection motor 191.

[0317] The second flow path 182 and the bypass flow path 183 may communicate with each other to be connected to the dust suction module 190. As an example, the second flow path 182 may be connected to the bypass flow path 183, and the bypass flow path 183 may be connected to the dust suction module 190. As another example, the second flow path 182 may be connected to the bypass flow path 183, 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 183 may be connected to the dust collection unit 170 and the dust collection motor 191, respectively.

[0318] With this configuration, it is possible to maintain the shape of the dust bag by operating the dust collection motor 191 and at the same time, suction external air.

[0319] The cleaner station 100 may include the dust suction module 190. The dust suction module 190 may include the dust collection motor 191.

[0320] The dust collection motor 191 may be disposed under the dust collection unit 170. The dust collection motor 191 may generate a suction force in the flow path unit 180. Therefore, the dust collection motor 191 may provide a suction force capable of suctioning the dust in the dust bin 220 of the cleaner 200.

[0321] The dust collection motor 191 may generate the suction force by rotation. As an example, the dust collection motor 191 may be formed in a shape similar to a cylinder and may generate a suction force while rotating about a rotational axis. In this case, a direction of the rotational axis of the dust collection motor 191 may be perpendicular to the ground.

[0322] Meanwhile, FIG. 13 shows a block diagram for describing a control configuration in the cleaner station according to the embodiment of the present invention.

[0323] The control configuration of the cleaner station 100 according to the present invention will be described with reference to FIG. 13 as follows.

[0324] The cleaner station 100 according to the embodiment of the present invention may further include a controller 400 for controlling the coupling unit 120, the fixing unit 130, the door unit 140, the cover opening unit 150, the dust collection unit 170, the flow path unit 180, and the dust suction module 190.

[0325] The controller 400 may be composed of a printed circuit board and elements mounted on the printed circuit board.

[0326] 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 has been coupled to the coupling unit 120. In this case, the controller 400 may receive the signal of the coupling sensor 125 and determine that the cleaner 200 has been coupled to the coupling unit 120.

[0327] In addition, when the charging unit 128 supplies power to the battery 240 of the cleaner 200, the controller 400 may determine that the cleaner 200 has been coupled to the coupling unit 120.

[0328] When determining that the cleaner 200 has been coupled to the coupling unit 120, the controller 400 may fix the cleaner 200 by operating the fixing unit motor 133.

[0329] When the fixing member 131 or the fixing unit link (not shown) moves to a predetermined fixing point FP1, a fixing detection unit 137 may transmit a signal indicating that the cleaner 200 has been fixed. The station controller 400 may receive the signal indicating that the cleaner 200 has been fixed from the fixing detection unit 137 and determine that the cleaner 200 has been fixed. When it is determined that the cleaner 200 has been fixed, the station controller 400 may stop the operation of the fixing unit motor 133.

[0330] Meanwhile, when the emptying of the dust bin 200 is finished, the controller 400 may release the fixing of the cleaner 200 by rotating the fixing unit motor 133 in the reverse direction.

[0331] When it is determined that the cleaner 200 has been fixed to the coupling unit 120, the controller 400 may open the door 141 of the cleaner station 100 by operating the door motor 142.

[0332] The door opening and closing detector 144 may transmit a signal indicating that the door 141 has been opened when the door 141 or the door arm 143 reaches the predetermined opening position DP1. The controller 400 may receive the signal indicating that the door 141 has been opened from the door opening and closing detector 137 and determine that the door 141 has been opened. When it is determined that the door 141 has been opened, the controller 400 may stop the operation of the door motor 142.

[0333] Meanwhile, when the emptying of the dust bin 200 is finished, the controller 400 may close the door 141 by

rotating the door motor 142 in the reverse direction.

[0334] When it is determined that the door 141 has been opened, the controller 400 may open the discharge cover 222 of the cleaner 200 by operating the cover opening motor 152.

[0335] The cover opening detector 155f may transmit a signal indicating that the discharge cover 222 has been opened when a guide frame 351e reaches a predetermined open position CP1. The controller 400 may receive the signal indicating that the discharge cover 222 has been opened from the cover opening detection part 155f and determine that the discharge cover 222 has been opened. When it is determined that the discharge cover 222 has been opened, the controller 400 may stop the operation of the cover opening motor 152.

[0336] The controller 400 may drive the bonding unit 176 to bond the dust bag 172. For example, the controller 400 may operate the first bonding member to move in the first direction, and the controller 400 may operate the second bonding member to move in the second direction perpendicular to the first direction.

[0337] Meanwhile, in the present embodiment, the controller 400 may operate the bonding unit 176 after the operation of the dust collection motor 191 is finished. As an example, the controller 400 may operate the bonding unit 176 when a predetermined time elapses after the operation of the dust collection motor 191 is finished. As another example, the controller 400 may operate the bonding unit 176 when a predetermined time elapses after the dust collection motor 191 is operated a predetermined number of times. As still another example, the controller 400 may operate the bonding unit 176 every preset cycle, and when the dust collection motor 191 is in operation, the bonding unit 176 may be operated when a predetermined time elapses. In addition, the controller 400 may operate the bonding unit 176 when the amount of dust measured through the dust amount sensor (not shown) exceeds a predetermined reference.

[0338] With this configuration, it is possible to improve hygiene by sealing the dust bag 172 while the dust is settled in the dust bag 172 without floating inside the cleaner station 100.

[0339] Meanwhile, in the present embodiment, the controller 400 may determine whether the dust bag cartridge 174 is mounted through the cartridge detection sensor 176c. When the cartridge detection sensor 176c comes into contact with the dust bag cartridge 174, the cartridge detection sensor 176c may transmit the above contact to the controller 400. In this case, the controller 400 may control the dust collection motor 191 to operate only when the dust bag cartridge 174 is mounted.

[0340] With this configuration, the controller 400 may the dust bin 220 to collect dust only while the dust bag 172 is provided in the cleaner station 100. Therefore, since dust is collected without the dust bag 172, it is possible to prevent foreign substances from contaminating the inside of the cleaner station 100 and causing a failure of the cleaner station 100.

[0341] The controller 400 may suction the dust inside the dust bin 220 by driving the dust collection motor 191.

[0342] The controller 400 may display a dust bin emptying situation and charging situation of the cleaner 200 by operating a display unit 410. For example, in the present embodiment, when the amount of dust measured by the dust amount sensor exceeds a predetermined reference value, the controller 400 may display the fact that the dust bag 172 needs to be replaced on the display unit 410.

[0343] Meanwhile, the cleaner station 100 according to the present invention may include the display unit 410.

[0344] The display unit 410 may be disposed not only in the housing 110, but also in a separate display device and provided in a terminal such as a mobile phone.

[0345] The display unit 410 may include at least one of a display panel capable of outputting text and/or graphics, and a speaker capable of outputting voice signals and sounds. A user can easily understand a situation, remaining time, and the like of a current ongoing stroke through the information output through the display unit.

[0346] Meanwhile, the cleaner station 100 according to the embodiment of the present invention may include a memory 430. The memory 430 may include various data for driving and operating the cleaner station 100.

[0347] Meanwhile, the cleaner station 100 according to the embodiment of the present invention may include an input unit 440. The input unit 440 generates key input data that the user inputs to control the operation of the cleaner station 100. To this end, the input unit 440 may be composed of a key pad, a dome switch, a touch pad (static pressure/electrostatic), and the like. In particular, when the touch pad forms a layered structure with the display unit 410, this may be referred to as a touch screen.

[0348] Although the present invention has been described in detail through specific embodiments, this is intended to specifically describe the present invention, and it is apparent that the present invention is not limited thereto, and the present invention can be modified or improved by those skilled in the art without departing from the technical spirit of the present invention.

[0349] All simple modifications or changes of the present invention fall within the scope of the present invention, and the specific scope of the present invention will be made clear by the appended claims.

DESCRIPTION OF REFERENCE NUMERALS

[0350]

	1:	cleaner system	100:	cleaner station
	110:	housing	120:	coupling unit
	130:	fixing unit	140:	door unit
5	150:	cover opening unit	170:	dust collection unit
	171:	dust separator	172:	dust bag
	173:	bag support	173a:	support main body
	173b:	adsorption hole	173c:	wheel
10	174:	dust bag cartridge	175:	prefilter
	176:	bonding unit	180:	flow path unit
	181:	first flow path	182:	second flow path
	183:	bypass flow path	190:	dust suction module
	191:	dust collection motor	200:	cleaner
15	400:	controller		

Claims

20 1. A cleaner station comprising:

a housing;
a coupling unit disposed in the housing and including a coupling surface to which at least a portion of a cleaner is coupled;
25 a dust collection unit accommodated inside the housing, disposed under the coupling unit, and collecting dust inside a dust bin of the cleaner; and
a dust collection motor accommodated inside the housing, disposed under the dust collection unit, and suctioning the dust inside the dust bin,
30 wherein the dust collection unit includes:

a dust separator that separates dust in the air introduced from the dust bin;
a dust bag that stores dust separated by the dust separator;
a bag support that accommodates the dust bag; and
35 a dust bag cartridge separably coupled under the dust separator and supplying the dust bag, and
a bottom surface of the dust separator is formed to be inclined at a predetermined angle with the ground.

2. The cleaner station of claim 1, wherein the bottom surface of the dust separator has a sealer in contact with the dust bag cartridge.

40 3. The cleaner station of claim 1, wherein a height of the bottom surface of the dust separator from the ground gradually decreases rearward from a front end portion into which the dust bag cartridge is inserted.

4. A cleaner station comprising:

45 a housing;
a coupling unit disposed in the housing and including a coupling surface to which at least a portion of a cleaner is coupled;
a dust collection unit accommodated inside the housing, disposed under the coupling unit, and collecting dust inside a dust bin of the cleaner; and
50 a dust collection motor accommodated inside the housing, disposed under the dust collection unit, and suctioning the dust inside the dust bin,
wherein the dust collection unit further includes:

55 a dust separator that separates dust in the air introduced from the dust bin;
a dust bag that stores dust separated by the dust separator;
a bag support that accommodates the dust bag;
a dust bag cartridge separably coupled under the dust separator and supplying the dust bag; and
a bonding unit disposed under the dust bag cartridge and bonding the dust bag,

a top surface of the bonding unit is formed to be inclined at a predetermined angle with the ground.

5. The cleaner station of claim 4, wherein the top surface of the bonding unit has a sealer in contact with the dust bag cartridge.

6. The cleaner station of claim 4, wherein a height of the top surface of the bonding unit from the ground gradually increases rearward from a front end portion into which the dust bag cartridge is inserted.

7. A cleaner station comprising:

a housing;
a coupling unit disposed in the housing and including a coupling surface to which at least a portion of a cleaner is coupled;
a dust collection unit accommodated inside the housing, disposed under the coupling unit, and collecting dust inside a dust bin of the cleaner; and
a dust collection motor accommodated inside the housing, disposed under the dust collection unit, and suctioning the dust inside the dust bin,
wherein the dust collection unit further includes:

a dust separator that separates dust in the air introduced from the dust bin;
a dust bag that stores dust separated by the dust separator;
a bag support that accommodates the dust bag; and
a dust bag cartridge separably coupled under the dust separator and supplying the dust bag, and
the dust bag cartridge includes:

a cartridge case; and
at least one sealer provided in the cartridge case.

8. The cleaner station of claim 7, wherein the sealer includes an upper sealer provided on a top surface of the cartridge case.

9. The cleaner station of claim 7, wherein the dust bag cartridge includes a lower sealer provided on a bottom surface of the cartridge case.

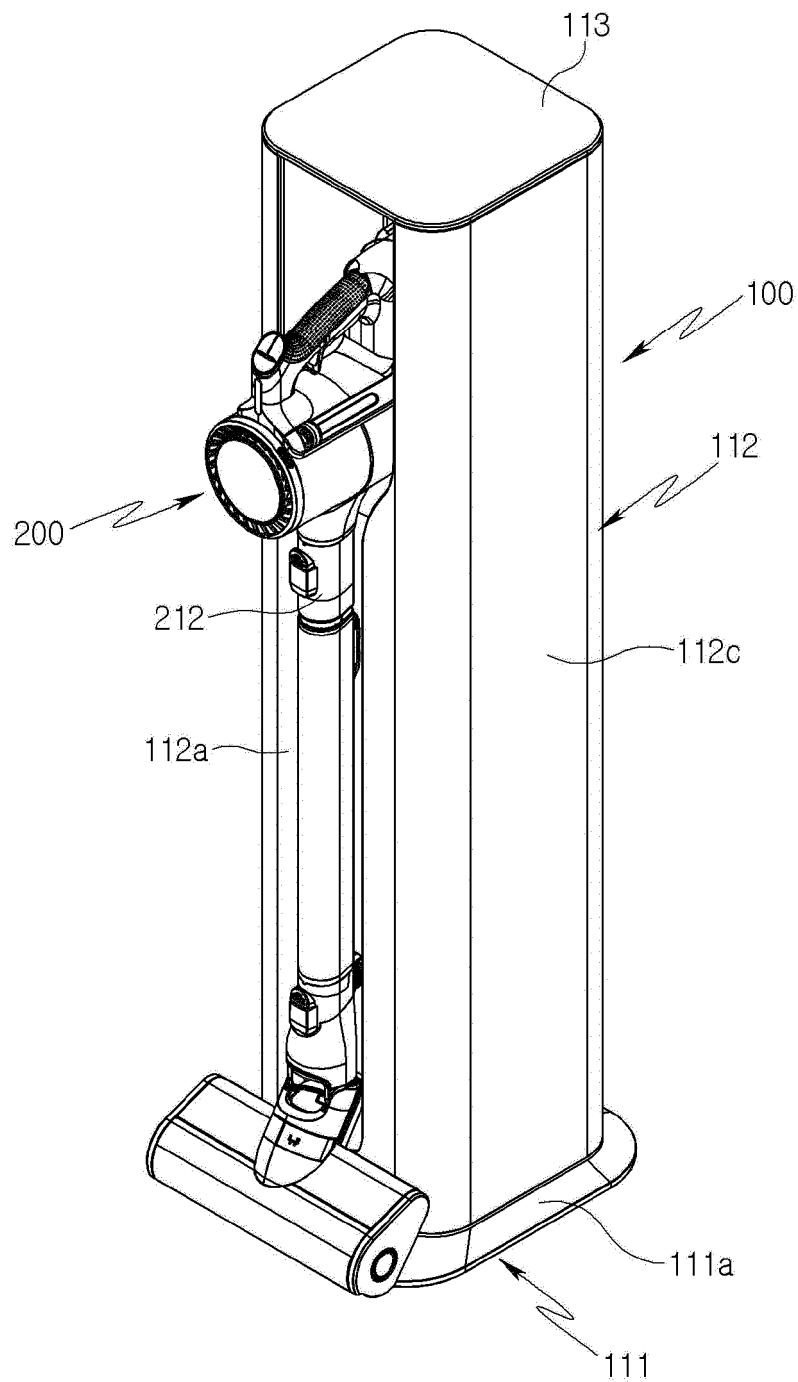
10. A cleaner station comprising:

a housing;
a coupling unit disposed in the housing and including a coupling surface to which at least a portion of a cleaner is coupled;
a dust collection unit accommodated inside the housing, disposed under the coupling unit, and collecting dust inside a dust bin of the cleaner; and
a dust collection motor accommodated inside the housing, disposed under the dust collection unit, and suctioning the dust inside the dust bin,
wherein the dust collection unit further includes:

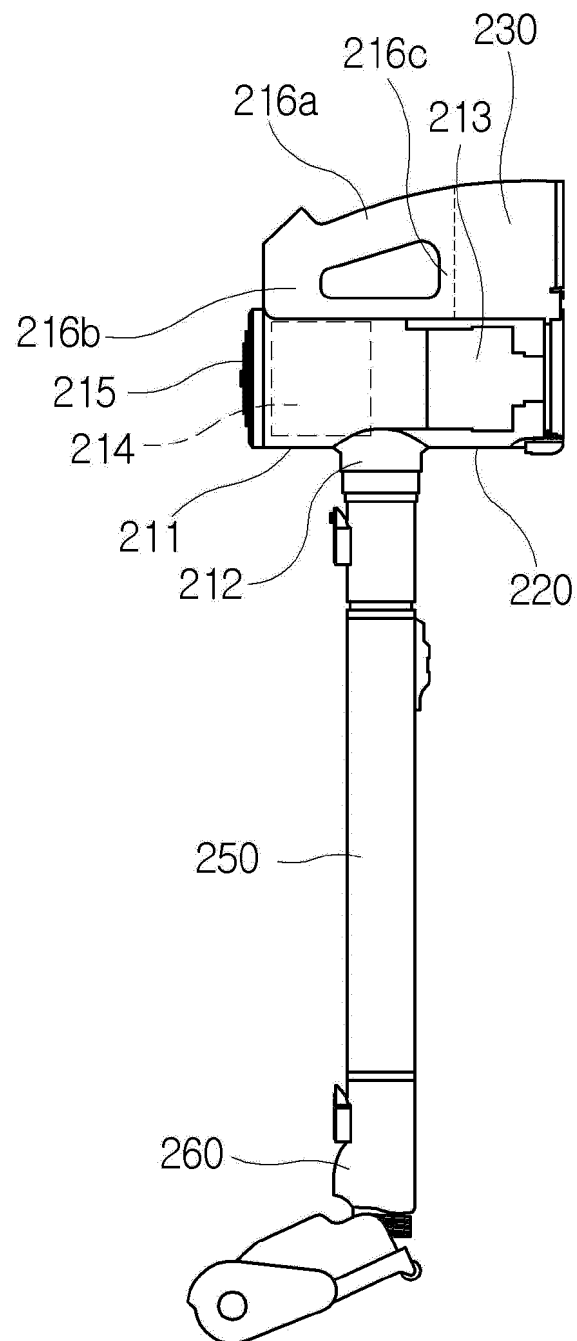
a dust separator that separates dust in the air introduced from the dust bin;
a dust bag that stores dust separated by the dust separator;
a bag support that accommodates the dust bag;
a dust bag cartridge separably coupled under the dust separator and supplying the dust bag; and
a bonding unit disposed under the dust bag cartridge and bonding the dust bag, and
the bonding unit includes:

a bonding unit case; and
a cartridge detection sensor provided on a top surface of the bonding unit case and detecting whether the dust bag cartridge is coupled.

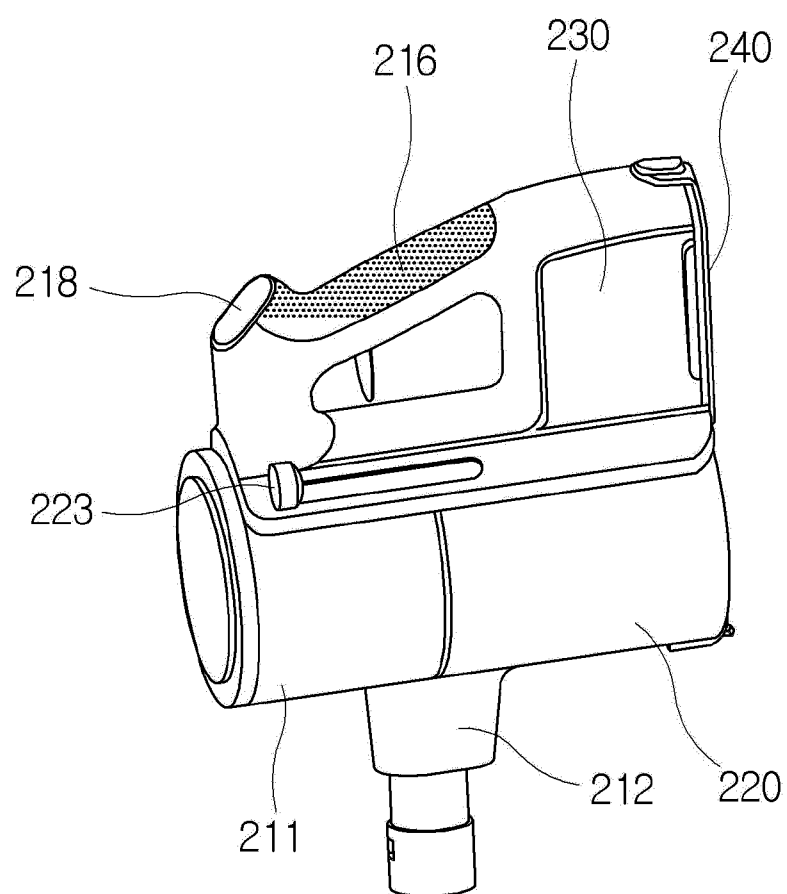
【FIG. 1】



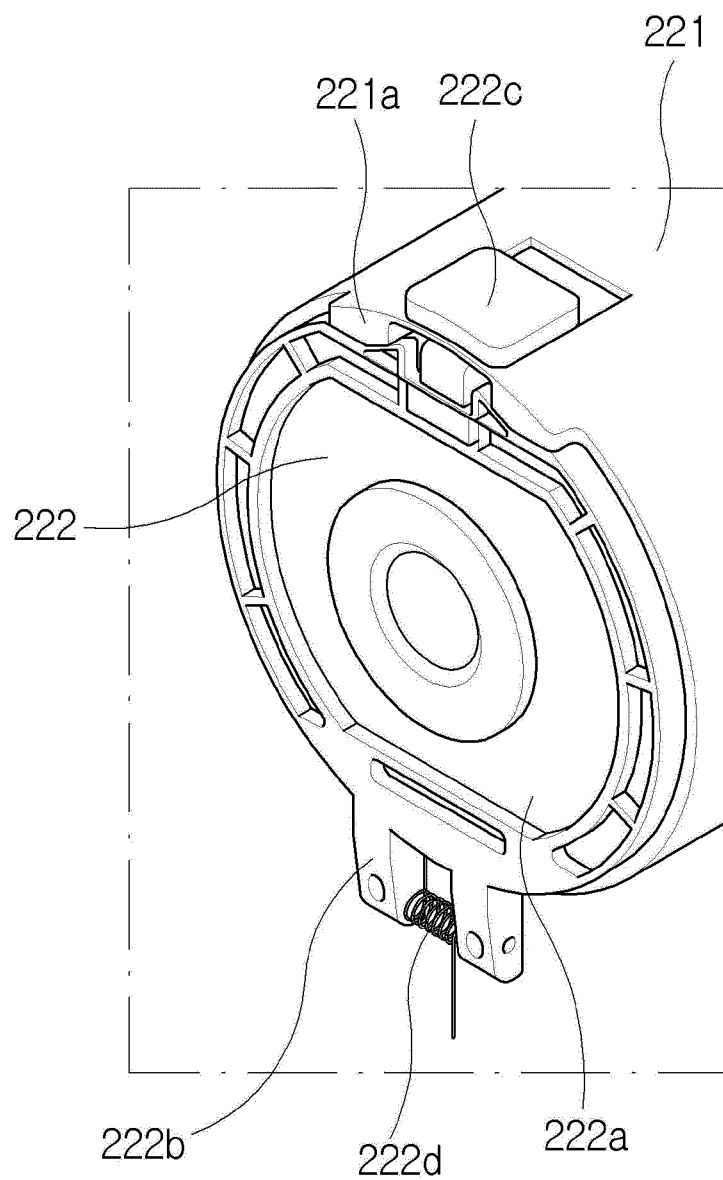
【FIG. 2】



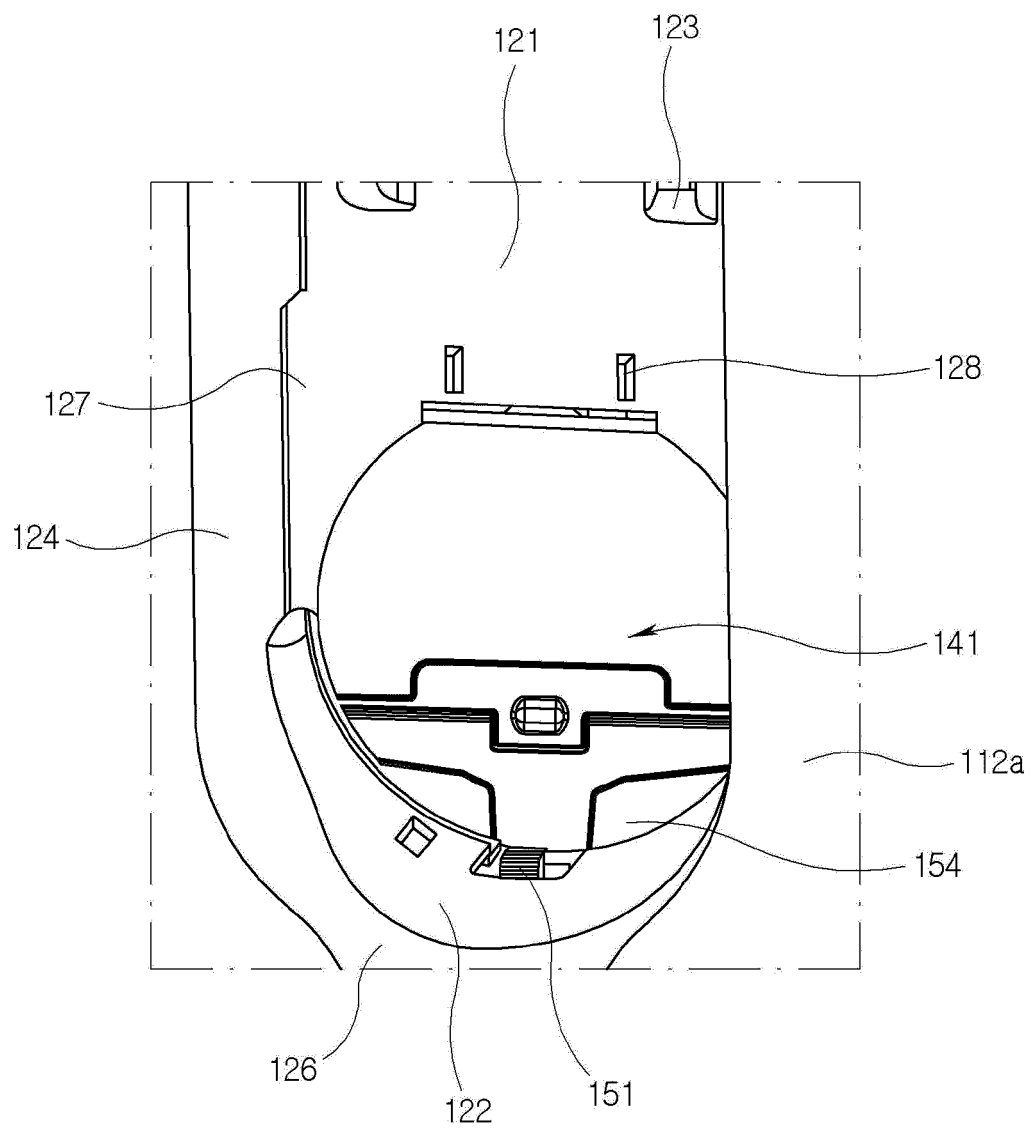
【FIG. 3】



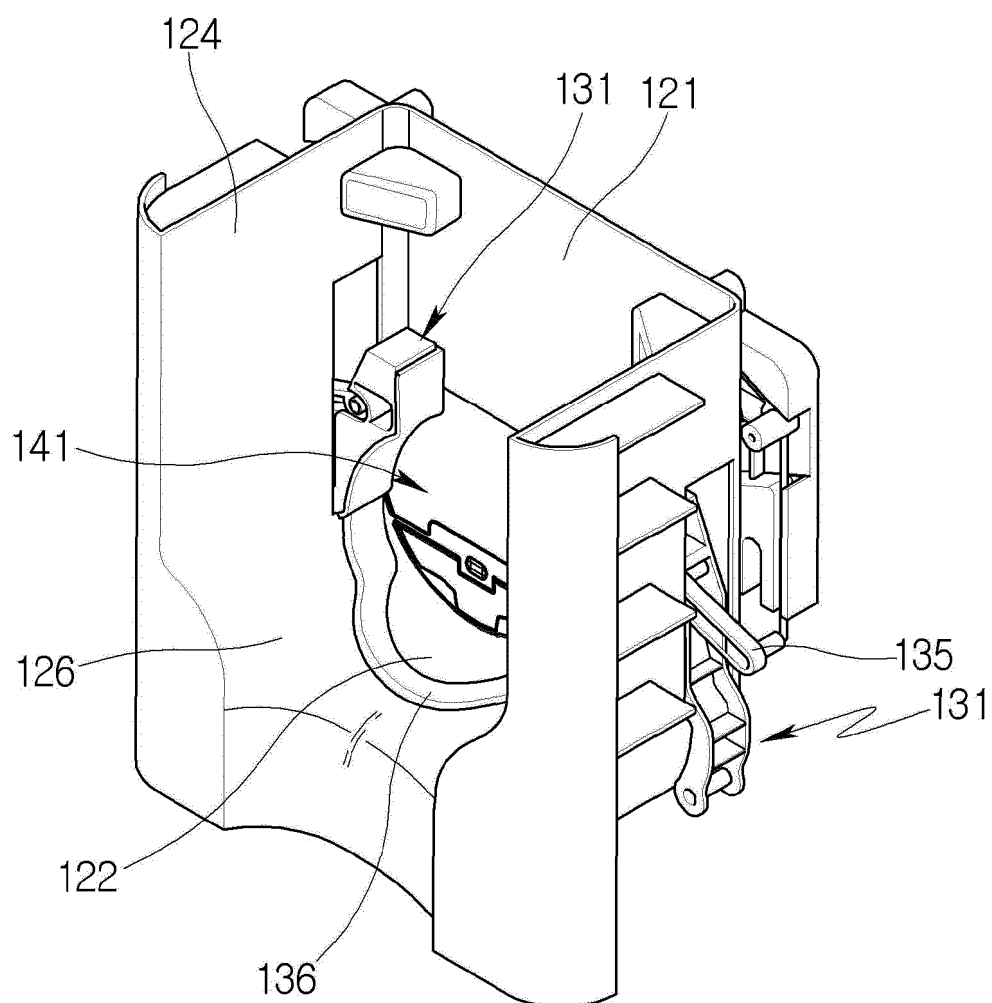
【FIG. 4】



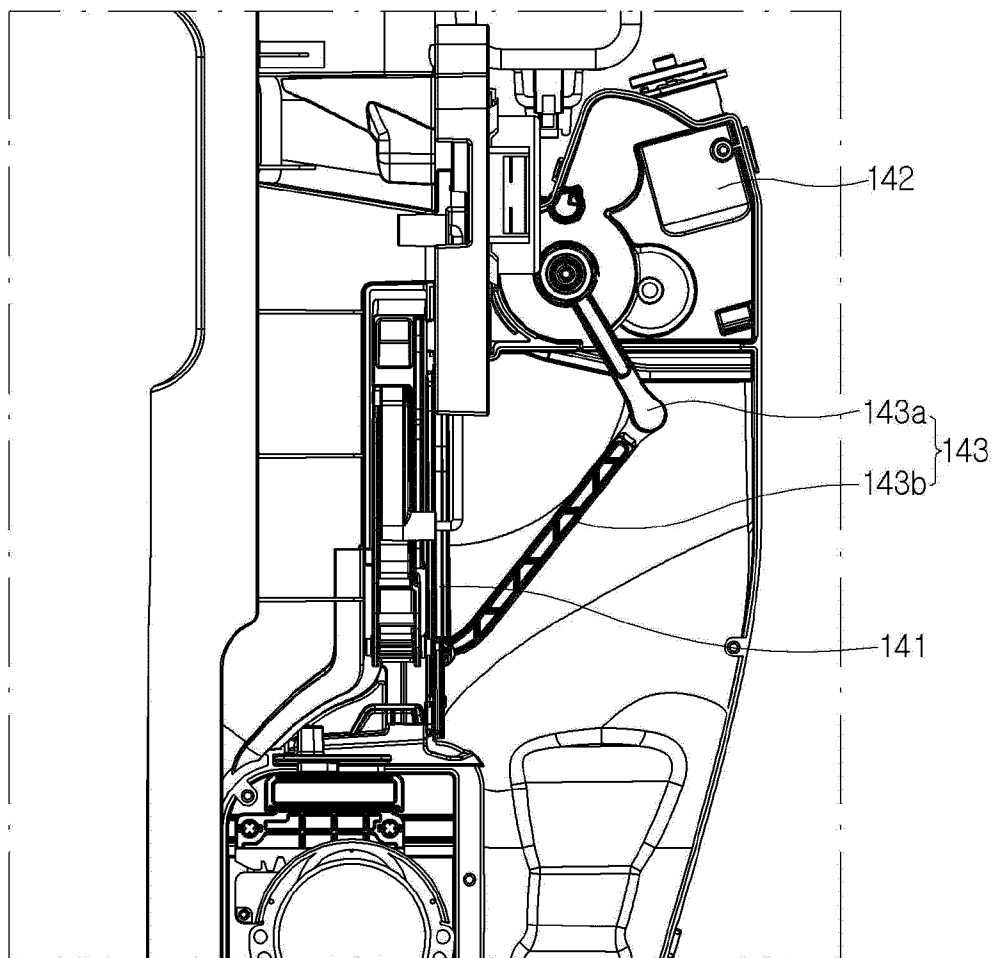
【FIG. 5】



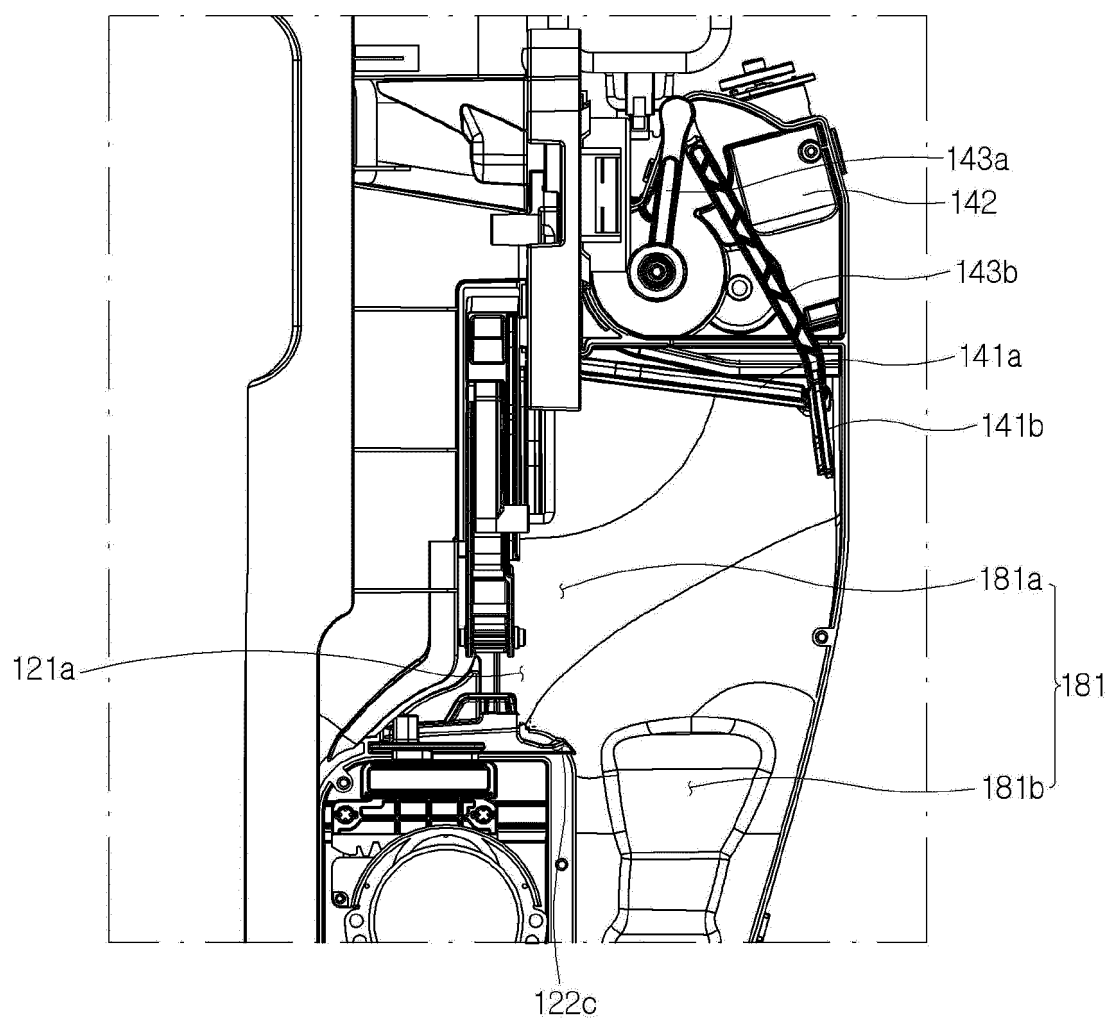
【FIG. 6】



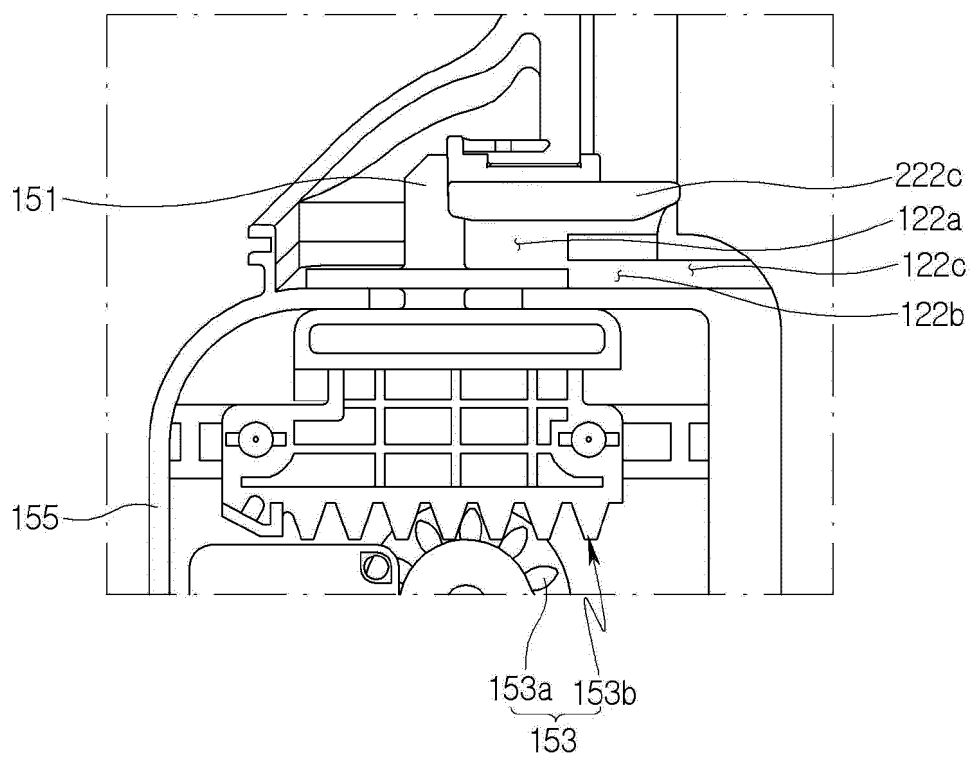
【FIG. 7】



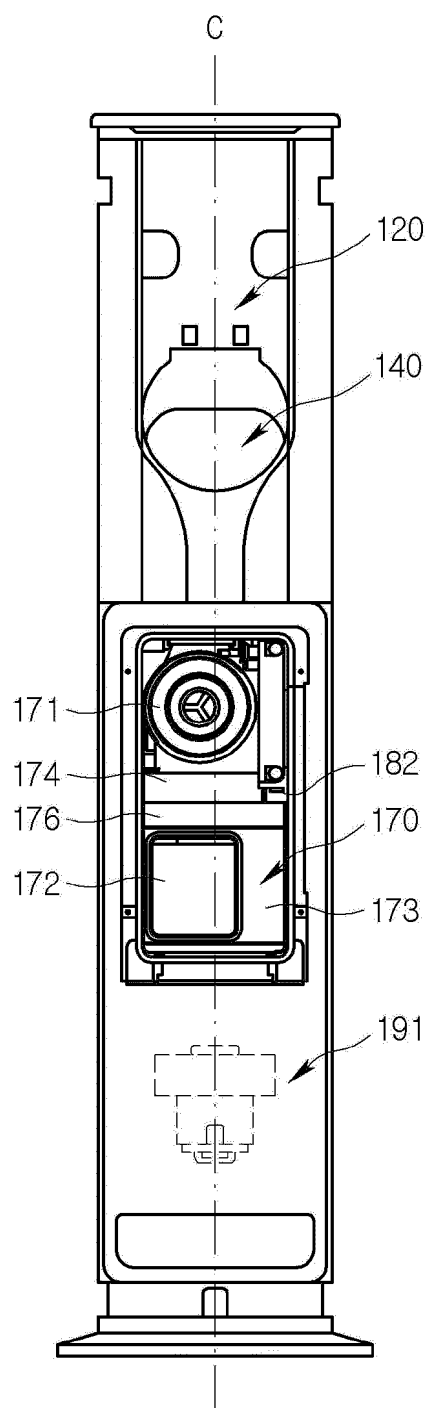
【FIG. 8】



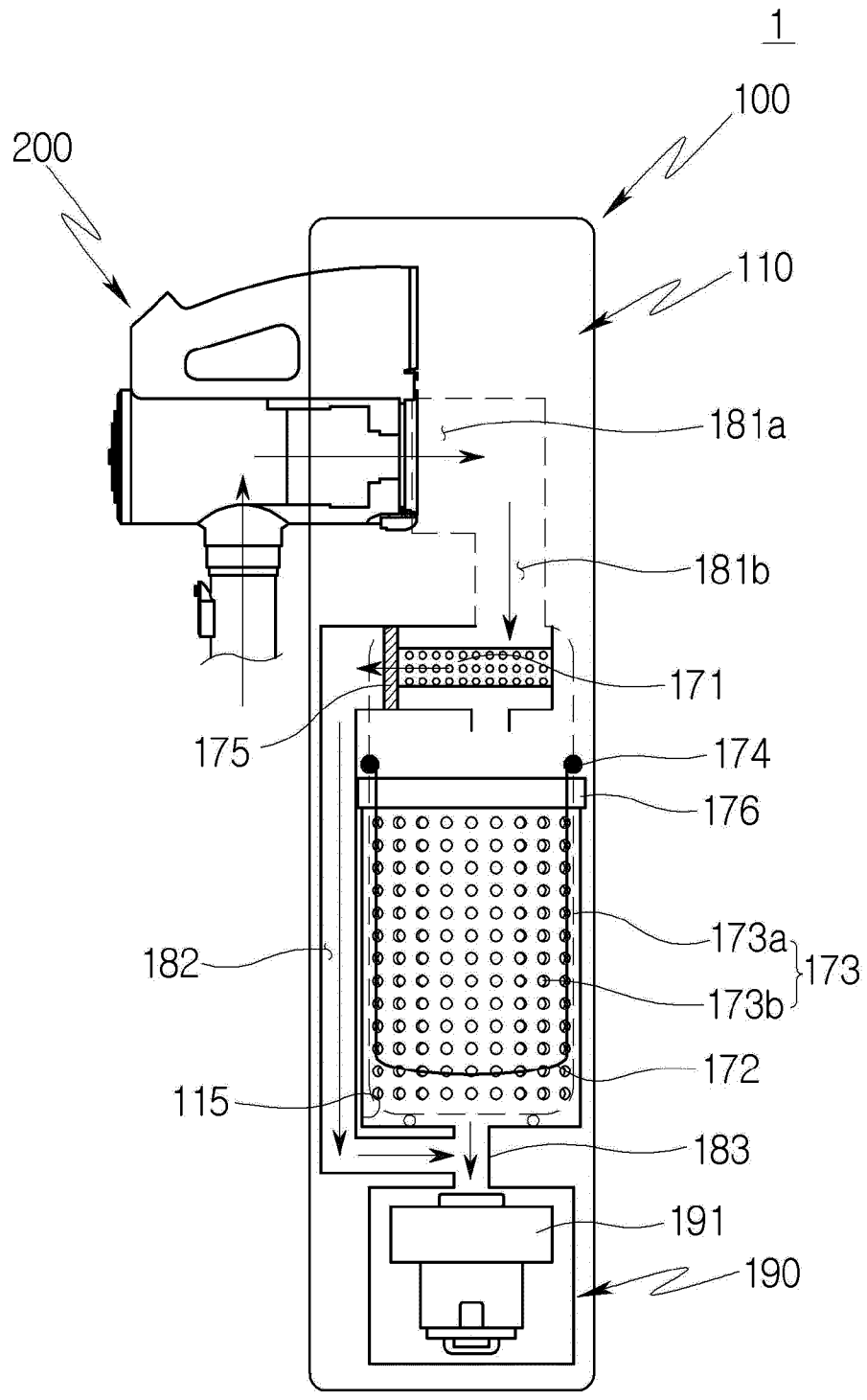
【FIG. 9】



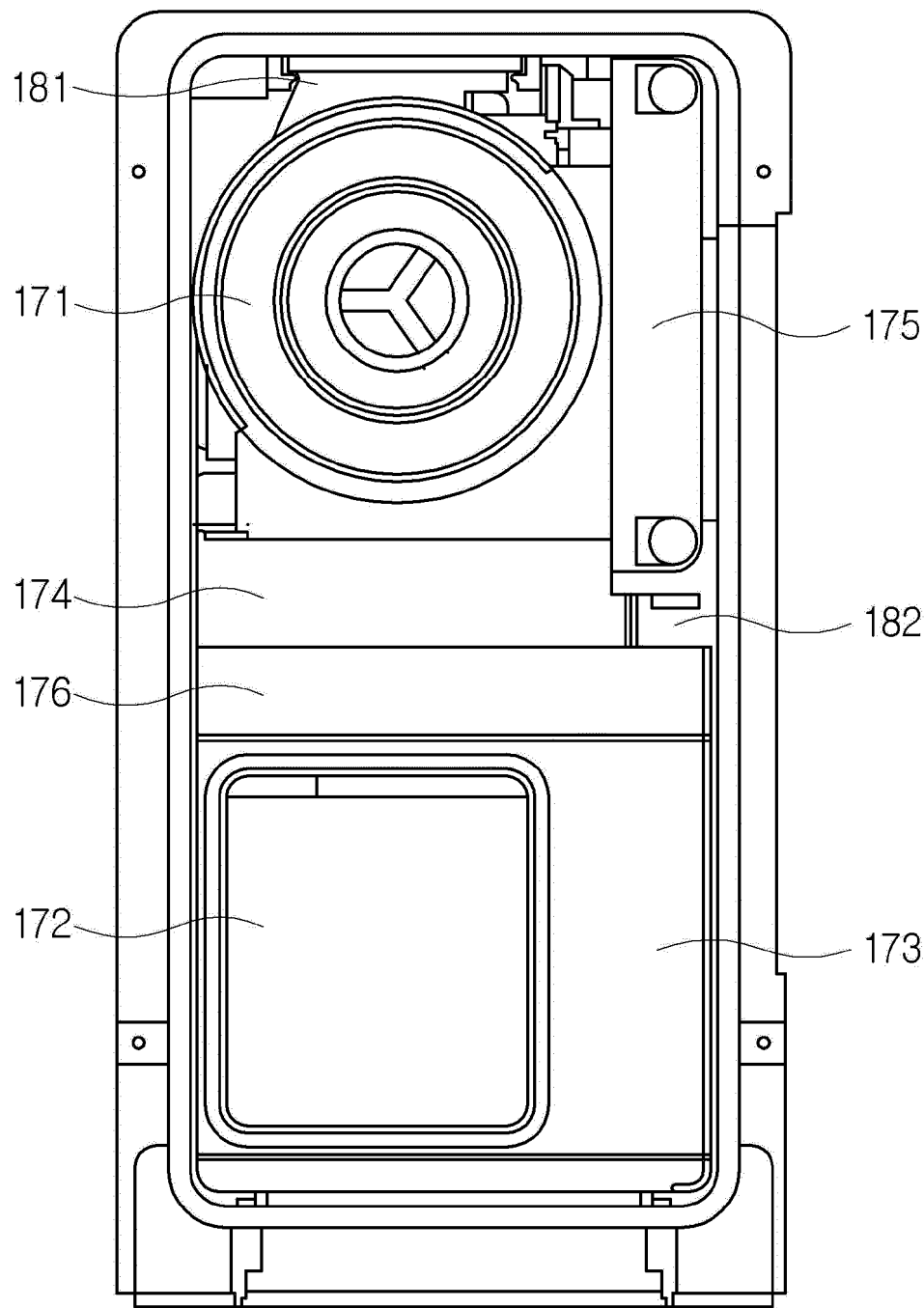
【FIG. 10】



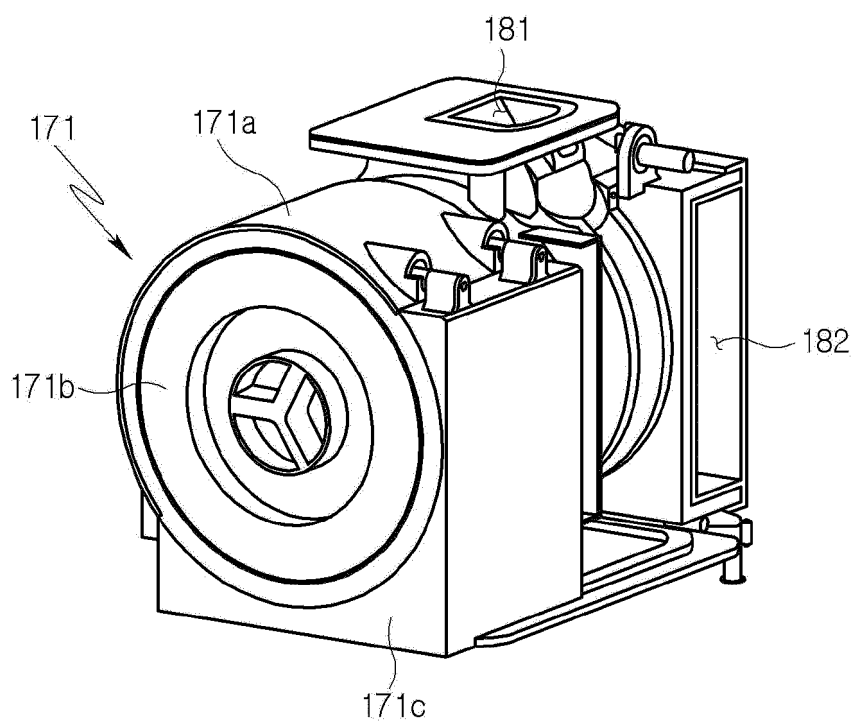
【FIG. 11】



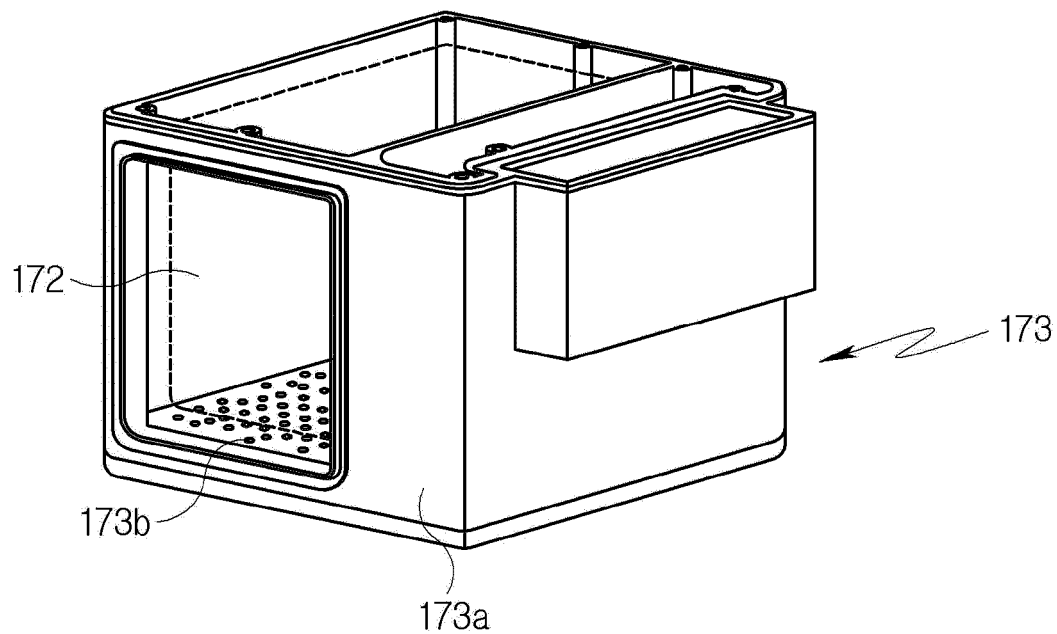
【FIG. 12】



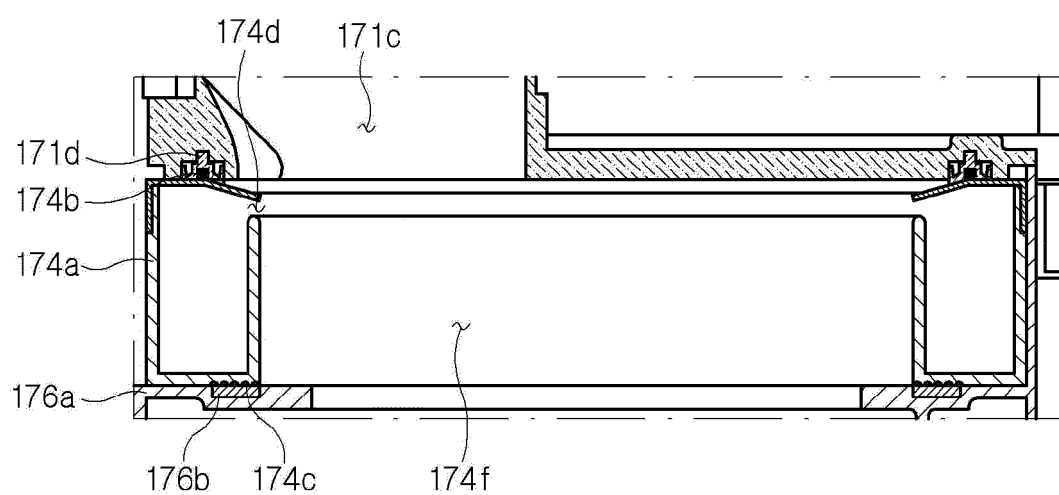
【FIG. 13】



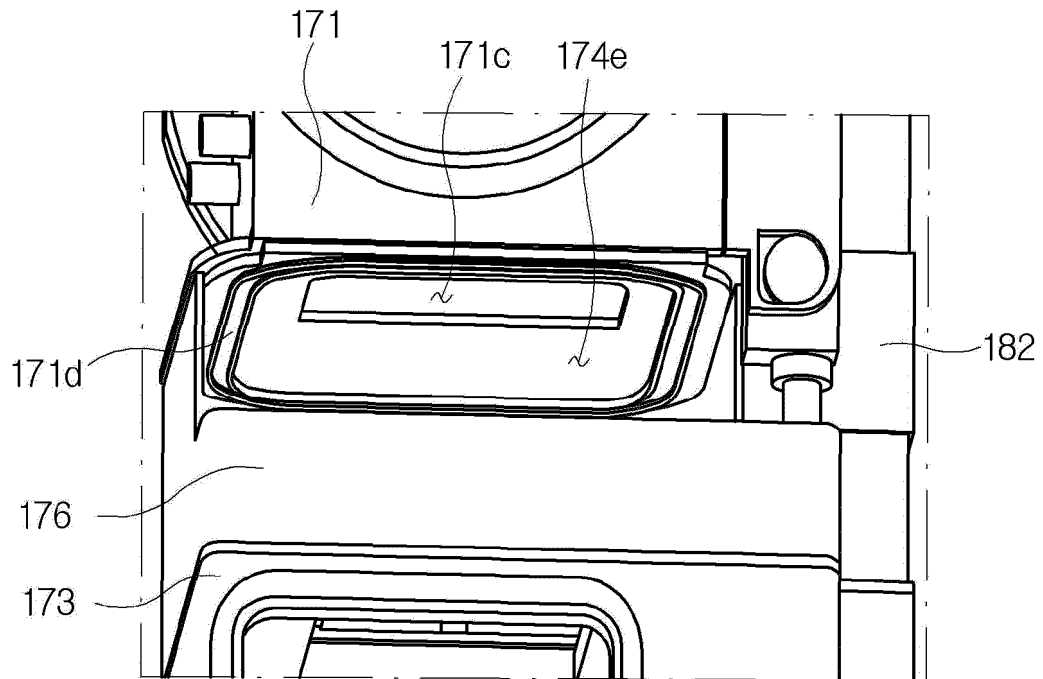
【FIG. 14】



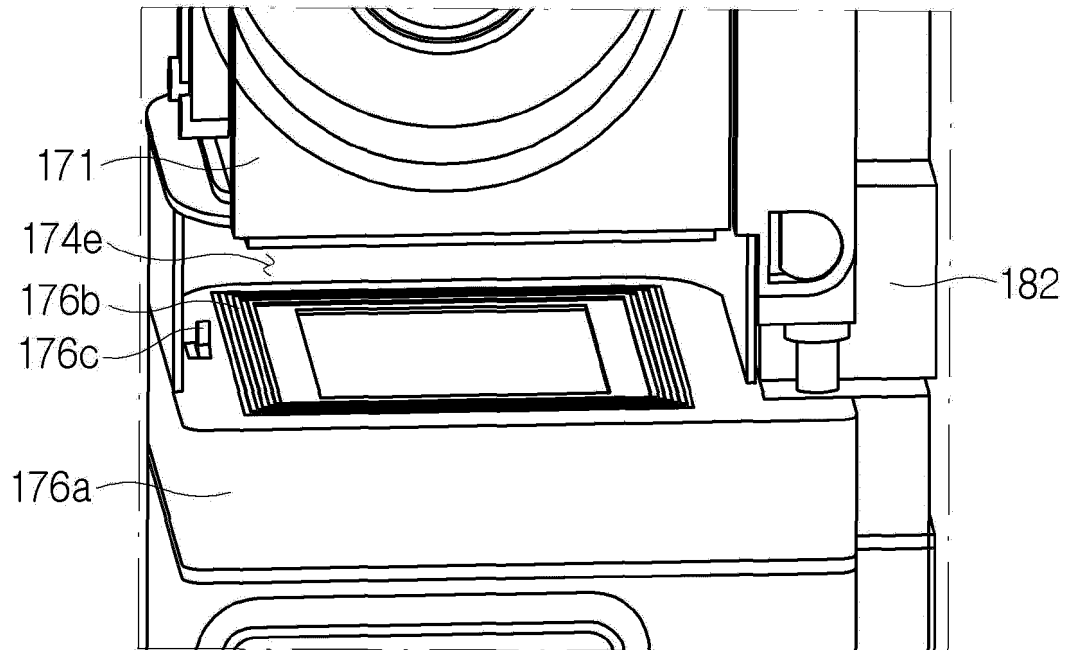
【FIG. 15】



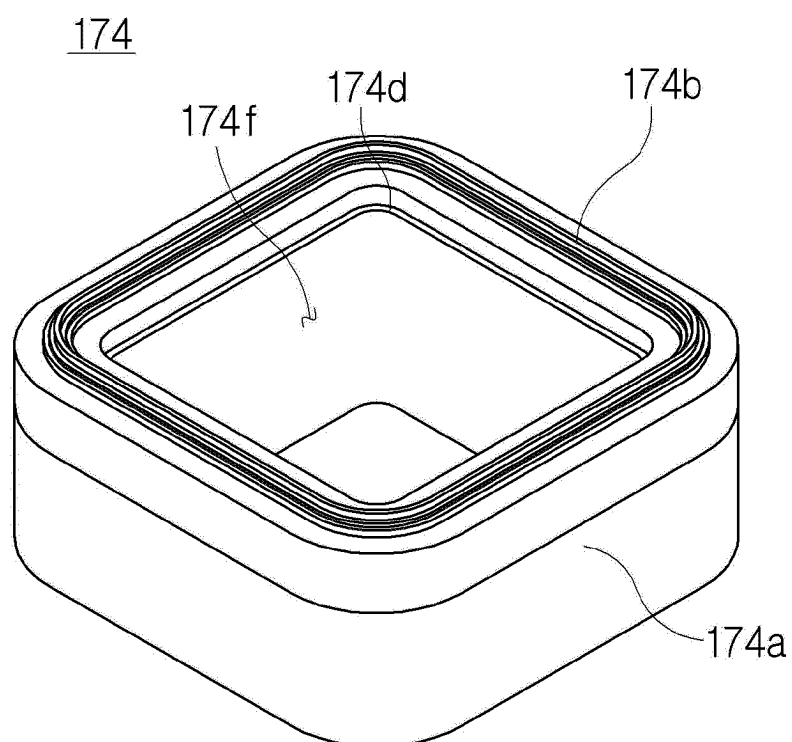
【FIG. 16】



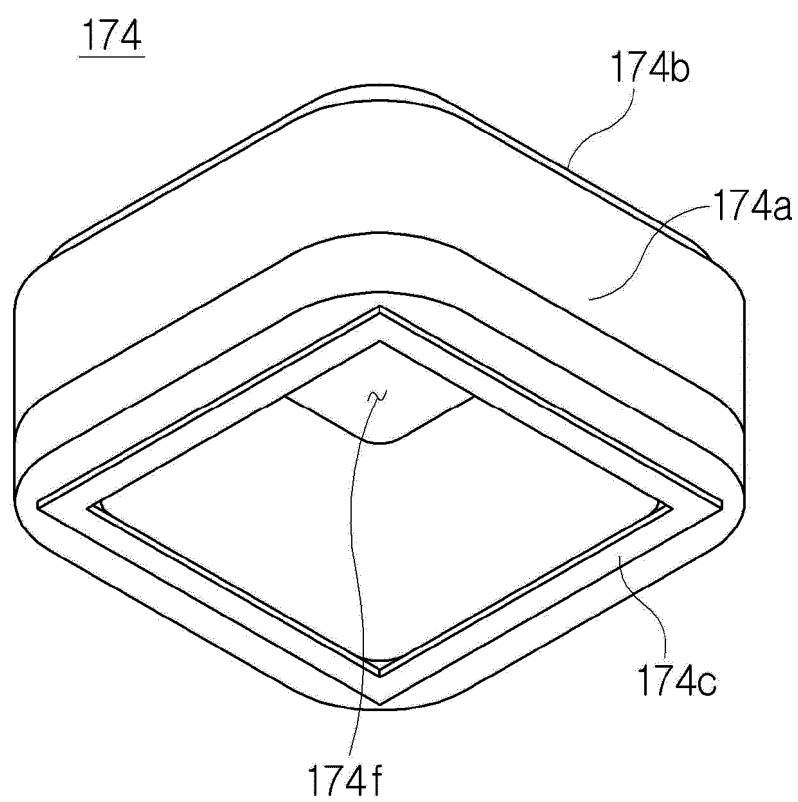
【FIG. 17】



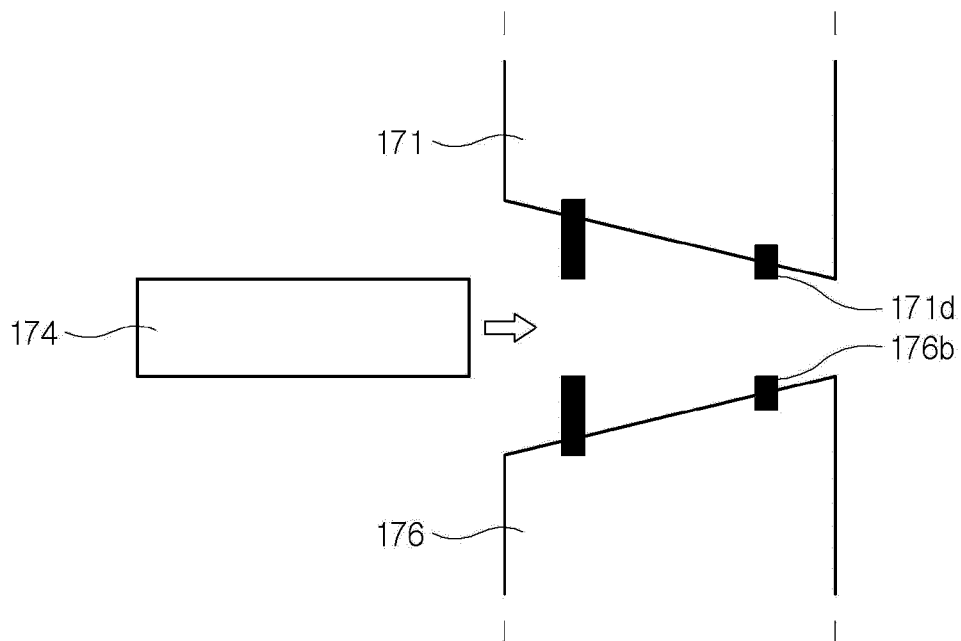
【FIG. 18】



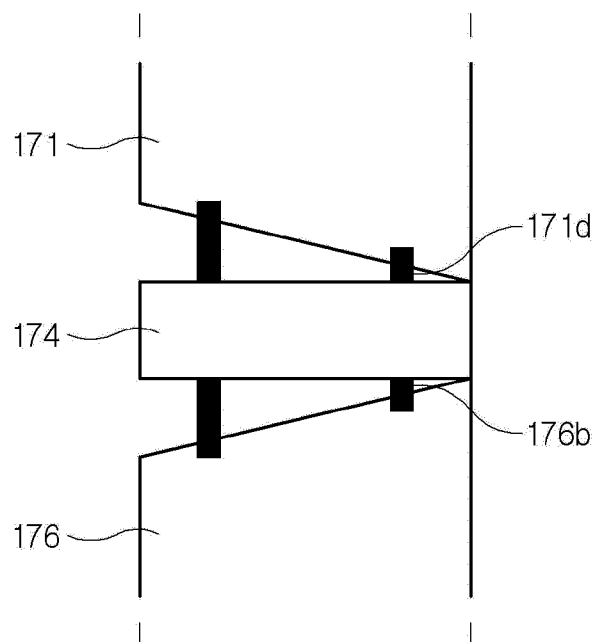
【FIG. 19】



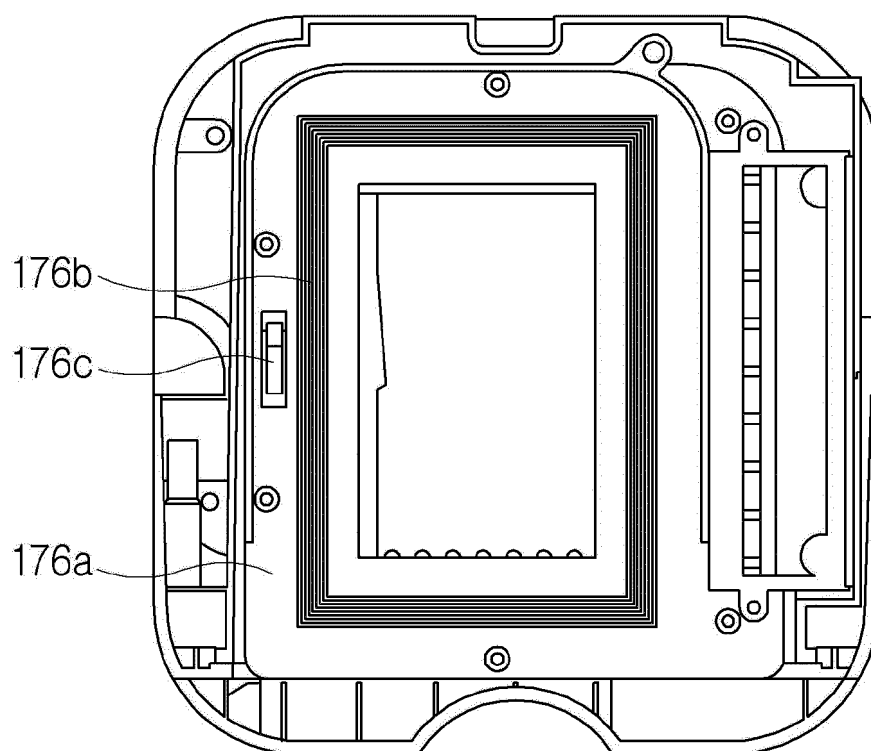
【FIG. 20】



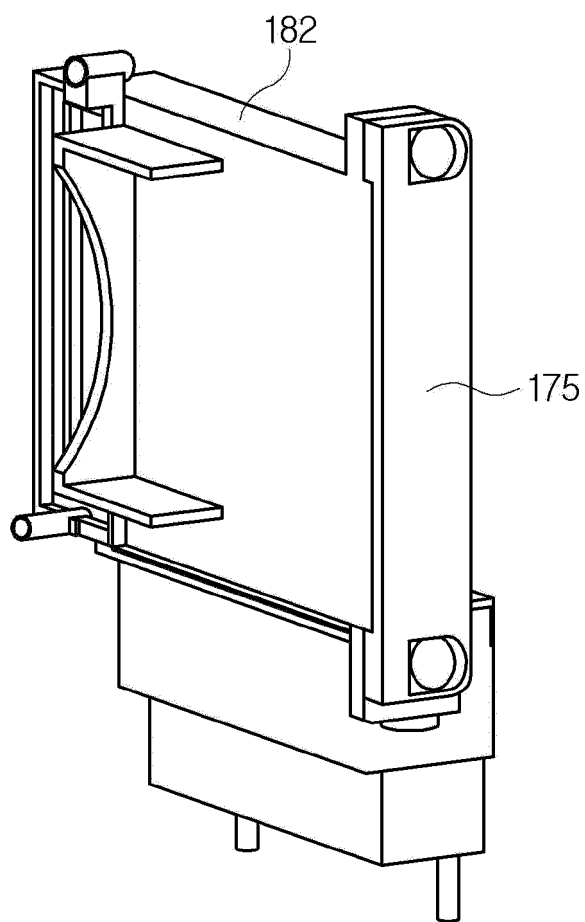
【FIG. 21】



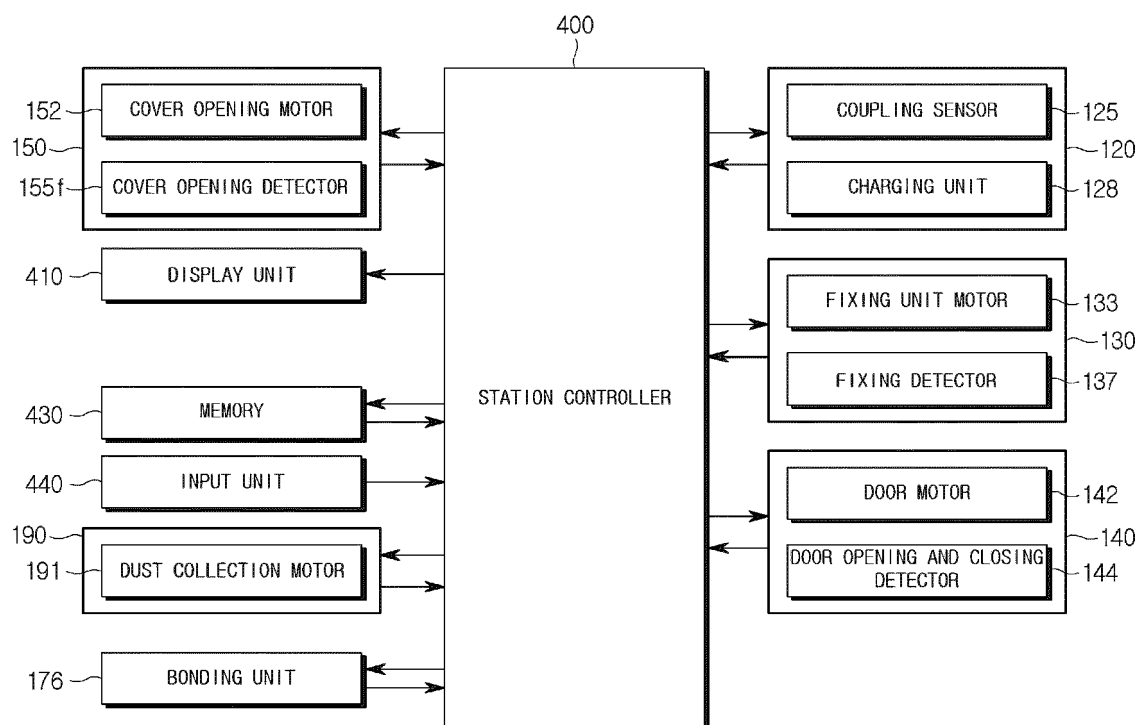
【FIG. 22】



【FIG. 23】



【FIG. 24】



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2023/005938

A. CLASSIFICATION OF SUBJECT MATTER

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

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47L 9/28(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), 실러(sealer), 경사(incline)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2022-0057764 A (LG ELECTRONICS INC.) 09 May 2022 (2022-05-09) See paragraphs [0077]-[0188] and [0208] and figures 1-14.	1-10
Y	JP 2015-520090 A (SANGENIC INTERNATIONAL LTD.) 16 July 2015 (2015-07-16) See paragraphs [0010], [0034] and [0147] and figures 1-23.	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	CN 214297618 U (ZHANG, Xudong) 28 September 2021 (2021-09-28) See paragraph [0043], claim 4 and figures 1-6.	1-10
DA	KR 10-2021-0019940 A (LG ELECTRONICS INC.) 23 February 2021 (2021-02-23) See paragraphs [0170] and [0389]-[0416] and figures 1-5.	1-10

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

* Special categories of cited documents:

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“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

23 August 2023

Date of mailing of the international search report

25 August 2023

Name and mailing address of the ISA/KR

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Facsimile No. +82-42-481-8578

Authorized officer

Telephone No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2023/005938

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