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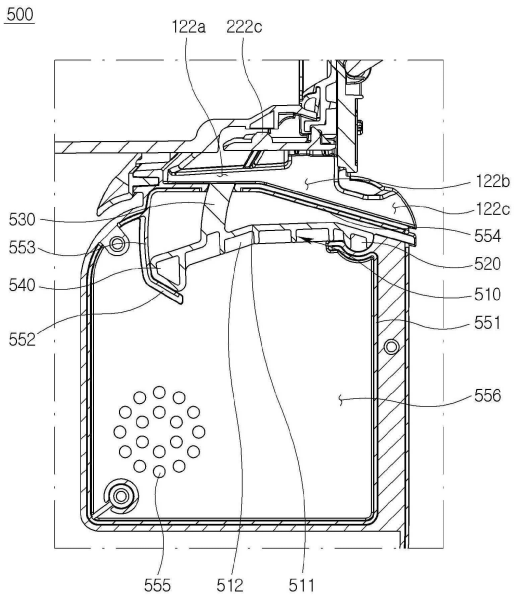
(54) CLEANER STATION

(57) The present invention relates to a cleaner station and may include a dustbin cover control unit for opening and closing a discharge cover of a cleaner dustbin, wherein the dustbin cover control unit has a cover control gear on which gear teeth and a cam unit are formed so that a cover control sensor detects a cam according to rotation of the cover control gear to precisely detect a rotational position of the cover control gear, thereby precisely controlling the discharging cover even without using an encoder or the like.

[FIG. 9]



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Description

[Technical Field]

[0001] The present invention relates to a cleaner station, and more specifically, to a cleaner station capable of automatically opening and closing a dustbin cover of a cleaner to collect dust in a dustbin when coupled to the cleaner.

[Background Art]

[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 dustbin inside a product and is commonly called a vacuum cleaner.

[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.

[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 dustbin and a cleaner body, are increasingly being used.

[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.

[0006] The hand vacuum cleaner is designed to maximize portability and has lightweight and a short length, and thus can have a limited cleaning region. Accordingly, the hand vacuum cleaner is used to clean localized sites, such as on a desk, a sofa, or a vehicle interior.

[0007] A user may use the stick-type vacuum cleaner while standing to enable cleaning without bending down. Accordingly, it is advantageous in 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.

[0008] However, since conventional handheld vacuum cleaners and the stick-type vacuum cleaners have a small capacity of dustbins that store collected dust, there is inconvenience that a user needs to empty the dustbin every time.

[0009] In addition, when the dustbin is emptied, there is a problem that dust flies and has a harmful effect on the user's health.

[0010] In addition, there is a problem of lowering a suction force of the cleaner when the residual dust in the dustbin is not removed.

[0011] In addition, there is a problem that odor caused by residues occurs when the residual dust in the dustbin is not removed.

[0012] As the patent document, Korean Laid-Open Patent No. 10-2020-0074001 discloses a docking station capable of emptying a dustbin of a vacuum cleaner coupled thereto.

[0013] The docking station is configured such that the dustbin is opened by a coupling force generated when a user presses the dustbin to the docking station.

[0014] Such a docking station has the inconvenience of requiring the user to separate the dustbin from the vacuum cleaner and then couple it to the docking station.

[0015] In addition, regardless of whether dust is collected in the dustbin, the dustbin of the vacuum cleaner has a limitation in that it remains open when coupled to the docking station. In this case, when the user separates the dustbin, there is a limitation in that residual dust in the opened dustbin may be scattered.

[0016] As Patent Document, Korean Laid-Open Patent No. 10-2021-0019940 discloses a cleaner station capable of automatically emptying a dustbin of a cleaner when coupled to the cleaner.

[0017] The patent document discloses a structure in which, when a cleaner is coupled to a cleaner station, a coupling lever is pressed to open a dustbin discharge cover of the cleaner.

[0018] However, in the cleaner station, a separate motor, gear, and sensor are provided to press the coupling lever, thereby increasing the number of components and power consumption required for operation.

[0019] In addition, since time is required to operate and control the motor, the total time required for dust collection increases.

[Disclosure]

[Technical Problem]

[0020] The present invention has been made in efforts to solve the above problems of a conventional cleaner station and cleaner system, and control method thereof and is directed to providing a cleaner station capable of removing dust in a dustbin without separate manipulation of a user, thereby providing user convenience.

[0021] The present invention is also directed to providing a cleaner station capable of automatically controlling a discharge cover of a dustbin to connect or block an internal space of the dustbin and a flow path of the cleaner station when coupled to a cleaner.

[0022] The present invention is also directed to providing a cleaner station capable of opening a discharge cover without using a motor for opening the discharge cover.

[0023] The present invention is also directed to providing a cleaner station capable of reducing the amount of

power consumed during operation of a motor.

[0024] The present invention is also directed to providing a cleaner station capable of simplifying a process from when a cleaner is coupled to when a dust collection motor operates, thereby reducing the total dust collection time.

[Technical Solution]

[0025] According to the present invention, there is provided a cleaner station including a housing, a coupling unit disposed in the housing and coupled to at least a portion of a dustbin of a cleaner, a cover opening unit configured to open a discharge cover of the dustbin when the dustbin is coupled to the coupling unit, a dust collection unit which is accommodated inside the housing, disposed below the coupling unit, and collects dust from the dustbin, and a dust collection motor which is accommodated inside the housing, disposed below the dust collection unit, and generates a suction force of sucking the dust from the dustbin.

[0026] In this case, the dustbin includes a dustbin main body in which dust is stored and an internal space is opened and closed by the discharge cover, and a coupling lever which is provided on the dustbin main body and releases coupling between the discharge cover and the dustbin main body when an external force is applied.

[0027] In this case, the cover opening unit may be moved by the suction force generated by the dust collection motor to press the coupling lever.

[0028] In this case, the cover opening unit may include a pressure moving member moved by the suction force of the dust collection motor, and a cover opening member formed to protrude and extend from the pressure moving member toward the coupling lever.

[0029] In this case, the pressure moving member may be hinge-coupled to the housing and rotated toward the coupling lever when the suction force of the dust collection motor is applied.

[0030] Alternatively, the pressure moving member may move linearly toward the coupling lever when the suction force of the dust collection motor is applied.

[0031] In this case, the cover opening member may be formed to protrude from the pressure moving member and formed to be inclined at a predetermined angle with respect to an extension direction of the pressure moving member.

[0032] Meanwhile, the cover opening unit may further include an air duct in which the pressure moving member is movably accommodated and a flow path through which air flows when the dust collection motor is operated is formed.

[0033] In this case, the air duct may include a duct main body including a movement space for the pressure moving member, a stopper which is formed to protrude from an inner surface of the duct main body and restricts downward movement of the pressure moving member, and a flow guide unit which is formed to protrude from the inner surface of the duct main body and guides a flow path of the air.

[0034] Meanwhile, the cleaner station according to the present invention may further include a fixing unit configured to fix the dustbin when the dustbin is coupled to the coupling unit.

[0035] In this case, the fixing unit may include a fixing member configured to move toward the dustbin main body when an external force is applied to press the dustbin main body.

[0036] In this case, when the dust collection motor is operated, the fixing member may fix the dustbin main body by the suction force of the dust collection motor, and the cover opening unit may press the coupling lever.

[0037] Meanwhile, a cleaner system including a cleaner and a cleaner station according to the present invention includes a suction flow path through which air is introduced into the cleaner, a flow path unit configured to guide dust in the dustbin to the dust collection motor, a bypass flow path configured to allow the flow path unit to communicate with a cover opening hole formed in a dustbin guide surface, and a cover opening flow path through which air flows to move the cover opening member.

[0038] In this case, the flow path unit and the bypass flow path may be formed to intersect each other, and the bypass flow path and the cover opening flow path may be formed to intersect each other.

[0039] In addition, the suction flow path and the bypass flow path may be formed to intersect each other.

[0040] In addition, a longitudinal direction of an internal space of the dustbin may be formed to intersect at least one of the flow path unit, the suction flow path, and the cover opening flow path.

[0041] In this case, when the dust collection motor is operated, the direction of air flowing through the suction flow path or the cover opening flow path may be opposite to the direction of air flowing through the flow path unit.

[Advantageous Effects]

[0042] As described above, according to the cleaner station, cleaner system, and control method thereof according to the present invention, it is possible to eliminate the inconvenience of the user having to empty the dustbin every time.

[0043] In addition, when the cleaner is coupled, the cover control frame can be rotated to control the discharge cover, thereby allowing or blocking communication between the internal space of the dustbin and the flow path of the cleaner station.

[0044] In addition, by pressing the coupling lever of the dustbin by the suction force generated from the dust collection motor, the dustbin can be opened, thereby omitting the motor, gear, and sensor for opening the discharge cover.

[0045] In addition, power consumption required for operating the motor and the sensor during opening of

the discharge cover can be reduced.

[0046] In addition, by providing a cleaner station capable of simplifying the process from when the cleaner is coupled to when the dust collection motor operates, the total dust collection time can be reduced.

[Description of Drawings]

[0047]

FIG. 1 is a perspective view of a cleaner system composed of a cleaner station and a cleaner according to an embodiment of the present invention.

FIGS. 2 and 3 are views for describing the cleaner of the cleaner system according to the embodiment of the present invention.

FIG. 4 is a view for describing a lower surface of a dustbin of the cleaner according to the embodiment of the present invention.

FIG. 5 is a schematic view illustrating a configuration of the cleaner system according to the embodiment of the present invention.

FIG. 6 is a view for describing a coupling unit of the cleaner station according to the embodiment of the present invention.

FIG. 7 is an exploded perspective view for describing a fixing unit of the cleaner station according to the embodiment of the present invention.

FIG. 8 is a view for describing a cover control unit of the cleaner station according to the embodiment of the present invention.

FIGS. 9 to 12 are views for describing a cover opening unit of the cleaner station according to one embodiment of the present invention.

FIG. 13 is a view for describing another embodiment of a cover opening member of the present invention.

FIGS. 14 and 15 are views for describing the operation of a cover opening unit of the cleaner station according to one embodiment of the present invention.

FIGS. 16 and 17 are views for describing a cover opening unit of a cleaner station according to another embodiment of the present invention.

FIG. 18 is a block diagram for describing a control configuration of the cleaner station according to the embodiment of the present invention.

FIG. 19 is a flowchart for describing a control method of the cleaner station according to an embodiment of the present invention.

[Mode for Invention]

[0048] Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[0049] Since the present invention may have various changes and various embodiments, specific embodiments are illustrated in the accompanying drawings and specifically described in the detailed 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.

[0050] The terms used in the present application are only used to describe specific embodiments and are not intended to limit the present invention. A singular expression includes a plural expression unless the context clearly dictates otherwise.

[0051] 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.

[0052] FIG. 1 is a perspective view of a cleaner system composed of a cleaner station and a cleaner according to an embodiment of the present invention, and FIG. 5 is a schematic view of a configuration of the cleaner system according to the embodiment of the present invention.

[0053] Referring to FIGS. 1 and 5, a cleaner system 10 according to the embodiment of the present invention may include a cleaner station 100 and a cleaner 200.

[0054] The cleaner system 10 may include the cleaner station 100. The cleaner 200 may be coupled to the cleaner station 100. Specifically, a main body of the cleaner 200 may be coupled to a side surface of the cleaner station 100. The cleaner station 100 may remove dust of a dustbin 220 of the cleaner 200.

[0055] Meanwhile, FIGS. 2 and 3 are views for describing the cleaner of the cleaner system according to the embodiment of the present invention, and FIG. 4 is a view for describing a lower surface of a dustbin of the cleaner according to the embodiment of the present invention.

[0056] First, a structure of the cleaner 200 will be described with reference to FIGS. 1 to 5.

[0057] The cleaner 200 may be a cleaner which is manually operated by a user. For example, the cleaner 200 may be a hand cleaner or a stick cleaner.

[0058] 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.

[0059] 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 dustbin 220 and a battery housing 230 are placed on the floor.

[0060] In this case, the term "front" may be a direction in which a suction unit 212 is disposed with respect to a suction motor 214, and the term "rear" may be a direction in which a handle 216 is disposed with respect to the suction motor 214. In addition, a direction disposed at the

right side may be referred to as a right side, and a direction disposed at the left side may be referred to as a left side based on 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 floor based on when the bottom surfaces (lower surfaces) of the dustbin 220 and the battery housing 230 are placed on the floor.

[0061] 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, the suction motor 214, an air discharge cover 215, the handle 216, and an operation unit 218.

[0062] The main body housing 211 may form an exterior of the cleaner 200. The main body housing 211 may provide a space in which the suction motor 214 and a filter (not illustrated) may be accommodated. The main body housing 211 may be formed in a shape similar to a cylinder.

[0063] The suction unit 212 may protrude outward from the main body housing 211. For 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 through which dust-containing air may flow (hereinafter referred to as a "suction flow path").

[0064] Meanwhile, in the present embodiment, a virtual line passing through the suction unit 212 configured in a cylindrical shape may be formed.

[0065] 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 dustbin 220.

[0066] 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. Accordingly, the air and dust suctioned through the suction unit 212 spirally flow along an inner circumferential surface of the dust separator 213. Accordingly, the cyclonic flow may occur in the internal space of the dust separator 213.

[0067] The dust separator 213 communicates with the suction unit 212 and employs the principle of a dust collector using a centrifugal force to separate dust suctioned into the main body 210 through the suction unit 212.

[0068] The dust separator 213 may further include a secondary cyclone which reseparates dust from the air discharged from the cyclone. In this case, the secondary cyclone may be positioned inside the cyclone to minimize a size of the dust separator. The secondary cyclone may include a plurality of cyclone bodies disposed parallel to each other. The air discharged from the cyclone may be divided and may pass through the plurality of cyclone bodies.

[0069] In this case, an axis of the cyclonic flow of the secondary cyclone may also 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, which may be collectively referred to as an axis of the cyclonic flow of the dust separator 213.

[0070] The suction motor 214 may generate a suction force for sucking air. The suction motor 214 may be accommodated in the main body housing 211. The suction motor 214 may generate a suction force through its rotation. For example, the suction motor 214 may be provided in a shape similar to a cylindrical shape.

[0071] Meanwhile, in the present embodiment, a virtual suction motor axial line extending a rotational axis of the suction motor 214 may be formed.

[0072] The air discharge cover 215 may be disposed on one axial side of the main body housing 211. The air discharge cover 215 may accommodate a filter for filtering air. For example, the air discharge cover 215 may accommodate a HEPA filter.

[0073] An air outlet through which the air sucked by the suction force of the suction motor 214 is discharged may be formed on the air discharge cover 215.

[0074] 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.

[0075] The handle 216 may be gripped by a user. The handle 216 may be disposed behind the suction motor 214. For example, the handle 216 may be formed in a shape similar to a cylindrical shape. Alternatively, the handle 216 may be formed in a curved cylindrical shape. The handle 216 may be disposed at a predetermined angle with the main body housing 211, the suction motor 214, or the dust separator 213.

[0076] The handle 216 may include a grip portion formed in a pillar shape to allow the user to grip it, a first extension connected to one end portion in a longitudinal direction (axial direction) of the grip portion and formed to extend toward the suction motor 214, and a second extension connected to the other end portion in the direction (axial direction) of the grip portion and formed to extend toward the dustbin 220.

[0077] Meanwhile, in the present embodiment, a virtual grip portion through line formed to extend in the longitudinal direction of the grip portion (axial direction of a pillar) and passing through the grip portion may be formed.

[0078] For example, the grip portion through 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.

[0079] An upper surface of the handle 216 may form a partial exterior of an upper surface of the cleaner 200. Accordingly, when the user grips the handle 216, one component of the cleaner 200 can be prevented from being in contact with a user's arm.

[0080] The first extension may extend from the grip portion 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.

[0081] The second extension may extend from the grip portion toward the dustbin 220. At least a portion of the second extension may extend in the horizontal direction.

[0082] The operation unit 218 may be disposed on the handle 216. The operation unit 218 may be disposed on an inclined surface formed in an upper region of the handle 216. The user may input an operation or stop command of the cleaner 200 through the operation unit 218.

[0083] The cleaner 200 may include the dustbin 220. The dustbin 220 may communicate with the dust separator 213. The dustbin 220 may store the dust separated by the dust separator 213.

[0084] The dustbin 220 may include a dustbin main body 221, a discharge cover 222, a dustbin compression lever 223, and a compression member (not illustrated).

[0085] The dustbin main body 221 may provide a space in which the dust separated by the dust separator 213 may be stored. For example, the dustbin main body 221 may be formed in a shape similar to a cylindrical shape.

[0086] Meanwhile, in the present specification, a virtual dustbin through line, which passes through an interior (internal space) of the dustbin main body 221 and formed to extend in the longitudinal direction (axial direction in the cylindrical dustbin main body 221) of the dustbin main body 221, may be formed.

[0087] An extension of the longitudinal axis of the dustbin 220 may be formed in a direction intersecting the suction flow path.

[0088] A portion of a lower surface (bottom surface) of the dustbin main body 221 may be opened. In addition, a lower surface extension 221a may be formed on the lower surface (bottom surface) of the dustbin main body 221. The lower surface extension 221a may be formed to block a portion of the lower surface of the dustbin main body 221.

[0089] The dustbin 220 may include the discharge cover 222. The discharge cover 222 may be disposed on the lower surface of the dustbin 220.

[0090] The discharge cover 222 may be provided to open and close one end portion of the dustbin main body 221 in the longitudinal direction. Specifically, the discharge cover 222 may selectively open and close a lower portion of the dustbin 220 that is open downward.

[0091] 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 lower surface of the dustbin main body 221. The cover main body 222a may rotate downward from 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. Accordingly, when the discharge cover 222 is separated from the dustbin 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 dustbin main body 221 by an elastic force of the torsion spring 222d.

[0092] The discharge cover 222 may be coupled to the dustbin 220 through hook coupling. Meanwhile, the discharge cover 222 may be separated from the dustbin 220 by a coupling lever 222c. The coupling lever 222c may be disposed at the front of the dustbin. Specifically, the coupling lever 222c may be disposed on a front outer surface of the dustbin 220. When an external force is applied, the coupling lever 222c may elastically deform a hook formed to extend from the cover main body 222a to release hook coupling between the cover main body 222a and the dustbin main body 221.

[0093] When the discharge cover 222 is closed, the lower surface of the dustbin 220 may be blocked (sealed) by the discharge cover 222 and the lower surface extension 221a.

[0094] The dustbin 220 may include the dustbin compression lever 223 (see FIG. 3). The dustbin compression lever 223 may be disposed outside the dustbin 220 or the dust separator 213. The dustbin compression lever 223 may be disposed to move upward and downward outside the dustbin 220 or the dust separator 213. The dustbin compression lever 223 may be connected to a compression member (not illustrated). When the dustbin compression lever 223 is moved downward by an external force, the compression member (not illustrated) may also move downward. Accordingly, user convenience can be provided. The compression member (not illustrated) and the dustbin compression lever 223 may be returned to their original positions by an elastic member (not illustrated).

[0095] The compression member (not illustrated) may be disposed inside the dustbin main body 221. The compression member may move in the space inside the dustbin main body 221. Specifically, the compression member may move upward and downward in the dustbin main body 221. Accordingly, the compression member may compress the dust within the dustbin main body 221 downward. In addition, when the discharge cover 222 is separated from the dustbin main body 221 and the lower portion of the dustbin 220 is opened, the compression member may move from the top to bottom of the dustbin 220 to remove foreign substances such as the residual dust and the like within the dustbin 220. Accordingly, the suction force of the cleaner can be improved by preventing the residual dust from remaining in the dustbin 220. In addition, bad odors generated by the residue can be removed by preventing the residual dust from remaining in the dustbin 220.

[0096] The cleaner 200 may include the battery housing 230. A battery 240 may be accommodated in the battery housing 230. The battery housing 230 may be disposed below the handle 216.

[0097] The battery housing 230 may include an accommodation portion which is opened downward. The battery 240 may be detachably attached through the accommodation portion of the battery housing 230.

[0098] The cleaner 200 may include the battery 240.

[0099] 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. For example, the battery 240 may be inserted into the battery housing 230 from the bottom of the battery housing 230.

[0100] Alternatively, the battery 240 may be integrally provided inside the battery housing 230. In this case, a lower surface of the battery 240 is not exposed to the outside.

[0101] The battery 240 may supply power to the suction motor 214 of the cleaner 200. The battery 240 may be disposed below the handle 216. The battery 240 may be disposed behind the dustbin 220.

[0102] According to the embodiment, when the battery 240 is coupled to the battery housing 230, the lower surface of the battery 240 may be exposed to the outside. Since the battery 240 may be placed on the floor when the cleaner 200 is disposed 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 exposed to the outside and is in direct contact with external air of the battery 240, cooling performance of the battery 240 can be improved.

[0103] Meanwhile, when the battery 240 is integrally fixed to the battery housing 230, a structure for detachably attaching the battery 240 to the battery housing 230 can be smaller, thereby reducing the overall size of the cleaner 200 and achieving lightweight.

[0104] 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 212 of the main body 210. The extension pipe 250 may be formed in a cylindrical shape.

[0105] 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 a 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.

[0106] The cleaner 200 may include the cleaning module 260. The cleaning module 260 may communicate with the extension pipe 250. Accordingly, external air may flow into the main body 210 of the cleaner 200 through the cleaning module 260 and the extension pipe 250 by the suction force generated from the main body 210 of the cleaner 200.

[0107] Dust within the dustbin 220 of the cleaner 200 may be collected in a dust collection unit 170 of the cleaner station 100 by gravity and the suction force of a dust collection motor 191. Accordingly, since the dust within the dustbin may be removed without the user's separate operation, user convenience can be provided. In addition, it is possible to eliminate the inconvenience of the user having to empty the dustbin every time. In addition, when the dustbin is emptied, scattering of dust can be prevented.

[0108] 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 dustbin 220 and the battery housing 230 of the cleaner 200 may be disposed to face a coupling surface 121, an outer circumferential surface of the dustbin main body 221 may be coupled to a dustbin 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 center axis of the dustbin 220 may be disposed in a direction parallel to the floor, and the extension pipe 250 may be disposed in a direction perpendicular to the floor.

[0109] The cleaner station 100 of the present invention will be described with reference to FIGS. 1 and 5 as follows.

[0110] The cleaner 200 may be disposed in the cleaner station 100. The cleaner 200 may be coupled to the side surface of 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 dustbin 220 of the cleaner 200.

[0111] The cleaner station 100 may include a housing 110. The housing 110 may form the exterior of the cleaner station 100. Specifically, the housing 110 may be formed in a pillar shape including at least one outer wall surface. For example, the housing 110 may be formed in a shape similar to a quadrangular pillar.

[0112] The housing 110 may have a space in which the dust collection unit 170 for storing dust therein and a dust suction module 190 for generating a flow force for collecting dust into the dust collection unit 170 may be accommodated.

[0113] The housing 110 may include a bottom surface 111, an outer wall surface 112, and an upper surface 113.

[0114] The bottom surface 111 may support a lower side of the dust suction module 190 in a gravity direction. That is, the bottom surface 111 may support the lower side of the dust collection motor 191 of the dust suction module 190.

[0115] In this case, the bottom surface 111 may be disposed toward the floor. The bottom surface 111 may be disposed parallel to the floor and inclined at a predetermined angle with respect to the floor. With this configuration, the dust collection motor 191 can be stably supported, and the overall weight can be balanced even when the cleaner 200 is coupled.

[0116] Meanwhile, according to the embodiment, the bottom surface 111 may further include a floor support for increasing an area in contact with the floor to prevent the cleaner station 100 from falling and maintain its balance. For example, the floor support may be formed in a plate shape extending from the bottom surface 111, and one or

more frames may be formed to protrude and extend from the bottom surface 111 toward the floor.

[0117] The outer wall surface 112 may be formed in a gravity direction and may also be connected to the bottom surface 111. For example, the outer wall surface 112 may be connected perpendicular to the bottom surface 111. In another embodiment, the outer wall surface 112 may be inclined at a predetermined angle with respect to the bottom surface 111.

[0118] The outer wall surface 112 may include at least one surface. For example, the outer wall surface 112 may include a first outer wall surface 112a, a second outer wall surface 112b, a third outer wall surface 112c, and a fourth outer wall surface 112d.

[0119] 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 refer to a surface on which the cleaner 200 is exposed while coupled to the cleaner station 100. Accordingly, the first outer wall surface 112a may form an exterior of the front surface of the cleaner station 100.

[0120] 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.

[0121] When the cleaner 200 is caught on the cleaner station 100, a direction in which the cleaner 200 is exposed to the outside of the cleaner station 100 may be referred to as "front."

[0122] 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 "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 "rear."

[0123] 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 a "rear surface" of the cleaner station 100. Accordingly, the rear surface may refer to a direction in which the second outer wall surface 112b is formed.

[0124] In addition, when viewing the front surface with respect to the internal space of the housing 110, a surface of the left side may be referred to as a "left surface," and a surface of the right side may be referred to as a "right surface." Accordingly, 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.

[0125] The first outer wall surface 112a may be formed in a flat surface shape and entirely in a curved shape, and a portion thereof may have a curved surface.

[0126] The first outer wall surface 112a may have an exterior corresponding to the shape of the cleaner 200. Specifically, 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 specific configuration of the coupling unit 120 will be described below.

[0127] Meanwhile, a structure in which various types of cleaning modules 260 used in the cleaner 200 are caught may be added to the first outer wall surface 112a.

[0128] In the present embodiment, the second outer wall surface 112b may face 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. Here, the rear surface may face the surface to which the cleaner 200 or a second cleaner 300 is coupled. Accordingly, the second outer wall surface 112b may form an exterior of the rear surface of the cleaner station 100.

[0129] In the present embodiment, the third outer wall surface 112c and the fourth outer wall surface 112d may connect the first outer wall surface 112a to 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.

[0130] The third outer wall surface 112c or the fourth outer wall surface 112d may be formed in a flat surface shape and entirely in a curved shape, and a portion thereof may have a curved surface.

[0131] Meanwhile, a structure in which various types of cleaning modules 260 used in the cleaner 200 are caught may be added to the third outer wall surface 112c or the fourth outer wall surface 112d.

[0132] The upper surface 113 may form an exterior of the upper side of the cleaner station. That is, the upper surface 113 may be a surface that is disposed on an uppermost side of the cleaner station in a gravity direction and exposed to the outside in the cleaner station.

[0133] For reference, in the present embodiment, an upper side and a lower side may refer to directions in a gravity direction (direction perpendicular to the floor) in a state in which the cleaner station 100 is installed on the floor.

[0134] In this case, the upper surface 113 may be disposed parallel to the floor and inclined at a predetermined angle with respect to the floor.

[0135] A display unit 410 may be disposed on the upper surface 113. For example, the display unit 410 may display the state of the cleaner station 100 and the state of the cleaner 200 and also display information such as a cleaning progress, a map of a cleaning zone, etc.

[0136] Meanwhile, according to the embodiment, the upper surface 113 may be provided to be separated 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 an internal space surrounded by the outer wall surface 112 and provided

with a terminal (not illustrated) for charging the separated battery.

[0137] FIG. 6 is a view for describing the coupling unit of the cleaner station according to the embodiment of the present invention.

[0138] The coupling unit 120 of the cleaner station 100 of the present invention will be described with reference to FIGS. 5 and 6 as follows.

[0139] 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 dustbin 220, and the battery housing 230 of the cleaner 200 may be coupled.

[0140] 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. For example, the coupling surface 121 may be formed in a groove shape that is concavely formed from the first outer wall surface 112a toward the interior of the cleaner station 100. That is, the coupling surface 121 may be formed by forming a step with the first outer wall surface 112a.

[0141] The cleaner 200 may be accommodated in the coupling surface 121. For example, the coupling surface 121 may face the lower surfaces of the dustbin 220 and the battery housing 230 of the cleaner 200. Here, the lower surface may face the floor when the user uses the cleaner 200 or places the cleaner 200 on the floor.

[0142] For example, an angle formed by the coupling surface 121 and the floor may be a right angle. Accordingly, when the cleaner 200 is coupled to the coupling surface 121, the space of the cleaner station 100 can be minimized.

[0143] As another example, the coupling surface 121 may be inclined at a predetermined angle with respect to the floor. Accordingly, when the cleaner 200 is coupled to the coupling surface 121, the cleaner station 100 can be stably supported.

[0144] A dust through-hole 121a may be formed in the coupling surface 121 so that external air may flow into the housing 110. The dust through-hole 121a may be formed in a hole shape to correspond to the shape of the dustbin 220 so that the dust of the dustbin 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 dustbin 220. The dust through-hole 121a may be formed to communicate with a flow path unit 180 to be described below.

[0145] The coupling unit 120 may include the dustbin guide surface 122. The dustbin guide surface 122 may be disposed on the first outer wall surface 112a. The dustbin guide surface 122 may be connected to the first outer wall surface 112a. In addition, the dustbin guide surface 122 may be connected to the coupling surface 121.

[0146] The dustbin guide surface 122 may be formed in a shape corresponding to the outer surface of the dustbin 220. The front outer surface of the dustbin 220 may be coupled to the dustbin guide surface 122.

[0147] Meanwhile, a cover opening hole 122a may be formed in the dustbin guide surface 122, and a cover opening member 530 to be described below may pass through the cover opening hole 122a to press the coupling lever 222c. In addition, a cover opening unit 500 may be provided on a lower side of the dustbin guide surface 122 in a gravity direction. In this case, a bypass flow path 122b may be formed between a lower surface of the dustbin guide surface 122 and an upper surface of an air duct 550.

[0148] That is, the bypass flow path 122b may be formed between the outer surface of the dustbin 220 and the upper surface of the air duct 550. Specifically, the bypass flow path 122b may be formed between the outer surface of the dustbin 220 and an upper support surface 554 of the air duct 550, based on the state in which the dustbin 220 is coupled to the dustbin guide surface 122.

[0149] In addition, the bypass flow path 122b may be connected to a first flow path 181 through a bypass hole 122c. That is, the cover opening hole 122a, the bypass hole 122c, and the first flow path 181 may communicate with each other through the bypass flow path 122b (see FIG. 9). In this case, the bypass flow path may be formed in a direction intersecting the formation direction of the suction flow path.

[0150] With this configuration, when the dust collection motor 191 is operated in a state in which the dustbin 220 is coupled to the coupling unit 120, dust and the like that remain on the dustbin 220 and the dustbin guide surface 122 may be sucked through the bypass flow path.

[0151] In addition, in the present invention, when the dust collection motor 191 is operated while the dustbin 220 is coupled to the coupling unit 120, the suction force of the dust collection motor 191 may be transmitted through the bypass flow path, thereby moving a pressure moving member 510 to be described below.

[0152] 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 from the coupling surface 121 toward the front of the cleaner station 100. 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. Accordingly, the convenience of coupling the cleaner 200 to the coupling surface 121 can be provided.

[0153] The coupling unit 120 may include sidewalls 124. The sidewalls 124 may be disposed on both side surfaces of the coupling surface 121 and may be vertically connected to the coupling surface 121. The sidewall 124 may be connected to the first outer wall surface 112a. In addition, the sidewall 124 may form a surface connected to the dustbin guide surface 122. Accordingly, the cleaner 200 can be stably accommodated.

[0154] 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.

[0155] The coupling sensor 125 may include a contact sensor. For example, the coupling sensor 125 may include a micro switch. In this case, the coupling sensor 125 may be disposed on the guide protrusion 123. Accordingly, 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 be in contact with the coupling sensor 125, and the coupling sensor 125 may detect that the cleaner 200 has been coupled.

[0156] Meanwhile, the coupling sensor 125 may include a non-contact sensor. For example, the coupling sensor 125 may include an infrared (IR) sensor. In this case, the coupling sensor 125 may be disposed on the sidewall 124. Accordingly, when the dustbin 220 or the main body 210 of the cleaner 200 reaches the coupling surface 121 through the sidewall 124, the coupling sensor 125 may detect the presence of the dustbin 220 or the main body 210.

[0157] The coupling sensor 125 may face the dustbin 220 or the battery housing 230 of the cleaner 200.

[0158] The coupling sensor 125 may be a member for determining whether power is applied to the battery 240 of the cleaner 200 and whether the cleaner 200 has been coupled.

[0159] 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 dustbin 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 to correspond to the shape of the suction unit 212.

[0160] The coupling unit 120 may further include a fixing member entrance hole 127. The fixing member entrance hole 127 may be formed as an elongated hole along the sidewall 124 to allow the insertion and removal of a fixing member 131.

[0161] 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 can be stably disposed on the coupling unit 120 by the dustbin guide surface 122, the guide protrusion 123, and the suction unit guide surface 126. Accordingly, the convenience of coupling the dustbin 220 and the battery housing 230 of the cleaner 200 to the coupling surface 121 can be provided.

[0162] A fixing unit 130 according to the present invention will be described with reference to FIGS. 5, 7, and 18 as follows.

[0163] The cleaner station 100 according to the present invention may include the fixing unit 130. The fixing unit 130 may be disposed on the sidewall 124. The fixing unit 130 may fix the cleaner 200 coupled to the dustbin guide surface 122. Specifically, the fixing unit 130 may fix the dustbin 220 of the cleaner 200 coupled to the dustbin guide surface 122.

[0164] The fixing unit 130 may include a fixing member 131 for fixing the dustbin 220 and the battery housing 230 of the cleaner 200.

[0165] The fixing member 131 may be disposed on the sidewall 124 of the coupling unit 120 and provided to reciprocate along the sidewall 124 to fix the dustbin 220. Specifically, the fixing member 131 may be accommodated inside the fixing member entrance hole 127.

[0166] The fixing member 131 may be disposed on each of both sides of the coupling unit 120. For example, a pair of two fixing members 131 may be disposed symmetrically with respect to the coupling surface 121.

[0167] When an external force is applied, the fixing member 131 may be moved toward the dustbin 220 to fix the dustbin. In addition, when the external force is released, the fixing member 131 that has fixed the dustbin 220 may be moved away from the dustbin 220.

[0168] For example, the fixing member 131 may be moved by power of a motor. That is, the fixing member 131 may be moved by receiving power through at least one motor and a link connected to the motor.

[0169] As another example, the fixing member 131 may be moved by the suction force of the dust collection motor 191. That is, the fixing member 131 may be moved by receiving the suction force through a flow path such as a hose or the like.

[0170] Meanwhile, the fixing unit 130 may further include a fixing sealer 136. When coupled to the cleaner 200, the fixing sealer 136 may be disposed on the dustbin guide surface 122 to airtighten the dustbin 220. With this configuration, when the dustbin 220 of the cleaner 200 is coupled, the fixing sealer 136 may be pressed by the weight of the cleaner 200, and the dustbin 220 and the dustbin guide surface 122 may be sealed.

[0171] Accordingly, the suction force of the cleaner can be improved by preventing the residual dust from remaining in the dustbin. In addition, bad odors generated by the residue can be removed by preventing the residual dust from remaining in the dustbin.

[0172] The dustbin cover control unit 140 of the present invention will be described with reference to FIGS. 5 and 8 as follows.

[0173] The cleaner station 100 of the present invention may include the dustbin cover control unit 140. The dustbin cover control unit 140 may be configured to open and close the dust through-hole 121a.

[0174] The dustbin cover control unit 140 may include a cover control frame 141, a cover control motor 142, and a link 143.

[0175] The cover control frame 141 is hinge-coupled to the housing 110 to open and close the dust through-hole 121a. The cover control frame 141 may include a frame main body 141a.

[0176] The frame main body 141a may be formed in a shape that may block the dust through-hole 121a. For example, the frame main body 141a may be formed in a shape similar to a disk shape. As another example, the frame main body 141a may be formed in a quadrangular plate shape.

[0177] Based on a state in which the frame main body 141a blocks the dust through-hole 121a, a hinge unit 141b may be disposed above the frame main body 141a, and a link coupling unit 141c may be disposed below the frame main body 141a.

[0178] The hinge unit 141b may be disposed on an upper end portion of the frame main body 141a and hinge-coupled to the housing 110.

[0179] The link coupling unit 141c may be disposed below the frame main body 141a and rotatably coupled to the link 143.

[0180] With this configuration, in a state in which the cover control frame 141 blocks at least a portion of the dust through-hole 121a, when the link 143 pulls the frame main body 141a, the frame main body 141a may rotate about the hinge unit 141b toward an interior of the cleaner station 100, and the dust through-hole 121a may be opened. Meanwhile, in a state in which the dust through-hole 121a is open, when the link 143 pushes the frame main body 141a, the frame main body 141a rotates about the hinge unit 141b toward the outside of the cleaner station 100, and at least a portion of the dust through-hole 121a may be blocked.

[0181] Meanwhile, in a state in which the cleaner 200 is coupled to the cleaner station 100 and the discharge cover 222 is separated from the dustbin main body 221, the cover control frame 141 may be in contact with the discharge cover 222. In addition, according to the rotation of the cover control frame 141, the discharge cover 222 may be rotated in conjunction with the cover control frame 141.

[0182] The cover control motor 142 may provide power to rotate the cover control frame 141. Specifically, the cover control motor 142 may rotate the link 143 in a forward or reverse direction.

[0183] Here, the forward direction may be a direction in which the link 143 pulls the cover control frame 141. Accordingly, when the link 143 rotates in the forward direction, the discharge cover 222 may be opened. In addition, when the link 143 rotates in the forward direction, the internal space of the dustbin 220 and the flow path unit 180 may communicate with each other.

[0184] In addition, the reverse direction may refer to a direction in which the link 143 pushes the cover control frame 141. Accordingly, when the link 143 rotates in the reverse direction, the discharge cover 222 may be closed. In addition, when the link 143 rotates in the reverse direction, the communication between the internal space of the dustbin 220 and the flow path unit 180 may be blocked. The forward direction may be opposite to the reverse direction.

[0185] The link 143 may connect the cover control frame 141 to the cover control motor 142 and open and close the cover control frame 141 using the power generated by the cover control motor 142.

[0186] For example, the link 143 may include a first link 1431 and a second link 1432. One end portion of the first link 1431 may be coupled to the cover control motor 142. The first link 1431 may be rotated by the power of the cover control motor 142. The other end portion of the first link 1431 may be rotatably coupled to the second link 1432. The first link 1431 may transmit the force transmitted from the cover control motor 142 to the second link 1432. One end portion of the second link 1432 may be coupled to the first link 1431. The other end portion of the second link 1432 may be coupled to the cover control frame 141. The second link 1432 may open and close the discharge cover 222 by pushing or pulling the cover control frame 141.

[0187] The first link 1431 may include a first link body 1431a, a motor coupling portion 1431b, a sensing protrusion 1431c, and a key protrusion 1431d.

[0188] The first link body 1431a may transmit the power generated by the cover control motor 142 to the second link 1432. For example, the first link body 1431a may be formed in a frame shape, and the motor coupling portion 1431b may be disposed on one longitudinal side of the first link body 1431a, and the key protrusion 1431d may be formed on the other longitudinal side. Accordingly, the first link body 1431a may be a rotating body that rotates about the motor coupling portion 1431b.

[0189] The motor coupling portion 1431b may be disposed on the one longitudinal side of the first link body 1431a.

[0190] The motor coupling portion 1431b may be coupled to the cover control motor 142. For example, the motor coupling portion 1431b may be directly coupled to a shaft of the cover control motor 142 or coupled through one or more gears (not illustrated). In this case, the motor coupling portion 1431b may be a rotational axis of the first link 1431.

[0191] Meanwhile, the motor coupling portion 1431b may accommodate at least a portion of the cover control motor 142. For example, the motor coupling portion 1431b may be formed in a cylindrical shape with one closed surface so as to accommodate the shaft or gear of the cover control motor 142. With this configuration, when the cover control motor 142 is operated, the motor coupling portion 1431b may be rotated.

[0192] Meanwhile, the sensing protrusion 1431c may be formed to protrude from an outer circumferential surface of the motor coupling portion 1431b. The sensing protrusion 1431c may be formed as two sensing protrusions at a predetermined distance along the outer circumferential surface of the motor coupling portion 1431b. That is, the sensing protrusion 1431c may be formed such that a first sensing protrusion 1431ca and a second sensing protrusion 1431cb are formed to protrude along the outer circumferential surface of the motor coupling portion 1431b at a predetermined distance. Accordingly, based on a rotation center of the motor coupling portion 1431b, a diameter to a portion in which the sensing protrusion 1431c is formed may be greater than a diameter to the outer circumferential surface of the motor coupling portion 1431b. With this configuration, the motor coupling portion 1431b and the sensing protrusion 1431c

may serve as a kind of cam.

[0193] Meanwhile, the sensing protrusion 1431c may be rotated integrally with the motor coupling portion 1431b. That is, the sensing protrusion 1431c may be rotated together with the rotation of the first link 1431.

[0194] The sensing protrusion 1431c may be in contact with a cover control sensor 144 according to the rotation of the first link 1431. With this configuration, the sensing protrusion 1431c may be configured to detect the rotational position (angle) of the first link 1431 through contact with the cover control sensor 144.

[0195] The first sensing protrusion 1431ca may be disposed to detect a position where the cover control frame 141 closes the discharge cover 222. In addition, the second sensing protrusion 1431cb may be disposed to detect a position where the cover control frame 141 opens the discharge cover 222.

[0196] Meanwhile, the rotation of the link 143 may be restricted by link stoppers 115a and 115b. That is, the rotation of the first link 1431 may be restricted by being caught on the first link stopper 115a and the second link stopper 115b. That is, the rotation of the first link 1431 may be stopped when being in contact with the first link stopper 115a or the second link stopper 115b.

[0197] In addition, at a position where the first link 1431 is caught on the first link stopper 115a, the first sensing protrusion 1431ca may be in contact with the cover control sensor 144. In addition, at a position where the first link 1431 is caught on the second link stopper 115b, the second sensing protrusion 1431cb may be in contact with the cover control sensor 144.

[0198] With this configuration, when the first link 1431 is rotated to a preset position, the rotation of the first link 1431 may be restricted by physical contact with the link stopper 115, and at the same time, a controller 400 may detect the position of the first link 1431 to stop the operation of the cover control motor 142 so that the first link 1431 may be rotated to a correct position.

[0199] Meanwhile, the key protrusion 1431d may be coupled to a key hole 1432b formed in the second link 1432. The key protrusion 1431d may be formed on the other longitudinal side of the first link body 1431a.

[0200] The key protrusion 1431d may be formed to protrude from a surface of the first link body 1431a facing the second link 1432. In this case, the key protrusion 1431d may be formed to be key-coupled to the second link 1432. For example, the key protrusion 1431d may be formed to protrude in a cylindrical shape, and at least one protrusion may be formed to protrude radially outward from the outer circumferential surface.

[0201] The second link 1432 may include a second link body 1432a, a key hole 1432b, and a frame connection portion 1432c.

[0202] The second link body 1432a may transmit power transmitted from the first link 1431 to the cover control frame 141. For example, the second link body 1432a may be formed in a frame shape and may have the key hole 1432b formed on one longitudinal side and the frame connection portion 1432c disposed on the other longitudinal side. Accordingly, the second link body 1432a may be a rotating body that rotates about the key protrusion 1431d.

[0203] The key hole 1432b may be formed in one side of the second link body 1432a. The key hole 1432b may be formed to correspond to the shape of the key protrusion 1431d. For example, the key hole 1432b may be formed in a circular hole shape and may have a quadrangular hole connected radially outward. With this configuration, the key protrusion 1431d may be inserted and coupled according to the shape of the key hole 1432b, and the first link 1431 and the second link 1432 can be prevented from being separated during rotation.

[0204] Accordingly, according to the present invention, the key protrusion 1431d of the first link 1431 and the key hole 1432b of the second link 1432 may be key-coupled, thereby facilitating the assembly or replacement between the first link 1431 and the second link 1432 and preventing the first link 1431 and the second link 1432 from being separated during operation.

[0205] The frame connection portion 1432c may be disposed on the other longitudinal side of the second link body 1432a.

[0206] The frame connection portion 1432c may be coupled to the cover control frame 141. The frame connection portion 1432c may be hinge-coupled to the link coupling unit 141c. In this case, the hinge that couples the frame connection portion 1432c to the cover control frame 141 may be a rotational axis of the second link 1432.

[0207] Meanwhile, in the present invention, a maximum length of the first link 1431 may be smaller than a maximum length of the second link 1432. In addition, the maximum length of the first link 1431 may be smaller than a length from the hinge unit 141b to the link coupling unit 141c of the cover control frame 141. In addition, the length from the hinge unit 141b to the link coupling unit 141c of the cover control frame 141 may be smaller than a rotation radius of the second link 1432 (more specifically, a length from the rotational center of the key hole 1432b to the frame connection portion 1432c of the second link 1432).

[0208] With this configuration, in a case in which the first link 1431 rotates about the motor connection portion 1431b and the cover control frame 141 rotates about the hinge unit 141b, the second link 1432 connecting the first link 1431 to the cover control frame 141 may apply a large force during the process of closing the discharge cover 222.

[0209] That is, during the process of closing the discharge cover 222, a change in rotation angle of the cover control frame 141 according to the rotation of the first link 1431 gradually increases. Accordingly, the discharge cover 222 may be strongly closed by increasing a rotational speed of the cover control frame 141.

[0210] As a result, a force F_c exerted by the cover control frame 141 to close the discharge cover 222

may be amplified more than a force transmitted by the first link 1431 to the second link 1432. Accordingly, even when applying a low-output torque to the first link 1431, the cover control motor 142 may generate a force sufficient to close the discharge cover 222.

[0211] Accordingly, according to the present invention, since the discharge cover 222 may be closed using a low output of the motor, the size of the motor may be decreased, thereby reducing its volume and weight and also reducing noise.

[0212] Meanwhile, the dustbin cover control unit 140 may further include the cover control sensor 144. The cover control sensor 144 may be provided inside the housing 110 and may detect whether the cover control frame 141 is in an open state.

[0213] For example, the cover control sensor 144 may be disposed at a position where it may be in contact with the sensing protrusion 1431c. In addition, the cover control sensor 144 may be disposed at a position where it is not in contact with the outer circumferential surface of the motor coupling portion 1431b. Accordingly, when being in contact with the sensing protrusion 1431c according to the rotation of the first link 1431, the cover control sensor 144 may detect the rotation.

[0214] Accordingly, when the first link 1431 rotates and the first sensing protrusion 1431ca is in contact with the cover control sensor 144, the cover control sensor 144 may detect that the cover control frame 141 has closed the dustbin 220. In addition, when the first link 1431 rotates and the second sensing protrusion 1431cb is in contact with the cover control sensor 144, the cover control sensor 144 may detect that the cover control frame 141 has opened the discharge cover 222.

[0215] The cover control sensor 144 may include a contact sensor. For example, the cover control sensor 144 may include a micro switch.

[0216] The cover control frame 141 may be opened together when the discharge cover 222 of the cleaner 200 is opened. In addition, when the cover control frame 141 is closed, the discharge cover 222 of the cleaner 200 is closed in conjunction therewith.

[0217] When the dust of the dustbin 220 of the cleaner 200 is removed, the cover control motor 142 may couple the discharge cover 222 to the dustbin main body 221 by rotating the cover control frame 141. Specifically, the cover control motor 142 may rotate the cover control frame 141 by rotating the first link 143, and the rotating cover control frame 141 may push the discharge cover 222 toward the dustbin main body 221.

[0218] The cover opening unit 500 according to the present invention will be described with reference to FIGS. 5, 9, and 15 as follows.

[0219] The cleaner station 100 of the present invention may include the cover opening unit 500. The cover opening unit 500 may be disposed below the coupling unit 120 to open the discharge cover 222 of the cleaner 200.

[0220] The cover opening unit 500 may include a pressure moving member 510, a hinge portion 520, a cover opening member 530, a head portion 540, and an air duct 550.

[0221] In this case, the pressure moving member 510, the hinge portion 520, the cover opening member 530, and the head portion 540 may be rotatably disposed inside the air duct 550, and the cover opening member 530 may reciprocate between the interior and exterior of the air duct 550 according to the operation of the dust collection motor 191.

[0222] The pressure moving member 510 may be moved by the suction force of the dust collection motor 191. The pressure moving member 510 may be hinge-coupled to the air duct 550 and rotated by air pressure.

[0223] To this end, the pressure moving member 510 may be formed to block at least a portion of an internal space of the air duct 550. For example, a width of the pressure moving member 510 in a left-right direction may be smaller than, but substantially close to, an inner width of the air duct 550 in the left-right direction. In addition, a length of the pressure moving member 510 in a front-rear direction may be smaller than, but substantially close to, a maximum distance from a rotational center of the pressure moving member 510 to a flow guide portion 553 to be described below.

[0224] With this configuration, the pressure moving member 510 may be moved according to air flow and pressure difference within the air duct 550.

[0225] Meanwhile, the pressure moving member 510 may be formed in a plate shape having a predetermined thickness.

[0226] In this case, the pressure moving member 510 may be formed to have a bent portion 511 bent at a predetermined angle. For example, based on a state in which the dust collection motor 191 is not operated, the pressure moving member 510 may be formed such that a front side on which the cover opening member 530 is disposed is bent to be inclined downward with respect to a rear side connected to the hinge portion 520. With this configuration, when the dust collection motor 191 is operated, a stroke length of the cover opening member 530 can be increased, and the force for pressing the coupling lever 222c can be increased.

[0227] Meanwhile, at least one groove 512 may be formed in a lower surface of the pressure moving member 510. With this configuration, the overall weight of the pressure moving member 510 can be reduced, thereby facilitating movement in response to the operation of the dust collection motor 191. In addition, since a lower surface area of the pressure moving member 510 is increased, the operating performance of the pressure moving member 510 can be improved depending on the flow of air.

[0228] Meanwhile, as illustrated in FIG. 13, a sealer 513 may be further provided on an upper surface of the pressure moving member 510.

[0229] The sealer 513 may seal a space between the upper surface of the pressure moving member 510 and the upper support surface 554 of the air duct 550. In this

case, the sealer 513 may be disposed to surround the upper surface of the pressure moving member 510.

[0230] Meanwhile, the sealer 513 may be made of various materials capable of providing airtightness.

[0231] With this configuration, the pressure moving member 510 may respond more sensitively when the suction force of the dust collection motor 191 is applied, and in a state in which the coupling lever 222c is pressed, a space between the air duct 550 and the flow path unit 180 may be sealed, thereby improving dust collection performance.

[0232] In addition, when the sealer 513 is made of an elastic material, the sealer 513 may absorb an impact when the upper surface of the pressure moving member 510 is in contact with the air duct 550, thereby preventing damage to the pressure moving member 510 or the air duct 550.

[0233] The hinge portion 520 may be disposed on one longitudinal side of the pressure moving member 510 and coupled to the air duct 550 to provide the rotational center of the pressure moving member 510.

[0234] For example, the hinge portion 520 is formed at a rear end of the pressure moving member 510, and at least a portion thereof is formed in a curved shape to be rotatably coupled. In this case, the hinge portion 520 may be coupled to the air duct 550 and a portion of the housing 110 connected to the air duct 550.

[0235] In this case, the hinge portion 520 may provide the pressure moving member 510 with a rotational axis formed in the left-right direction of the cleaner station 100. Accordingly, the pressure moving member 510 may vertically rotate about the hinge portion 520.

[0236] The cover opening member 530 is formed to protrude and extend from the pressure moving member 510 toward the coupling lever 222c of the dustbin 220 and disposed so as to press the coupling lever 222c as the pressure moving member 510 rotates.

[0237] The cover opening member 530 may be formed to protrude from the upper surface of the pressure moving member 510 and protrude at a predetermined angle with respect to the extension direction of the pressure moving member 510. In this case, the cover opening member 530 may be formed to protrude and extend circumferentially from the upper surface of the pressure moving member 510 with the rotational center of the hinge portion 520 as its origin. With this configuration, when the pressure moving member 510 rotates, collisions between the cover opening member 530 and other structures can be minimized, and the coupling lever 222c can be pressed with sufficient momentum.

[0238] The head portion 540 may be disposed on the other longitudinal side of the pressure moving member 510 and may be in contact with the air duct 550 during operation of the pressure moving member 510.

[0239] For example, the head portion 540 may be formed at a front end of the pressure moving member 510 and formed to be thicker than the pressure moving member 510, and at least a portion of the front end may have a curved shape.

[0240] With this configuration, the head portion 540 may absorb an impact even when colliding with a stopper 552 and the upper surface of the air duct 550 as the pressure moving member 510 rotates, and have the effect of sealing a space between the flow path unit 180 and the air duct 550.

[0241] The air duct 550 has a flow path, through which air flows when the dust collection motor 191 operates, formed therein, accommodates the pressure moving member 510, and is configured such that the pressure moving member 510 to move along the flow path.

[0242] The air duct 550 includes a duct main body 551, the stopper 552, the flow guide portion 553, the upper support surface 554, and a ventilation hole 555.

[0243] The duct main body 551 may be provided within the housing 110 and disposed below the coupling portion 120 in a gravity direction.

[0244] The duct main body 551 may have a movement space for the pressure moving member 510. For example, the duct main body 551 may be formed in a box shape similar to a hexahedron. In this case, a width in the left-right direction and a length in the front-rear direction of the internal space of the duct main body 551 may be greater than or equal to a width in the left-right direction and a length in the front-rear direction of the pressure moving member 510.

[0245] The duct main body 551 may have a space through which air may flow. An upper end of the duct main body 551 may be connected to the dustbin guide surface 122, and a cover opening hole 122a may be formed in an upper end 551a of the duct main body 551 and the dustbin guide surface 122. In addition, the ventilation hole 555 may be formed in a lower portion of the duct main body 551. Accordingly, when the dust collection motor 191 is operated, air may be introduced through the ventilation hole 555, may flow inside the duct main body 551, flow into the bypass flow path 122b through the cover opening hole 122a, and flow to the dust collection motor 191 through the flow path unit 180.

[0246] That is, a cover opening flow path 556 may be formed in the duct main body 551, and when the dust collection motor 191 operates, air may flow through the duct main body 551 to move the pressure moving member 510 provided therein.

[0247] The stopper 552 may be formed to protrude from an inner surface of the duct main body 551 and may restrict the downward movement of the pressure moving member 510. For example, the stopper 552 may be bent to be inclined downward and rearward from a lower end of the flow guide portion 553 formed to protrude from the inner surface of the duct main body 551.

[0248] Accordingly, when the pressure moving member 510 is rotated downward due to gravity, the downward rotation may be restricted by contact with the stopper 552. In this case, the stopper 552 and the pressure moving member 510 may be in airtight contact with each other.

[0249] The flow guide portion 553 may be formed to protrude from the inner surface of the duct main body 551 to guide the flow path of air. Specifically, the flow guide portion 553 may be formed to protrude downward from the interior of the upper surface of the duct main body 551.

[0250] In this case, the flow guide portion 553 may be formed in a shape that draws an arc in the circumferential direction with the rotational center of the pressure moving member 510 as its origin. With this configuration, the space between the front end of the pressure moving member 510 and the flow guide portion 553 can be minimized during the rotation of the pressure moving member 510, thereby maximizing the response performance of the pressure moving member 510 when the dust collection motor 191 operates.

[0251] Meanwhile, a length of the duct main body 551 in the front-to-rear direction is greater than the shortest distance from a rear end of the duct main body 551 to the stopper 552. Accordingly, when the dust collection motor 191 operates, as air passes through the stopper 552, a flow velocity may increase, thereby allowing the pressure moving member 510 to be rotated even with a small output of the dust collection motor 191. In addition, since the groove 512 of the pressure moving member 510 is formed to have the same region as a region from the rear end of the duct main body 551 to the stopper 552, the air with increased flow velocity may push up a wider surface area of the pressure moving member 510, thereby maximizing the response performance of the pressure moving member 510.

[0252] The upper support surface 554 may refer to a rear upper surface of the duct main body 551. In the present embodiment, a front upper surface of the duct main body 551 may be the dustbin guide surface 122. The upper support surface 554 may be formed to be inclined downward at a predetermined angle from the dustbin guide surface 122. That is, the upper support surface 554 may be formed to be inclined at a predetermined angle with respect to the floor. In this case, an inclination angle of the upper support surface may be the same as the inclination of the bent portion 511 of the pressure moving member 510. With this configuration, when the pressure moving member 510 is rotated upward, the upper surface of the pressure moving member 510 may be in close contact with the upper support surface 554, thereby enhancing the airtightness effect.

[0253] The ventilation hole 555 may be formed in a lower side of the duct main body 551 to allow external air to be introduced therethrough. Here, the term "external air" may refer to air other than air flowing through the flow path unit 180.

[0254] For example, the ventilation hole 555 may be formed as a plurality of circular holes each having a predetermined diameter. This is to ensure that air within the duct main body 551 flows evenly, compared to when a single hole of a relatively large diameter is formed, and to minimize the impact on air flow even when the single hole is blocked by foreign substances.

[0255] Meanwhile, the cover opening flow path 556 according to the present invention is formed in a direction intersecting the bypass flow path 122b, and the bypass flow path 122b is formed in a direction intersecting the flow path unit 180. Consequently, at least portions of the cover opening flow path 556 and the flow path unit 180 may be parallel, but their flow directions may be opposite.

[0256] In addition, the cover opening flow path 556 may be formed in a direction intersecting the extension of the longitudinal axis of the dustbin 220. In addition, the cover opening flow path 556 may be formed parallel to the suction flow path.

[0257] Accordingly, the movement direction of the cover opening member 530 may intersect the extension of the longitudinal axis of the dustbin 220, and the cover opening member 530 may move in a direction intersecting the longitudinal direction of the dustbin 220. That is, the cover opening member 530 may be moved from the outer circumferential surface of the cylindrical dustbin 220 toward an interior of the dustbin 220 in the radial direction.

[0258] Meanwhile, the operation process of the cover opening unit 500 according to one embodiment of the present invention will be described with reference to FIGS. 14 and 15 as follows.

[0259] During the operation of the dust collection motor 191, negative pressure may be applied to the bypass hole 122c by the suction force of the dust collection motor 191. Accordingly, air on the bypass flow path 122b may be introduced into the flow path unit 180, and negative pressure may be applied to a space formed between the pressure moving member 510 and the dustbin guide surface 122 and the cover opening flow path 556 (see FIG. 14).

[0260] Accordingly, upward pressure may be applied to the pressure moving member 510, and the pressure moving member 510 may rotate about the hinge portion 520. Accordingly, the cover opening member 530 may rotate together with the pressure moving member 510 to press the coupling lever 222c.

[0261] In this case, a direction in which the cover opening unit 500 presses the coupling lever 222c may intersect the longitudinal direction of the dustbin 220.

[0262] Through this process, as the coupling lever 222c is rotated by the cover opening unit 500, hook coupling between the dustbin main body 221 and the discharge cover 222 is released (see FIG. 15). In this case, since the discharge cover 222 may be provided with a torsion spring 222d, the discharge cover 222 may be rotated by a predetermined angle or more and supported at the rotated position by the elastic force of the torsion spring 222d. Accordingly, the discharge cover 222 may be opened so that the dust through-hole 121a may communicate with the interior of the dustbin 220.

[0263] Meanwhile, FIGS. 16 and 17 are views for describing a cover opening unit of a cleaner station according to another embodiment of the present invention.

[0264] A cover opening unit according to another embodiment of the present invention will be described with reference to FIGS. 16 and 17 as follows.

[0265] A cover opening unit 1500 according to the present embodiment includes a pressure moving member 1510, a support 1520, a cover opening member 1530, and an air duct 1550.

[0266] Meanwhile, to avoid repeated description, the configuration and effects of the cover opening unit 500 according to one embodiment of the present invention may be used, except for contents specifically described in the present embodiment.

[0267] The pressure moving member 1510 of the present embodiment may be accommodated within the air duct 1550 and may perform linear reciprocating motion when the dust collection motor 191 operates. For example, the pressure moving member 1510 may be formed in a rectangular prism shape having a predetermined thickness.

[0268] In this case, the size of the pressure moving member 1510 may be slightly smaller than an internal space of the air duct 1550. For example, a left-right width and front-rear length of the internal space of the air duct 1550 are greater than a left-right width and front-rear length of the pressure moving member 1510 and smaller than the shortest diagonal of the pressure moving member 1510.

[0269] With this configuration, even when air flows within the air duct 1550, the pressure moving member 1510 is not rotated and may perform linear reciprocating motion within the air duct 1550.

[0270] In addition, even without a separate guide rail within the air duct 1550, the pressure moving member 1510 may move linearly.

[0271] The support 1520 may be formed to extend upward from the rear of the pressure moving member 1510 and connected to the cover opening member 1530 to support the cover opening member 1530.

[0272] The support 1520 can prevent the cover opening member 1530 from being deformed or damaged when colliding with the dustbin guide surface 122 or the coupling lever 222c during the upward movement of the cover opening member 1530.

[0273] The cover opening member 1530 may be formed to protrude upward from the pressure moving member 1510. When the suction force of the dust collection motor 191 is applied, the cover opening member 1530 may move linearly toward the coupling lever 222c.

[0274] The cover opening member 1530 includes a pressing surface 1531 and a guide surface 1532.

[0275] The pressing surface 1531 may press the coupling lever 222c when the dust collection motor 191 operates.

[0276] The pressing surface 1531 may be formed to be inclined at a predetermined angle with respect to the floor. In this case, an inclination angle of the pressing surface 1531 is greater than a rotational angle of the coupling lever 222c for opening the discharge cover 222.

[0277] With this configuration, when the pressing surface 1531 sufficiently moves upward, the coupling lever 222c is rotated by the inclination of the pressing surface 1531, thereby releasing the coupling between the dustbin main body 221 and the discharge cover 222.

[0278] The guide surface 1532 may guide the upward movement of the pressure moving member 1510. During upward movement of the pressure moving member 1510, when the dustbin guide surface 122 and the cover opening member 1530 comes into contact with each other, the pressure moving member 1510 may move along the guide surface 1532 and guide the cover opening member 1530 to pass through the dust through-hole 122a.

[0279] The guide surface 1532 may be formed to be inclined at a predetermined angle with respect to the floor. In this case, the inclination of the guide surface 1532 with respect to the floor may be greater than the inclination of the pressing surface 1531 with respect to the floor.

[0280] Meanwhile, an uppermost end of the pressing surface 1531 and an uppermost end of the guide surface 1532 may match with each other. Accordingly, this may be referred to as the uppermost end of the cover opening member 1530. The uppermost end of the cover opening member 1530 may be disposed in front of the rotational axis of the coupling lever 222c. Accordingly, when the cover opening member 1530 moves upward, the uppermost end of the cover opening member 1530 may first come into contact with the coupling lever 222c, and the coupling lever 222c may be pressed in an opening direction.

[0281] The air duct 1550 has a flow path, through which air flows when the dust collection motor 191 operates, formed therein, accommodates the pressure moving member 1510, and is configured such that the pressure moving member 1510 to move along the flow path.

[0282] Meanwhile, the dust collection unit 170 will be described with reference to FIGS. 5 and 18 as follows.

[0283] 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 below the coupling unit 120 in a gravity direction.

[0284] For example, the dust collection unit 170 may be a dust bag for collecting dust suctioned from the inside of the dustbin 220 of the cleaner 200 by the dust collection motor 191.

[0285] The dust collection unit 170 may be detachably coupled to the housing 110.

[0286] Accordingly, the dust collection unit 170 may be separated from the housing 110 and discarded, and a new dust collection unit 170 may be coupled to the housing 110. That is, the dust collection unit 170 can be defined as a consumable component.

[0287] A dust bag may be provided so that, when a suction force is generated by the dust collection motor 191, its volume increases so that dust is accommodated therein.

[0288] To this end, the dust bag may be made of a material that allows air to pass therethrough but blocks foreign substances such as dust. For example, the dust bag may be made of a non-woven material and may have a hexahedral shape based on when the volume increases.

[0289] Accordingly, since the user does not need to separately tie a bag or the like in which dust has been collected, user convenience can be improved.

[0290] Alternatively, the dust bag may include roll vinyl (not illustrated). With this configuration, when the dust bag is sealed or bonded, dust or odor collected inside the dust bag can be prevented from leaking out of the dust bag. In this case, the dust bag may be mounted on the housing 110 through a dust bag cartridge (not illustrated). If necessary, the dust bag may be replaced through the dust bag cartridge.

[0291] Meanwhile, the flow path unit 180 will be described with reference to FIGS. 5 and 18 as follows.

[0292] The cleaner station 100 may include the flow path unit 180.

[0293] The flow path unit 180 may connect the dustbin 220 of the cleaner 200 to the dust collection unit 170. The flow path unit 180 may be disposed behind the coupling surface 121. The flow path unit 180 may be formed between the dustbin 220 of the cleaner 200 and the dust collection unit 170. The flow path unit 180 may be formed behind the dust through-hole 121a and formed to be bent downward from the dust through-hole 121a so that dust and air flow therethrough.

[0294] Specifically, the flow path unit 180 may include the first flow path 181 connected the internal space of the dustbin 220 when the cleaner 200 is coupled to the cleaner station 100 and the dust through-hole 121a is opened, and a second flow path 182 configured to allow communication between the first flow path 181 and an internal space of the dust collection unit 170.

[0295] For example, the first flow path 181 may be disposed substantially parallel to an axial line of the suction motor 214 or a virtual center line passing through the dustbin 220. In this case, the axial line of the suction motor 214 or the center line of the dustbin 220 may pass through the first flow path 181.

[0296] In this case, the second flow path 182 may form a predetermined angle with the first flow path 181. For example, the first flow path 181 and the second flow path 182 may be formed at a right angle to each other. With this configuration, it is possible to minimize the overall volume of the cleaner station 100.

[0297] The second flow path 182 may extend downward from the first flow path 181 and communicate with the first flow path 181 to guide the air passing through the first flow path 181 to the dust collection unit 170.

[0298] The second flow path 182 may be disposed in a direction parallel to an axial line C of the dust collection motor 191. With this configuration, a reduction in the suction force of the dust collection motor 191 in the first flow path 181 and the second flow path 182 can be minimized.

[0299] The dust in the dustbin 220 of the cleaner 200 may be moved to the dust collection unit 170 through the flow path unit 180.

[0300] Meanwhile, the dust suction module 190 will be described with reference to FIGS. 5 and 18 as follows.

[0301] The cleaner station 100 may include the dust suction module 190. The dust suction module 190 may include the dust collection motor 191, a first filter (not illustrated), and a second filter (not illustrated).

[0302] The dust collection motor 191 may be disposed below the dust collection unit 170. The dust collection motor 191 may generate a suction force in the flow path unit 180. Accordingly, the dust collection motor 191 may provide the suction force capable of sucking dust from the dustbin 220 of the cleaner 200.

[0303] The dust collection motor 191 may generate the suction force by its rotation. For example, the dust collection motor 191 may be formed in a shape similar to a cylinder.

[0304] Meanwhile, in the present embodiment, a virtual dust collection motor axial line C extending from a rotational axis of the dust collection motor 191 may be defined.

[0305] The first filter (not illustrated) may be disposed between the dust collection unit 170 and the dust collection motor 191. The first filter may be a pre-filter.

[0306] The second filter (not illustrated) may be disposed between the dust collection motor 191 and the outer wall surface 112. The second filter (not illustrated) may be a HEPA filter.

[0307] Meanwhile, the cleaner station 100 may further include a charging unit 128. The charging unit 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 electric power to a battery of the cleaner 200 coupled to the coupling unit 120.

[0308] In addition, the cleaner station 100 may further include a side door (not illustrated). The side door may be disposed in the housing 110. The side door may selectively expose the dust collection unit 170 to the outside. Accordingly, the user can easily remove the dust collection unit 170 from the cleaner station 100.

[0309] Meanwhile, FIG. 18 illustrates a block diagram for describing a control configuration of the cleaner station according to the embodiment of the present invention.

[0310] The control configuration of the cleaner station 100 of the present invention will be described with reference to FIG. 18 as follows.

[0311] 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 dustbin cover control unit 140, the dust collection unit 170, the flow path unit 180, and the dust suction module 190.

[0312] The controller 400 may include a printed circuit

board and elements mounted on the printed circuit board.

[0313] When the coupling sensor 125 detects coupling of the cleaner 200, the coupling sensor 125 may transmit a signal indicating that the cleaner 200 is 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 is coupled to the coupling unit 120.

[0314] In addition, when the charging unit 128 supplies electric power to the battery 240 of the cleaner 200, the controller 400 may determine that the cleaner 200 is coupled to the coupling unit 120.

[0315] When it is determined that the cleaner 200 has been fixed to the coupling unit 120, the controller 400 may open the cover control frame 141 of the cleaner station 100 by operating the cover control motor 142.

[0316] The cover control sensor 144 may transmit a signal indicating that the cover control frame 141 is closed when in contact with the first sensing protrusion 1431ca. The controller 400 may stop the operation of the cover control motor 142 when it is determined that the cover control frame 141 is closed.

[0317] The cover control sensor 144 may transmit a signal indicating that the cover control frame 141 is opened when in contact with the second sensing protrusion 1431cb. The controller 400 may stop the operation of the cover control motor 142 when it is determined that the cover control frame 141 is opened.

[0318] The controller 400 may suck dust from the dustbin 220 by driving the dust collection motor 191.

[0319] The controller 400 may display a dustbin emptying situation and charging situation of the cleaner 200 by operating a display unit 410.

[0320] Meanwhile, the cleaner station 100 of the present invention may include the display unit 410.

[0321] The display unit 410 may be disposed in the housing 110 and in a separate display device and provided in a terminal such as a mobile phone.

[0322] 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, etc. of an ongoing operation through information output through the display unit.

[0323] 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.

[0324] 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 input by the user to control the operation of the cleaner station 100. To this end, the input unit 440 may include a key pad, a dome switch, a touch pad (static pressure/electrostatic), etc. In particular, when the touch pad forms a layered structure with the display unit 410, the touch pad may be referred to as a "touch screen."

[0325] FIG. 19 illustrates a flowchart for describing a control method for a cleaner system according to the present invention.

[0326] A control method of a cleaner station according to the embodiment of the present invention will be described with reference to FIGS. 5 to 19 as follows.

[0327] The control method of a cleaner station of the present invention includes a coupling checking operation S10, a cover opening operation S20, a dust collecting operation S30, and a cover closing operation S40.

[0328] The coupling checking operation S10 may include determining whether the cleaner 200 is coupled to the coupling unit 120 of the cleaner station 100.

[0329] Specifically, in the coupling checking operation S10, when the cleaner 200 is coupled to the coupling unit 120, the coupling sensor 125 may be in contact with the battery housing 230, and the coupling sensor 125 may transmit a signal indicating that the cleaner 200 is coupled to the coupling unit 120. Alternatively, according to an embodiment, a non-contact sensor type coupling sensor 125 disposed on the sidewall 124 may detect the presence of the dustbin 220, and the coupling sensor 125 may transmit a signal indicating that the cleaner 200 is coupled to the coupling unit 120.

[0330] Accordingly, in the coupling checking operation S10, the controller 400 may receive a signal generated from the coupling sensor 125 to determine that the cleaner 200 is coupled to the coupling unit 120.

[0331] Alternatively, in the coupling checking operation S10 of the present invention, the controller 400 may determine whether the charging unit 128 supplies electric power to the battery 240 of the cleaner 200 and detect whether the cleaner 200 is coupled to a correct position.

[0332] In the cover opening operation S20, the controller 400 may open the discharge cover 222 of the cleaner 200 when the dustbin 220 is coupled to the cleaner station 100.

[0333] The controller 400 may operate the dust collection motor 191 to fix the dustbin 220 and open the discharge cover 222 of the dustbin 220.

[0334] Specifically, when the dust collection motor 191 is operated, the suction force of the dust collection motor 191 may cause the fixing member 131 to move toward the dustbin. For example, although not illustrated, when the dust collection motor 191 is operated, negative pressure may be applied to the fixing member 131 through a pipe connected to the lower side of the fixing member 131, and the fixing member 131 may move toward the dustbin 220 to press and fix the outer circumferential surface of the dustbin 220.

[0335] Accordingly, according to the present invention, the time required to fix the cleaner 200 or release the fixation of the cleaner 200 can be reduced, thereby reducing the overall operation time.

[0336] At the same time, in a state in which the discharge cover 222 is closed, negative pressure is applied to the flow path unit 180 by the suction force of the dust collection motor 191, and negative pressure is applied to the bypass hole 122c and the cover opening hole 122a

that communicate with the flow path unit 180. Accordingly, the pressure moving member 510 and the cover opening member 530 may move to press the coupling lever 222c. Consequently, as the coupling lever 222c rotates, binding between the discharge cover 222 and the dustbin main body 221 is released.

[0337] Meanwhile, the discharge cover 222 released from binding may be rotated away from the dustbin 220 by the elastic force of the torsion spring 222d, but may be controlled while being in contact with the cover control frame 141.

[0338] Meanwhile, in the cover opening operation S20, the controller 400 may open the cover control frame 141.

[0339] Specifically, when the controller 400 receives a signal indicating that the dustbin 220 is coupled, the controller 400 may operate the cover control motor 142 in the forward direction to rotate the first link 1431 to be lifted upward. In this case, the first link 1431 may lift one side of the second link 1432, and the other side of the second link 1432 may lift the cover control frame 141. As a result, the cover control frame 141 may open the dust through-hole 121a by its rotation. That is, in the cover opening operation S20, the controller 400 may rotate the cover control frame 141 to open the dust through-hole 121a.

[0340] Meanwhile, in the present embodiment, the controller 400 may operate the cover control motor 142 in the forward direction after receiving the signal indicating that the dustbin 220 is coupled and a preset time has elapsed.

[0341] With this configuration, in the cover opening operation S20, the cover control frame 141 may be opened after waiting for the time required for the push protrusion 151 to start to press the coupling lever 222c, and the discharge cover 222 and the cover control frame 141 may be opened at substantially the same time. Accordingly, it is possible to prevent the discharge cover 222 from being suddenly opened by the restoring force of the torsion spring 222d to cause a strong collision between the cover control frame 141 and the discharge cover 222 in a state in which the cover control frame 141 rotates first and the dust through-hole 121a is opened, or prevent the discharge cover 222 and the dustbin main body 221 from failing to separate because the cover control frame 141 is not opened even when the hook-coupling between the discharge cover 222 and the dustbin main body 221 is released.

[0342] As a result, when the cover opening operation S20 is performed, the discharge cover 222 of the dustbin 220 may open the internal space of the dustbin main body 221 by its rotation, and the cover control frame 141 may open the dust through-hole 121a by its rotation so that the internal space of the dustbin 220 may communicate with the flow path unit 180 (specifically, the first flow path 181) of the cleaner station 100.

[0343] Meanwhile, when detecting the second sensing protrusion 1431cb, the cover control sensor 144 may transmit a signal indicating that the second sensing protrusion 1431cb is detected. Accordingly, the controller 400 may determine that the cover control frame 141 is open and stop the operation of the cover control motor 142.

[0344] Alternatively, according to an embodiment, the controller 400 may operate the cover control motor 142 for a preset time. For example, the controller 400 may operate the cover control motor 142 in the forward direction for 5 seconds or more and 7 seconds or less and then stop the operation of the cover control motor 142.

[0345] Alternatively, according to an embodiment, the controller 400 may detect the load of the cover control motor 142 when the link 143 is in contact with the link stopper 115 and stop the operation of the cover control motor 142.

[0346] In this case, the controller 400 may enter the dust collecting operation S30.

[0347] In the dust collecting operation S30, the dust collection motor 191 may be operated to collect dust from the dustbin 220.

[0348] For example, the controller 400 may continue to operate the dust collection motor 191 after the cover opening operation S20.

[0349] In the dust collecting operation S30, the controller 400 may operate the dust collection motor 191 to rotate at a preset dust collection speed for a preset dust collection time. For example, in the dust collecting operation S30, the controller 400 may operate the dust collection motor 191 to rotate at the dust collection speed for 5 seconds or more and 9 seconds or less after it is determined that the cover control frame 141 is open, but the present invention is not limited thereto, and the dust collection time may be set according to the output of the dust collection motor 191 and an amount of dust stored inside the dustbin 220.

[0350] According to the dust collecting operation S30, the dust inside the dust in 220 may pass through the dust through-hole 121a and the flow path unit 180 and may be collected by the dust collection unit 170. Accordingly, since the user may remove the dust inside the dustbin 220 even without separate operation, user convenience can be provided.

[0351] Meanwhile, the control method of the cleaner station according to one embodiment of the present invention may further include the cover closing operation S40 of blocking the dust through-hole 121a by rotating the cover control frame 141 after the operation of the dust collection motor 191 ends. That is, in the cover closing operation S40, when the operation of the dust collection motor 191 ends, the link 143 may be re-rotated.

[0352] In the cover closing operation S40, the controller 400 may operate the cover control motor 142 in a direction opposite to the operating direction of the cover control motor 142 in the cover opening operation S20.

[0353] Specifically, in the cover opening operation S20, the first link 1431 is caught on the second link stopper 115b, and the cover control sensor 144 detects the second sensing protrusion 1431cb to stop the opera-

tion of the cover control motor 142 operating in the forward direction. Thereafter, in the cover closing operation S40, the cover control motor 142 is operated in the reverse direction.

[0354] That is, in the cover closing operation S40, the controller 400 may change the rotational direction of the shaft of the cover control motor 142.

[0355] For example, after the operation of the dust collection motor 191 ends, the controller 400 may operate the cover control motor 142 in the reverse direction to rotate the cover control frame 141.

[0356] Specifically, the controller 400 may operate the cover control motor 142 in the reverse direction after the operation of the dust collection motor 191 ends, thereby rotating the first link 1431 downward. In this case, the first link 1431 may lower one side of the second link 1432, and the other side of the second link 1432 may lower the cover control frame 141. As a result, the cover control frame 141 may close the dust through-hole 121a by its rotation. That is, in the cover closing operation S40, the controller 400 may rotate the cover control frame 141 to close the dust through-hole 121a.

[0357] In this case, when detecting the first sensing protrusion 1431ca, the cover control sensor 144 may transmit a signal indicating that the first sensing protrusion 1431ca is detected. Accordingly, the controller 400 may determine that the cover control frame 141 closes the dust through-hole 121a and stop the operation of the cover control motor 142.

[0358] Alternatively, according to an embodiment, the controller 400 may operate the cover control motor 142 for a preset time. For example, the controller 400 may operate the cover control motor 142 in the reverse direction for 5 seconds or more and 7 seconds or less and stop the operation of the cover control motor 142.

[0359] Accordingly, according to the present invention, the controller 400 can precisely control the movement of the cover control frame 141 by changing the operation direction of the cover control motor 142 after the first link 1431 is caught on the link stopper 115 even without using an encoder or the like, thereby controlling the discharge cover 222.

[0360] In addition, according to the present invention, the cover control frame 141 may be moved together with operation of the dust collection motor 191 to open the discharge cover 222 of the dustbin, and the discharge cover 222 may be closed when the operation of the dust collection motor 191 ends, thereby reducing the time required for dust collection from the dustbin 220.

[0361] 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.

[0362] 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.

Claims

1. A cleaner station comprising:

   a housing;
   a cover opening unit configured to open a dustbin of a cleaner;
   a dust collection unit which is accommodated inside the housing and collects dust from the dustbin; and
   a dust collection motor which is accommodated inside the housing and generates a suction force of sucking the dust from the dustbin,
   wherein the cover opening unit is operated by the suction force generated by the dust collection motor.

2. The cleaner station of claim 1, wherein the cover opening unit includes:

   a pressure moving member moved by the suction force of the dust collection motor; and
   a cover opening member disposed to protrude from the pressure moving member toward the dustbin.

3. The cleaner station of claim 2, wherein the pressure moving member is hinge-coupled to the housing and rotates toward the dustbin when the suction force generated by the dust collection motor is applied.

4. The cleaner station of claim 2, wherein the pressure moving member moves linearly toward the dustbin when the suction force of the dust collection motor is applied.

5. The cleaner station of claim 2, wherein the cover opening member is formed to protrude from the pressure moving member and formed to be inclined at a predetermined angle with respect to an extension direction of the pressure moving member.

6. The cleaner station of claim 2, wherein the dustbin includes:

   a dustbin main body in which dust is stored and an internal space is opened and closed by a discharge cover; and
   a coupling lever configured to rotate when pressed by the cover opening member to release coupling between the discharge cover and the dustbin body.

7. The cleaner station of claim 2, wherein the cover

opening unit further includes an air duct in which the pressure moving member is movably accommodated and a flow path through which air flows when the dust collection motor is operated is formed.

8. The cleaner station of claim 7, wherein the air duct includes:

a duct main body including a movement space for the pressure moving member; and
a stopper which is formed to protrude from an inner surface of the duct main body and restricts downward movement of the pressure moving member.

9. The cleaner station of claim 8, wherein the air duct includes:

a cover opening hole which is formed at an upper end of the duct main body and through which the cover opening member passes; and
an upper support surface formed on an upper portion of the duct main body and formed to be inclined downward at a predetermined angle from the upper end of the duct main body, and
when the dust collection motor is operated, air passes through the cover opening hole and flows through a space between the upper support surface and the dustbin.

10. The cleaner station of claim 8, wherein the air duct further includes a flow guide portion which is formed to protrude from the inner surface of the duct main body and guides a flow path of the air.

11. The cleaner station of claim 4, wherein the pressure moving member moves linearly in a direction parallel to a virtual dust collection motor axis line extending from an axis of the dust collection motor.

12. The cleaner station of claim 6, wherein a direction in which the cover opening unit presses the coupling lever intersects a longitudinal direction of the dustbin.

13. The cleaner station of claim 1, further comprising:

a flow path unit in which a flow path configured to allow an internal space of the dustbin to communicate with an internal space of the dust collection unit is formed; and
a bypass flow path which is formed between an upper surface of the cover opening unit and the dustbin and communicates with the flow path unit,
wherein the cover opening unit includes an air duct in which a flow path through which air flows when the dust collection motor is operated is formed, and
the air duct includes:

a duct main body in which a cover opening flow path configured to communicate with the bypass flow path is formed and a cover opening member moved by the suction force generated by the dust collection motor is accommodated; and
a cover opening hole which is formed at an upper end of the duct main body and through which the cover opening member passes.

14. The cleaner station of claim 13, wherein the air duct includes a ventilation hole formed in a lower side of the duct main body to allow external air to be introduced therethrough.

15. A cleaner system comprising:

a cleaner including a suction unit in which a suction flow path through which air flows is formed, a suction motor configured to generate a suction force to suck air along the suction unit, a dust separator configured to separate dust from the air introduced through the suction unit, and a dustbin configured to store the dust separated by the dust separator; and
a cleaner station including a coupling unit to which the dustbin is coupled, a dust collection unit configured to collect dust from the dustbin, a dust collection motor configured to generate a suction force to suck the dust from the dustbin into the dust collection unit, and a housing configured to accommodate the dust collection unit and the dust collection motor,
wherein the cleaner station further includes a cover opening unit configured to open the dustbin, and
the cover opening unit includes a cover opening member moved by the suction force generated by the dust collection motor, and a moving direction of the cover opening member intersects an extension of a longitudinal axis of the dustbin.

16.

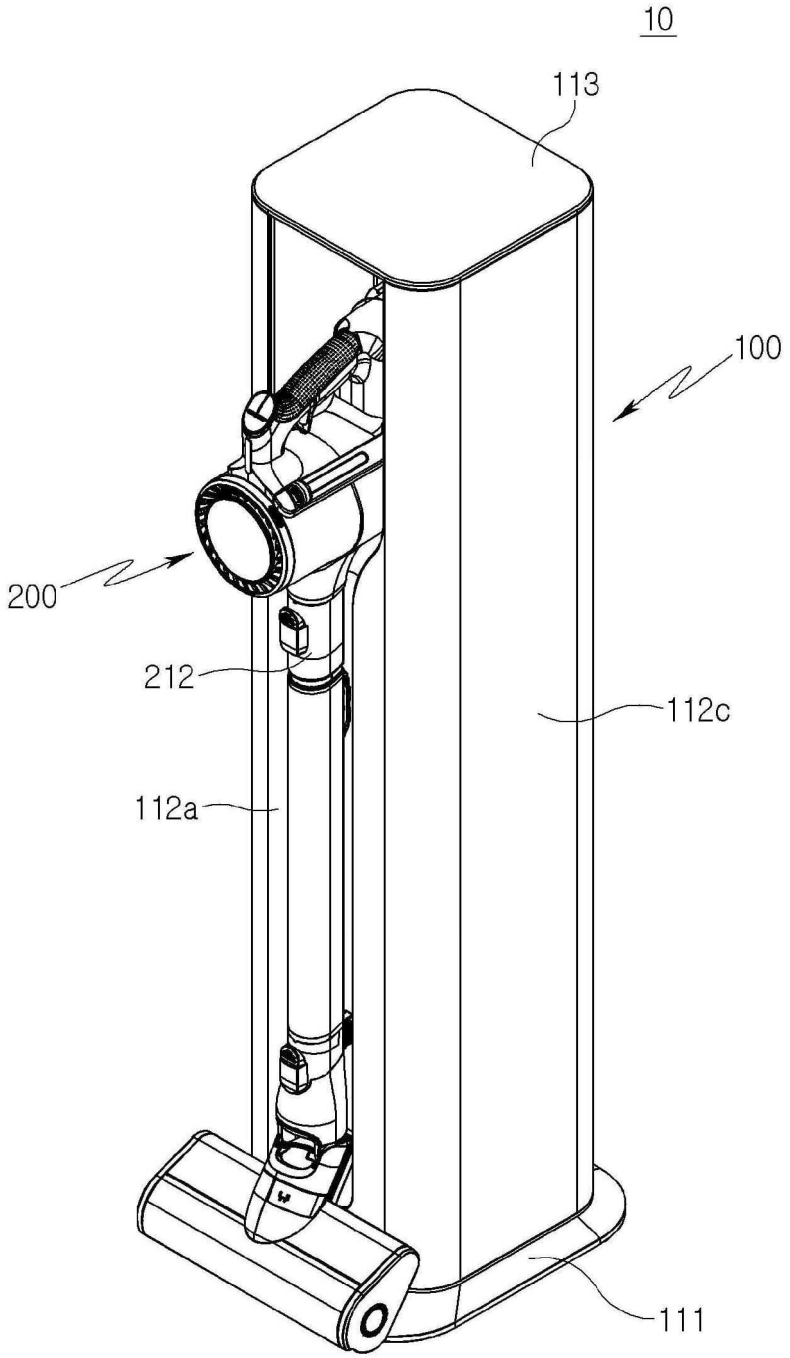
The cleaner system of claim 15, wherein the cover opening unit further includes an air duct in which a cover opening flow path through which air flows by the suction force generated by the dust collection motor is formed and the cover opening member is accommodated, and
the cover opening flow path is formed in a direction intersecting the extension of the longitudinal axis of the dustbin.

17. The cleaner system of claim 15, wherein the cleaner station further includes:

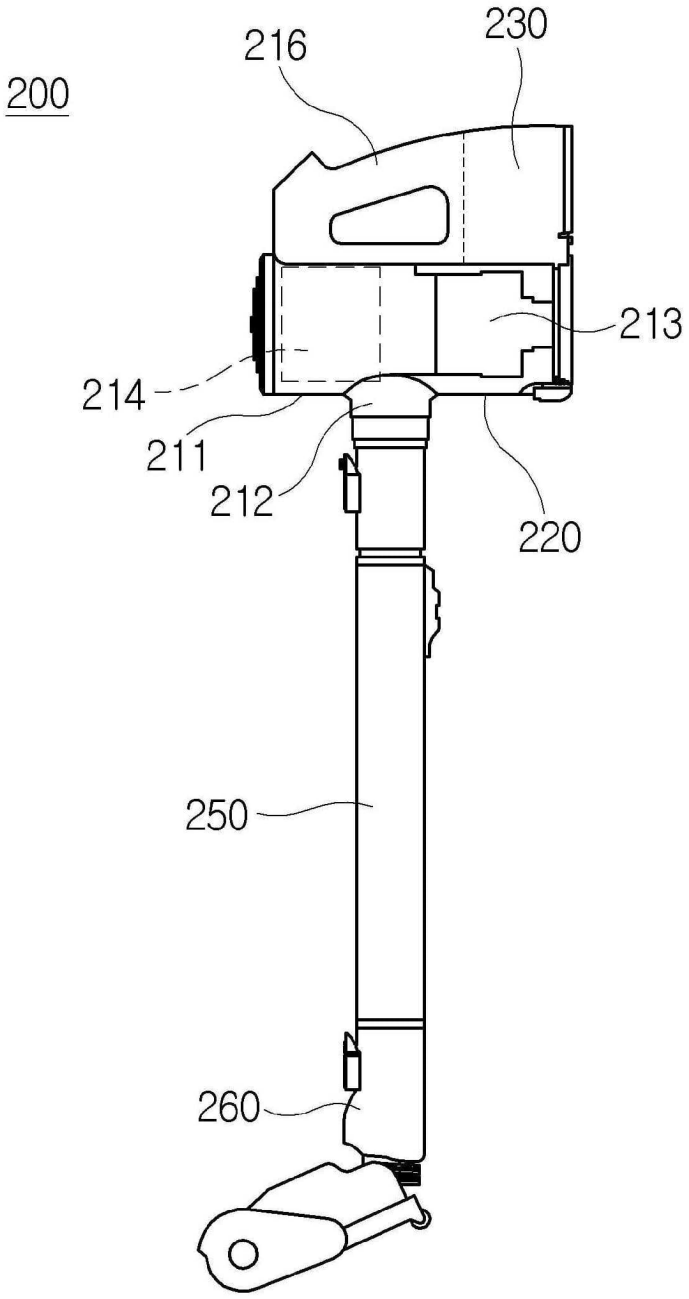
a flow path unit in which a flow path configured to allow an internal space of the dustbin to communicate with an internal space of the dust collection unit is formed; and
a bypass path unit configured to allow a cover opening hole formed in the coupling unit to communicate with the flow path unit, and
the bypass flow path is formed in a direction intersecting a direction in which the suction flow path is formed.

18. The cleaner system of claim 15, wherein the suction flow path is formed in a direction intersecting the extension of the longitudinal axis of the dustbin.

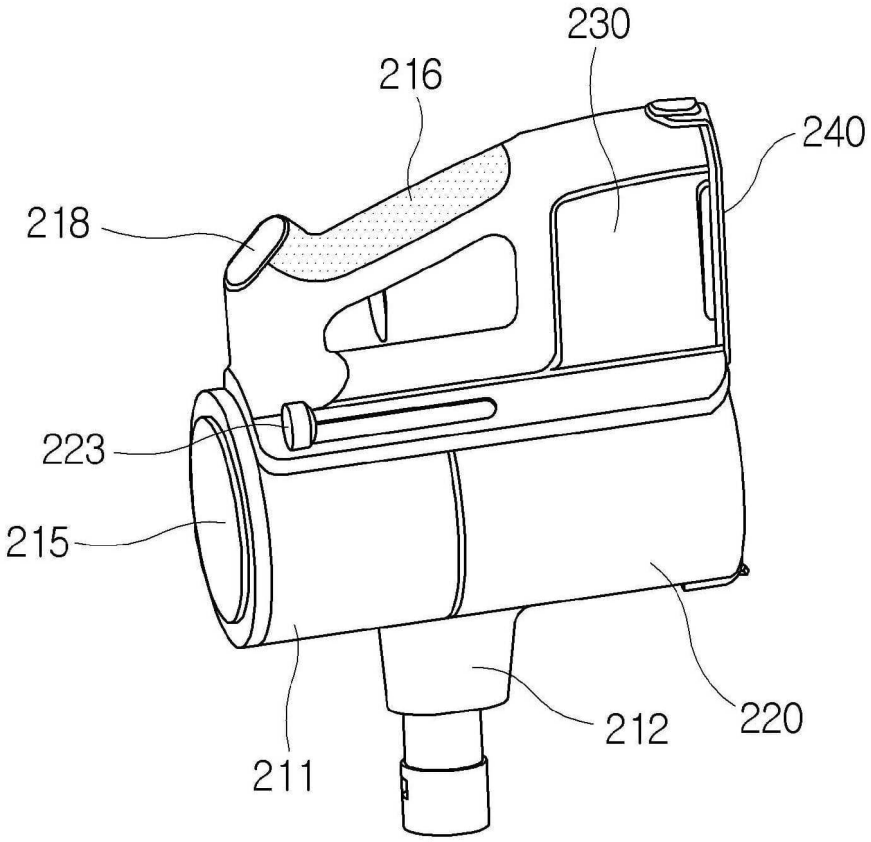
[FIG. 1]



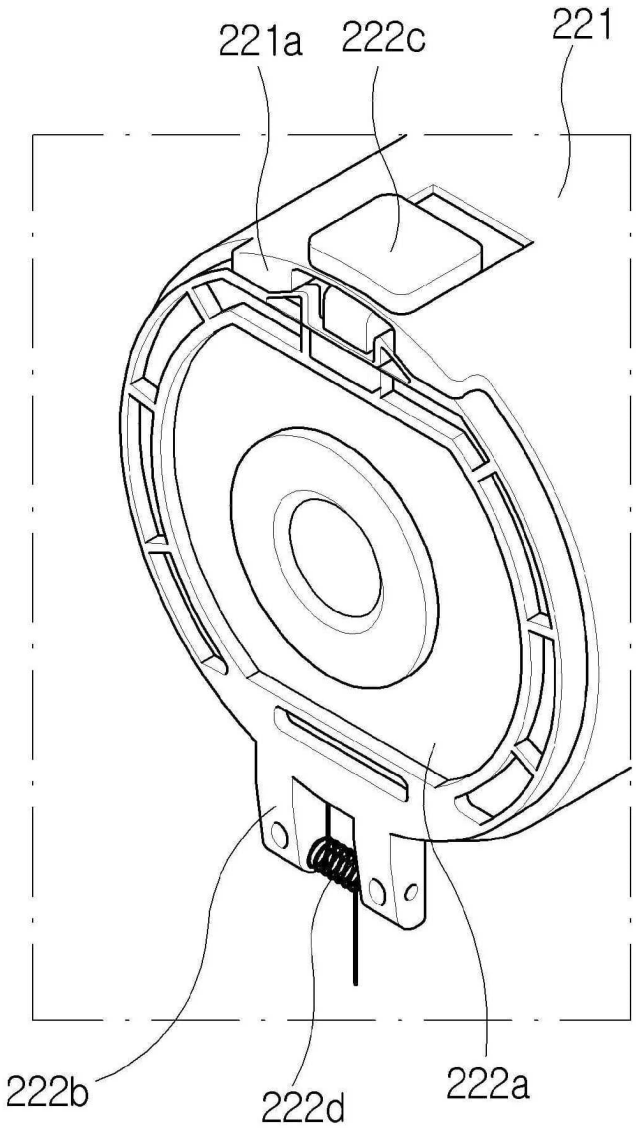
[FIG. 2]



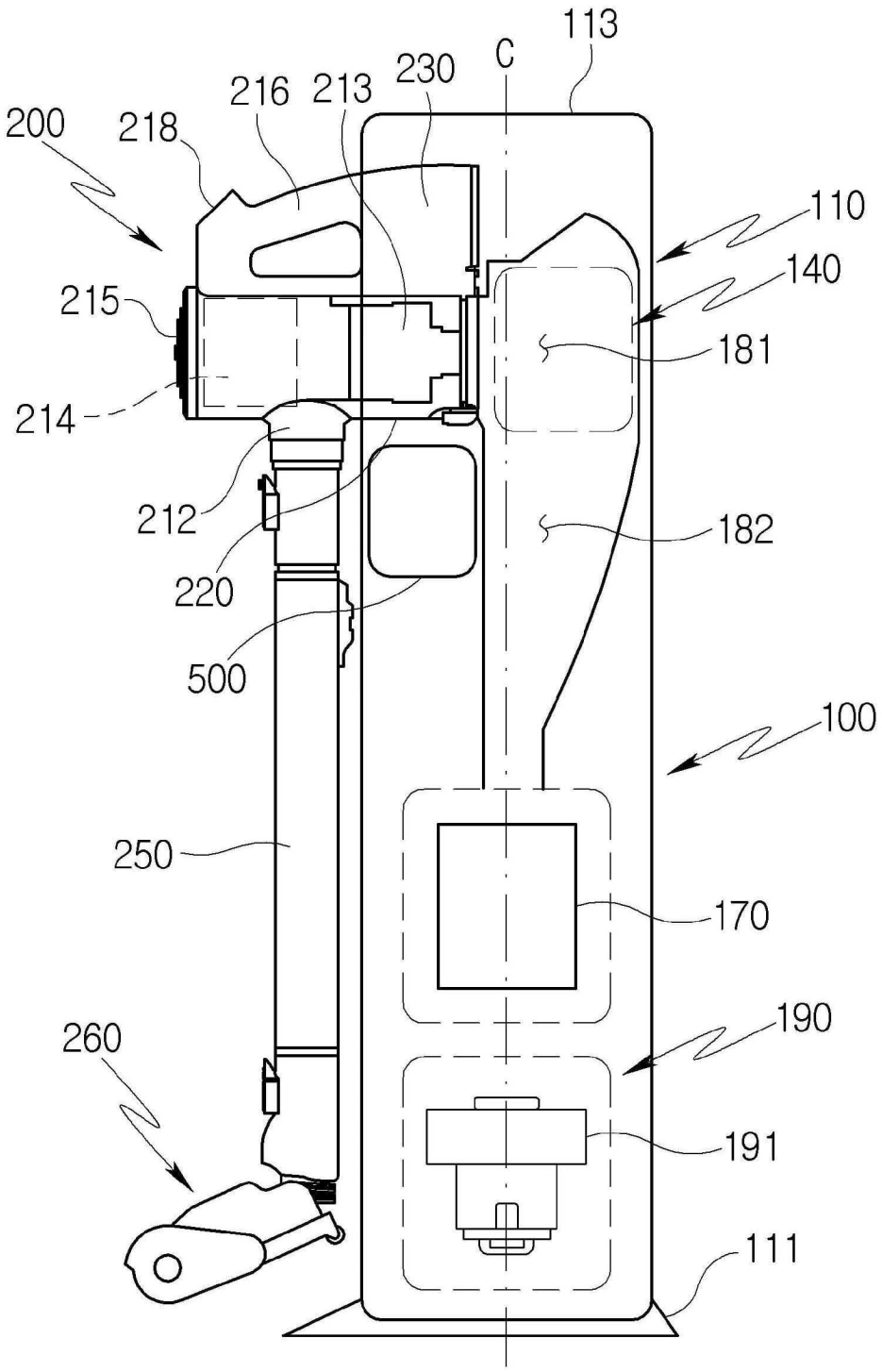
[FIG. 3]



[FIG. 4]



[FIG. 5]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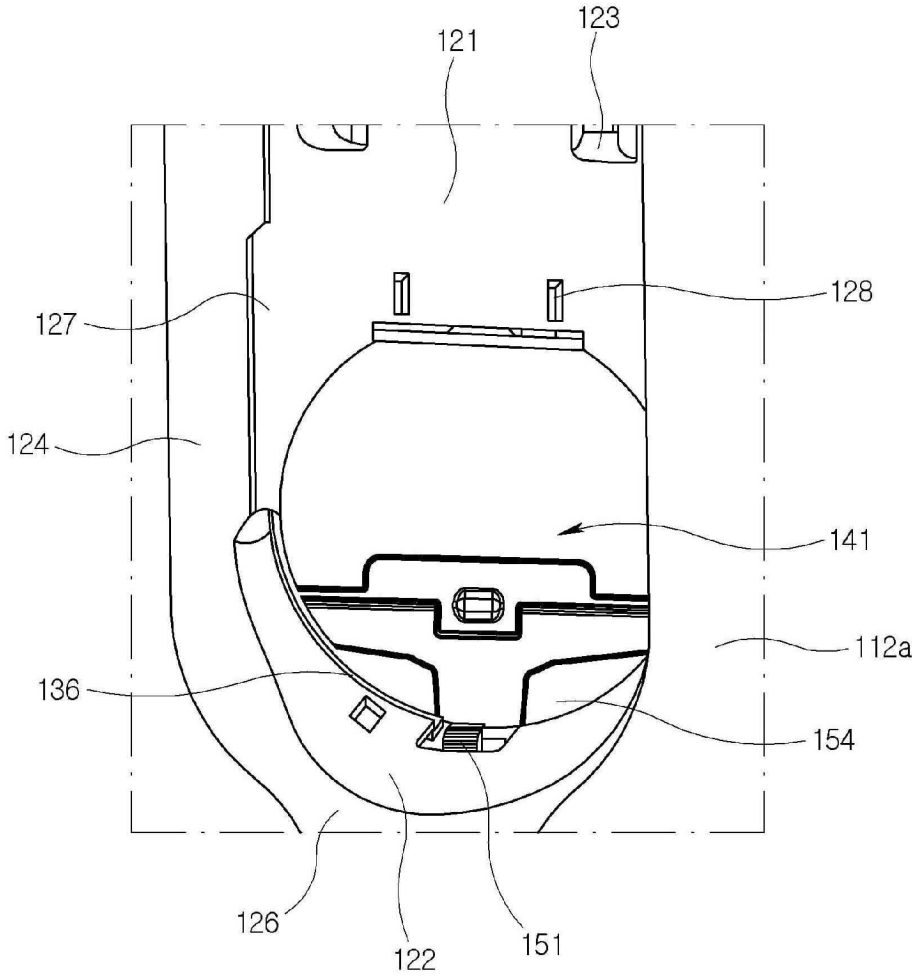
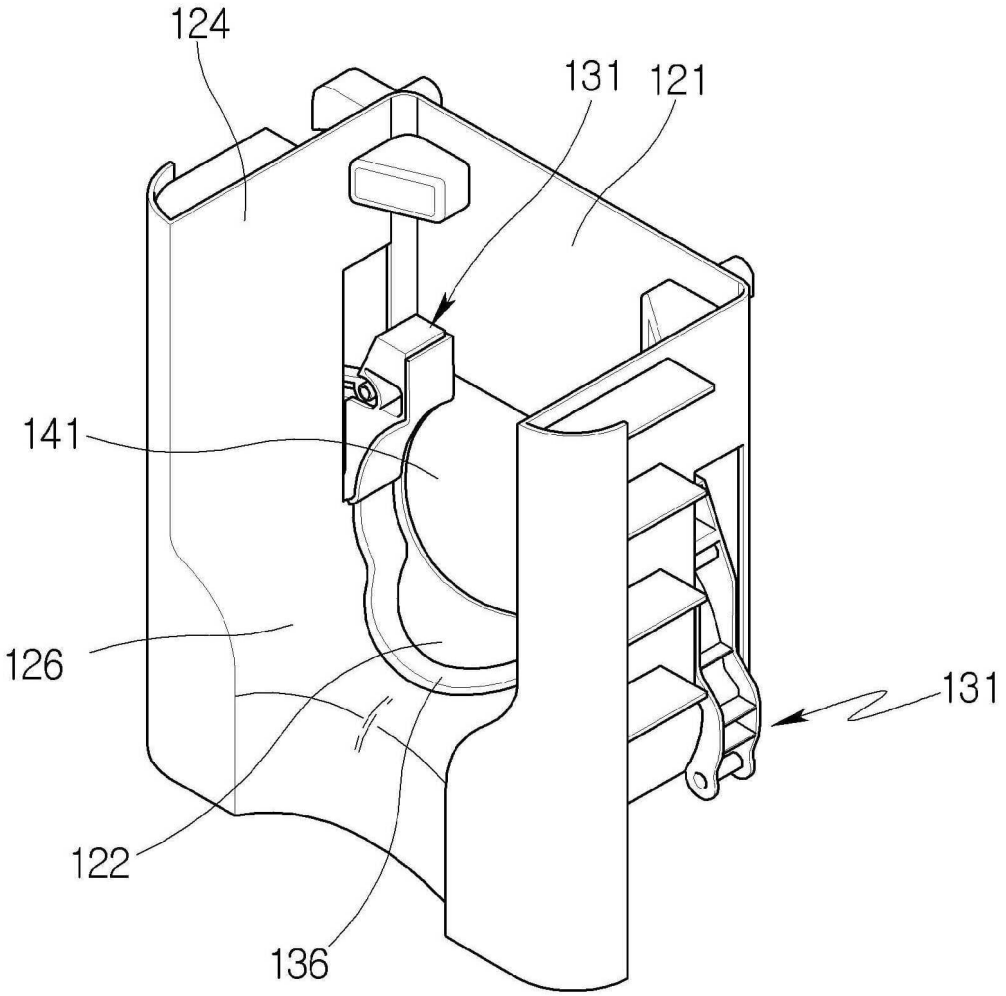
111

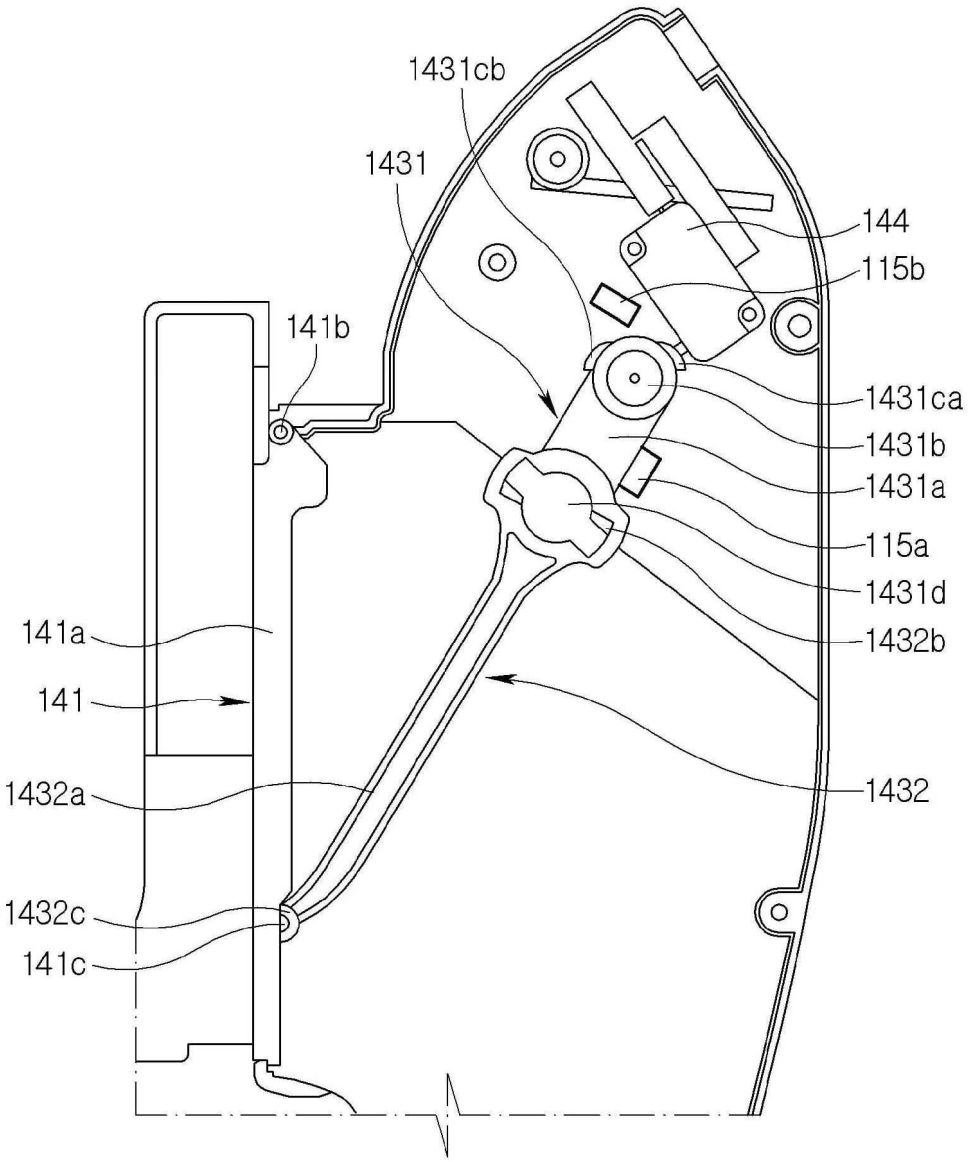
[FIG. 6]



[FIG. 7]



[FIG. 8]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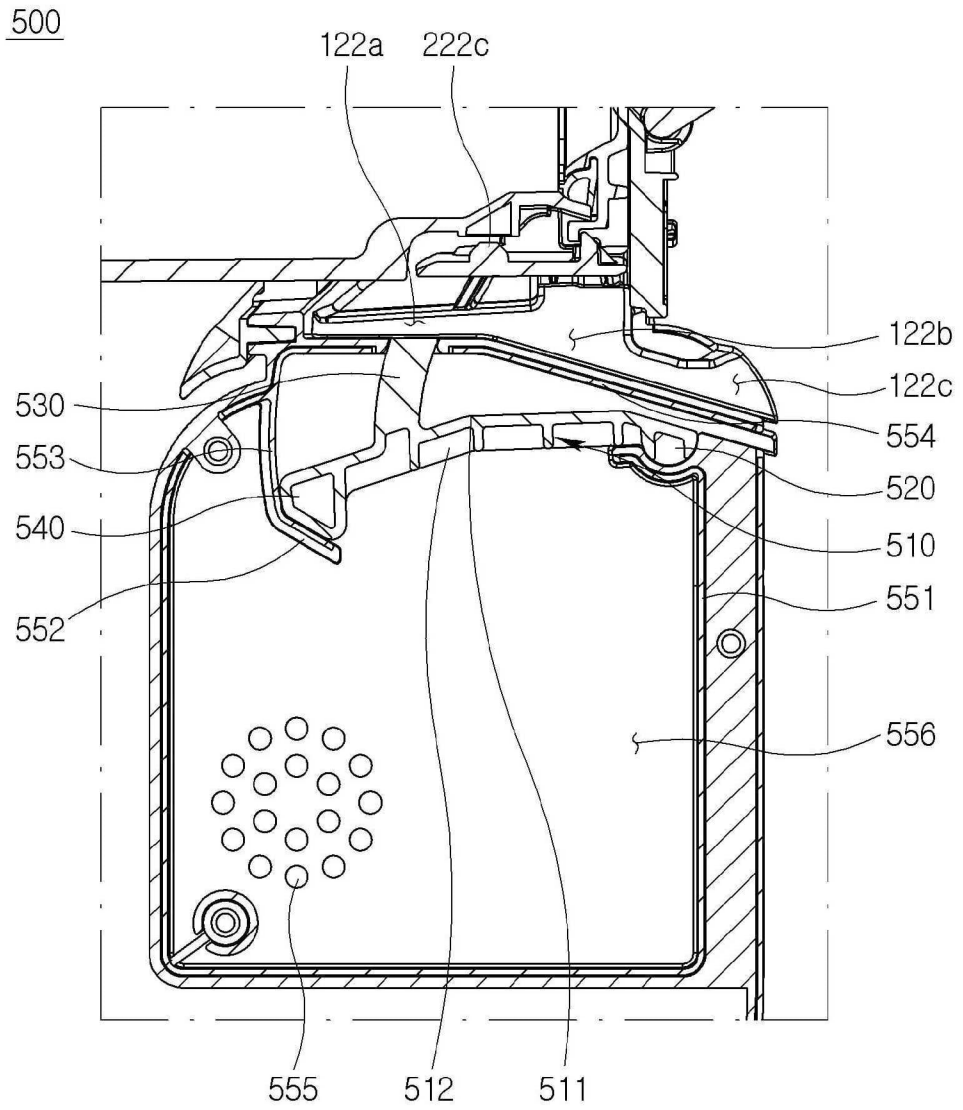
[FIG. 9]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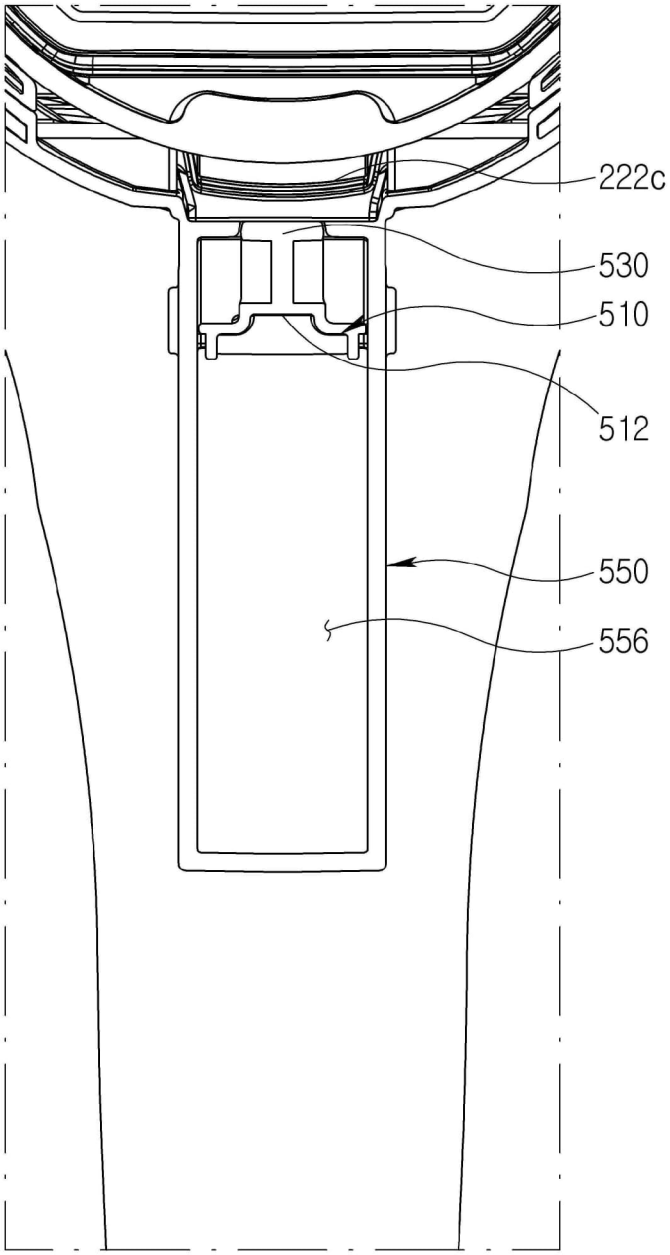
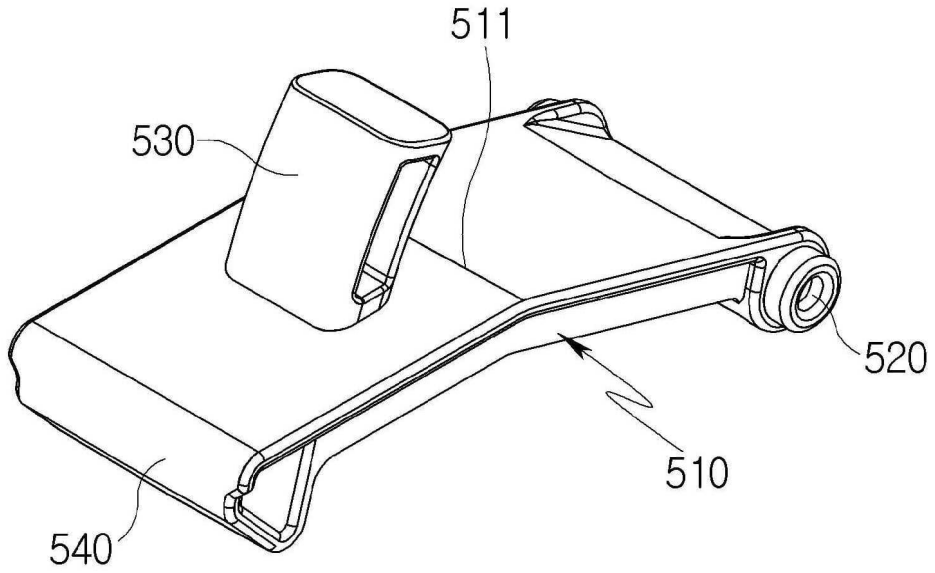
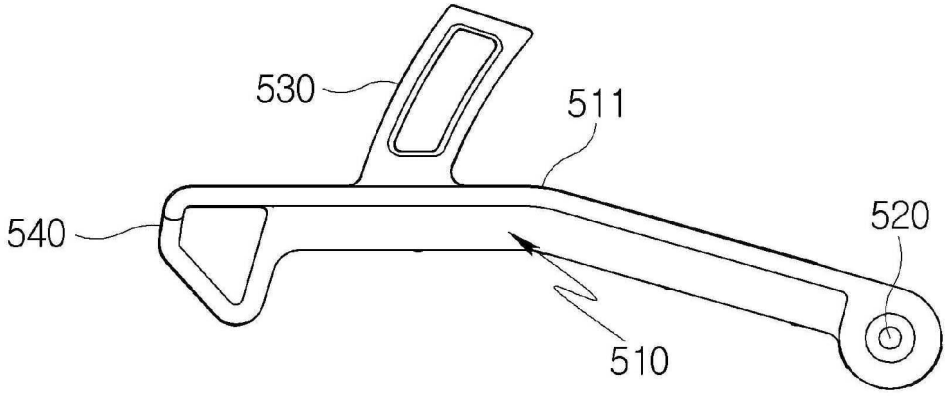
[FIG. 10]



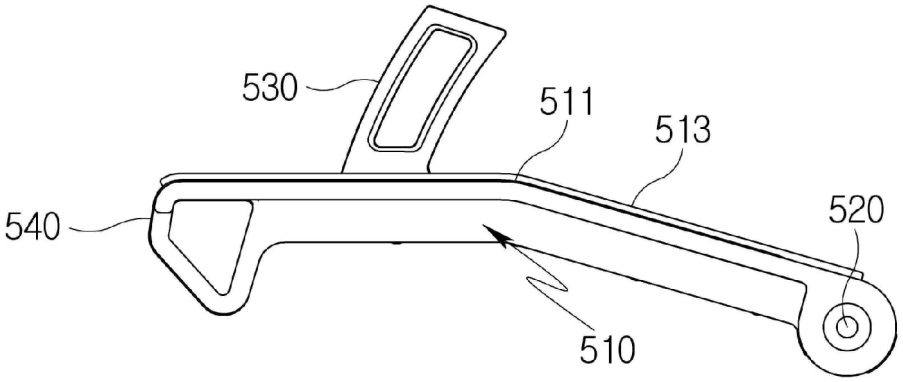
[FIG. 11]



[FIG. 12]



[FIG. 13]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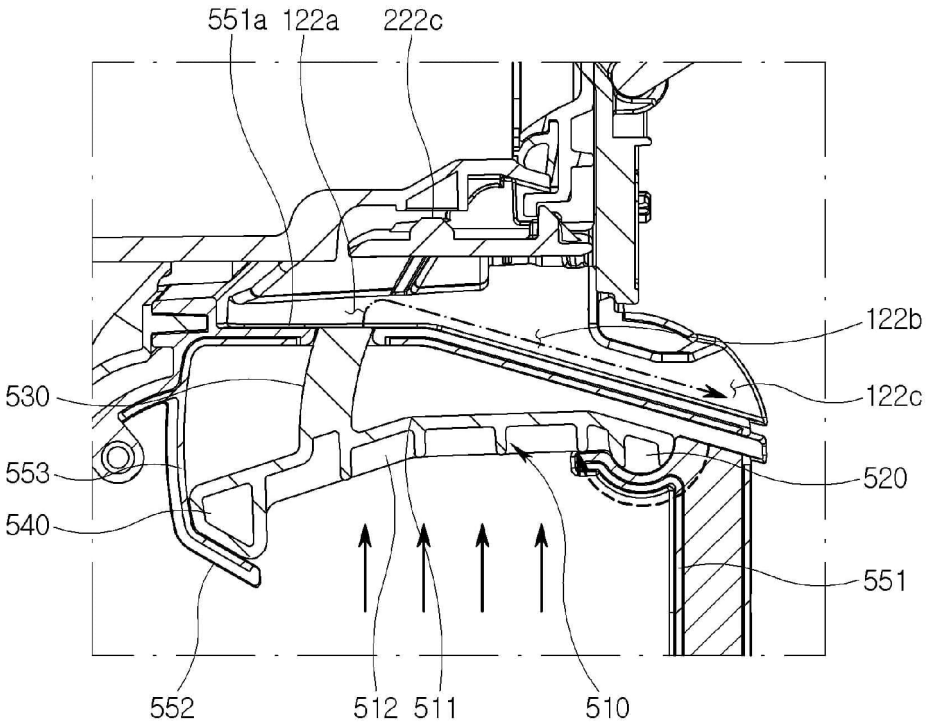
[FIG. 14]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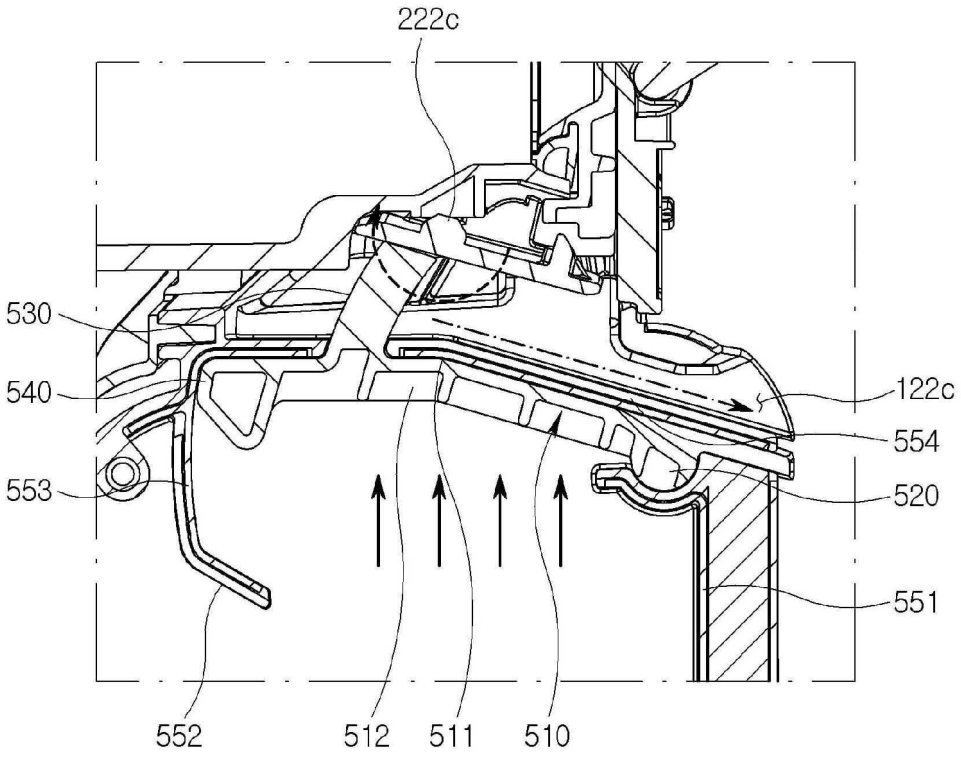
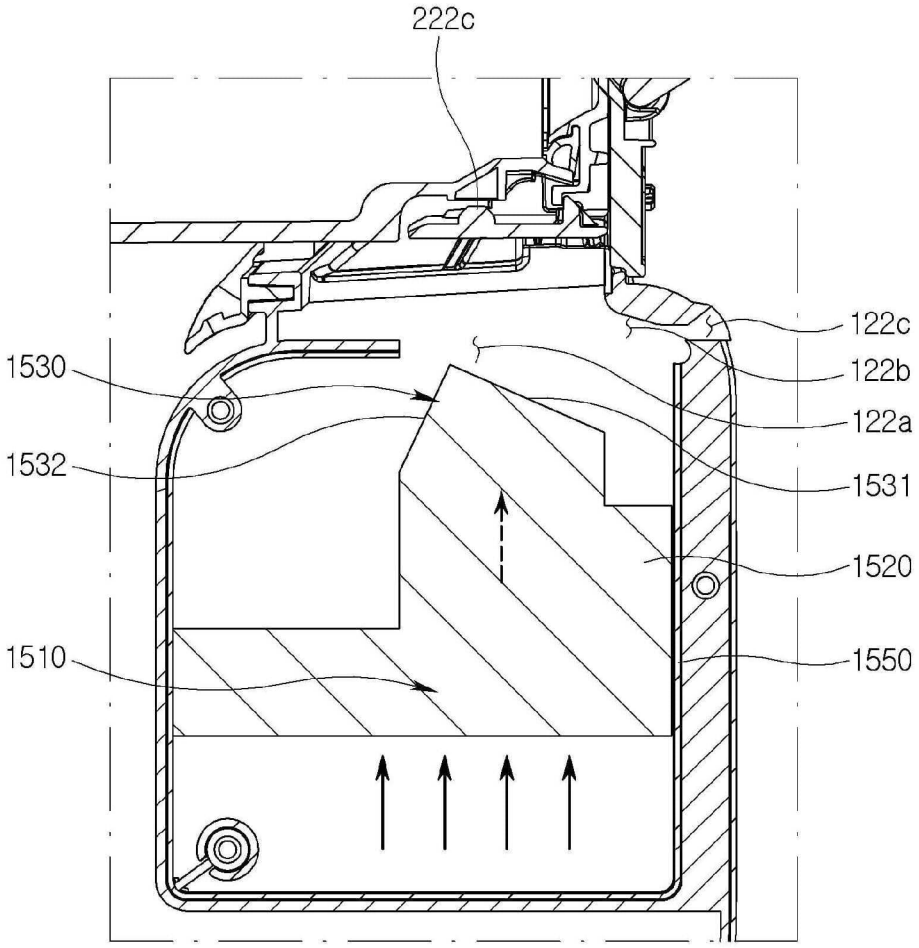
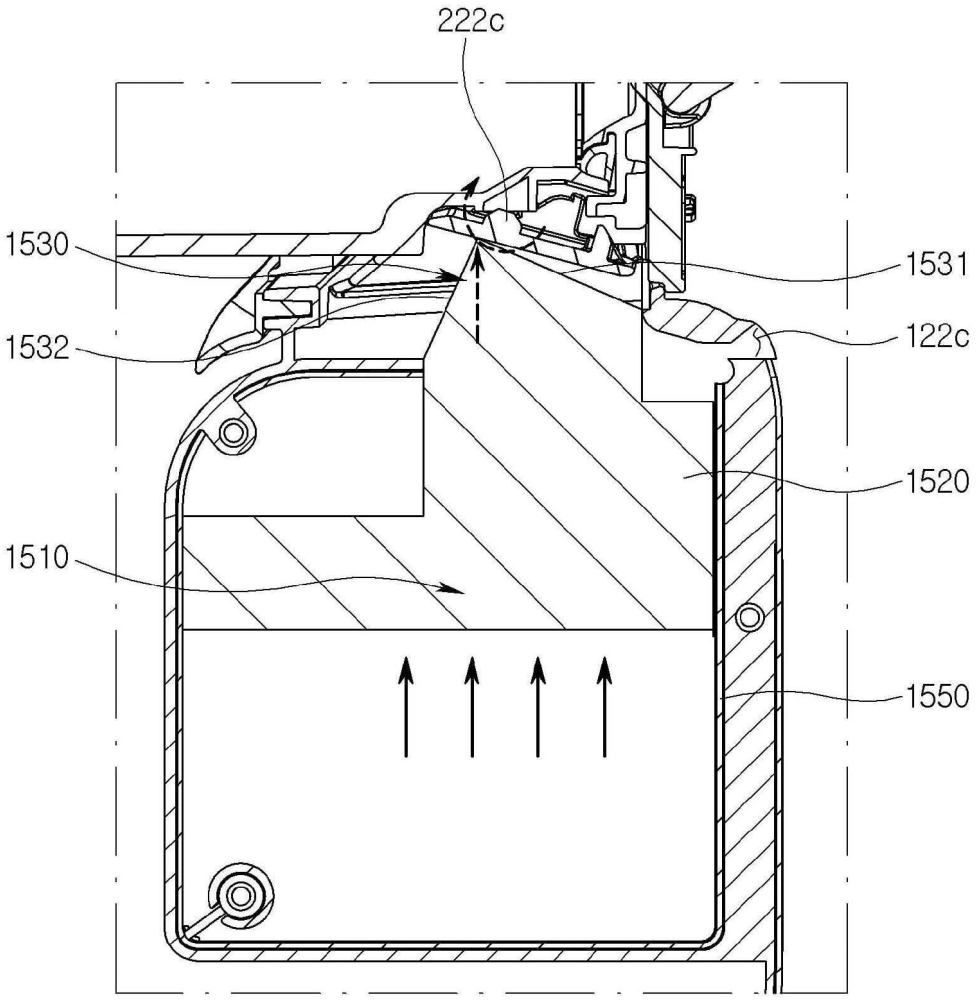
[FIG. 15]



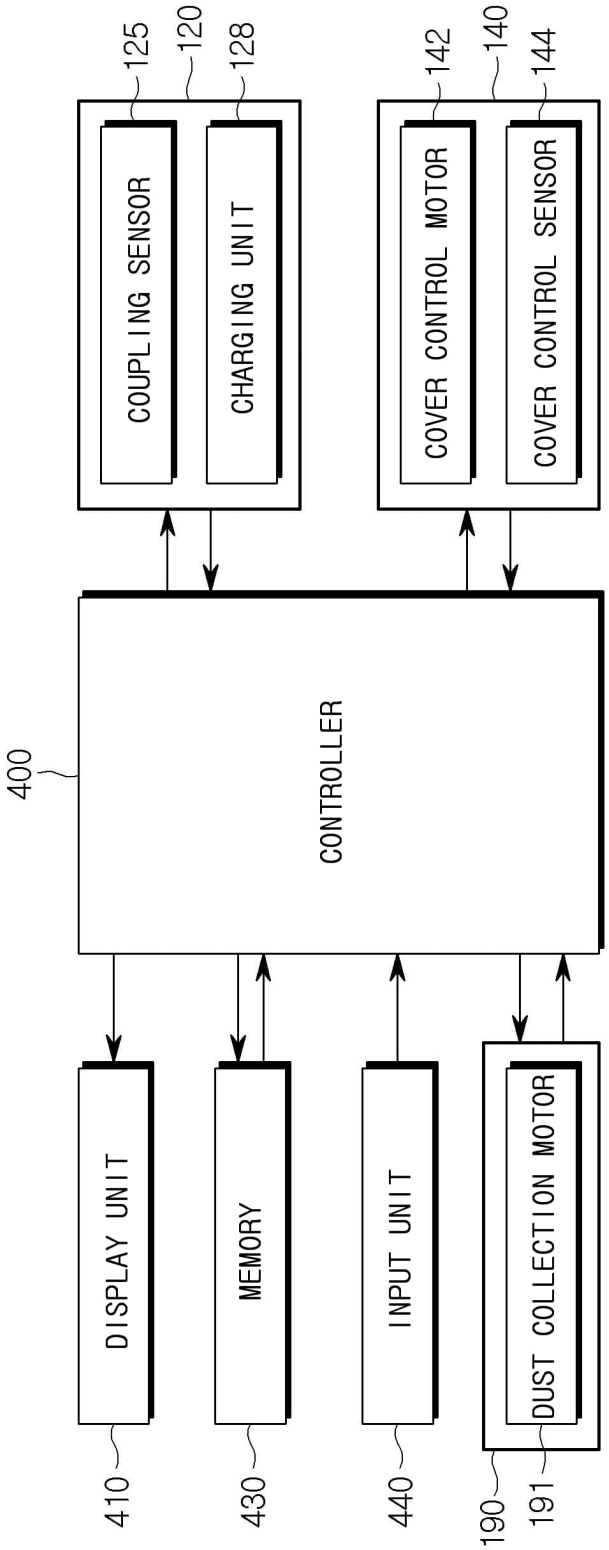
[FIG. 16]



[FIG. 17]



[FIG. 18]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COUPLING SENSOR
CHARGING UNIT
COVER CONTROL MOTOR
COVER CONTROL SENSOR
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CONTROLLER
DISPLAY UNIT
MEMORY
INPUT UNIT
DUST COLLECTION MOTOR
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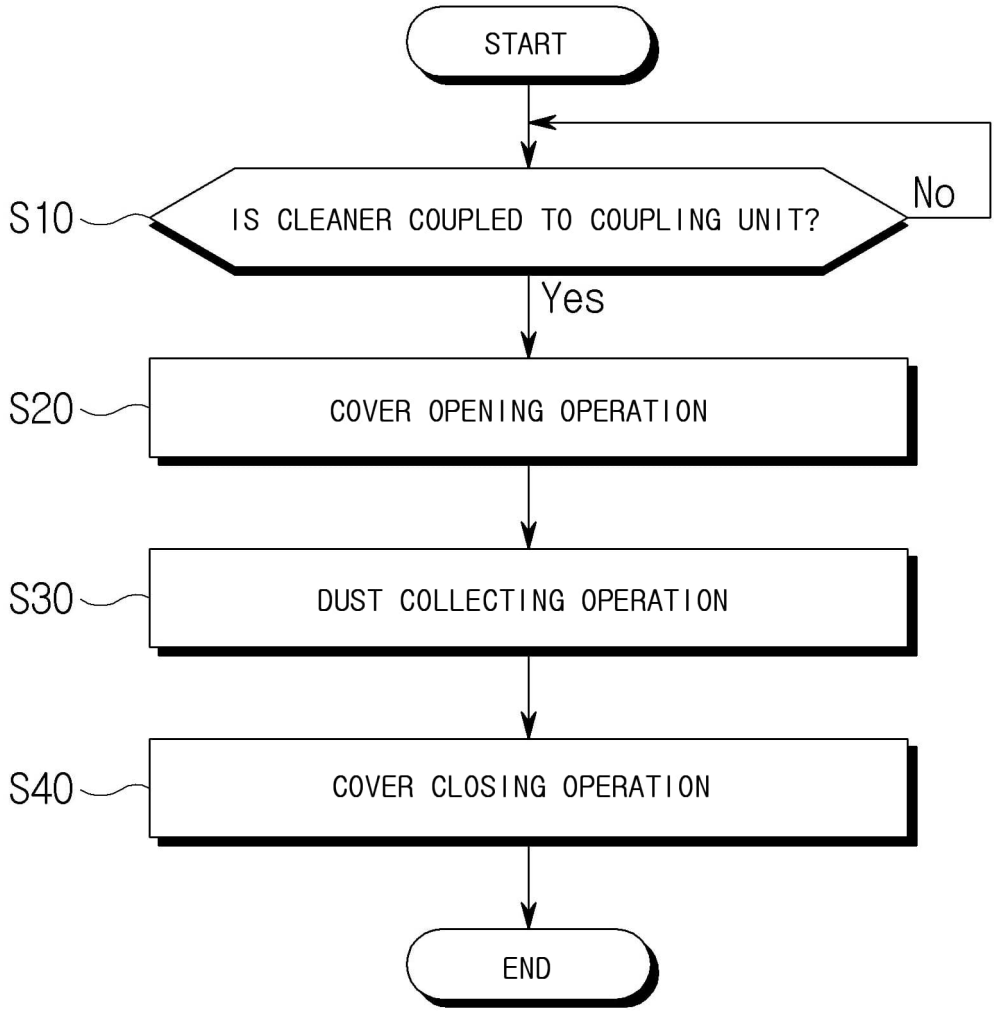
[FIG. 19]


START
S10
IS CLEANER COUPLED TO COUPLING UNIT?
No
Yes
S20
COVER OPENING OPERATION
S30
DUST COLLECTING OPERATION
S40
COVER CLOSING OPERATION
END

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2024/014724

A. CLASSIFICATION OF SUBJECT MATTER

A47L 9/28(2006.01)i; **A47L 9/00**(2006.01)i; **A47L 7/00**(2006.01)i; **A47L 9/16**(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); A47L 9/10(2006.01)

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

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

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

eKOMPASS (KIPO internal) & keywords: 청소기(vacuum cleaner), 스테이션(station), 커버(cover), 도어(door), 개방(open), 흡입력(suction power), 모터(motor), 압력(pressure), 경사(incline), 에어 덕트(air duct), 바이패스(bypass)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2023-0121703 A (SAMSUNG ELECTRONICS CO., LTD.) 21 August 2023 (2023-08-21) See paragraphs [0037]-[0076], [0102], [0128] and [0161]-[0191] and figures 1-11.	1-18
Y	US 2021-0330156 A1 (OMACHRON INTELLECTUAL PROPERTY INC.) 28 October 2021 (2021-10-28) See paragraphs [0264]-[0266] and [0305]-[0311] and figures 14A-14B.	1-18
Y	KR 10-2023-0040552 A (LG ELECTRONICS INC.) 23 March 2023 (2023-03-23) See paragraphs [0176]-[0228] and figures 2 and 9.	13-14,17
A	KR 10-2021-0032482 A (SHARKNINJA OPERATING LLC) 24 March 2021 (2021-03-24) See paragraphs [0069]-[0070] and figure 11.	1-18
A	KR 10-2023-0022476 A (SAMSUNG ELECTRONICS CO., LTD.) 16 February 2023 (2023-02-16) See paragraphs [0084]-[0135] and figures 9-21.	1-18

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

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

Date of the actual completion of the international search	Date of mailing of the international search report
03 January 2025	**03 January 2025**
Name and mailing address of the ISA/KR **Korean Intellectual Property Office** **Government Complex-Daejeon Building 4, 189 Cheongsa-ro, Seo-gu, Daejeon 35208** Facsimile No. **+82-42-481-8578**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2024/014724

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KR 10-2023-0022476 A	16 February 2023	EP 4327710 A1	28 February 2024
		US 2024-0081592 A1	14 March 2024
		WO 2023-018048 A1	16 February 2023

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REFERENCES CITED IN THE DESCRIPTION

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- KR 1020200074001 **[0012]**
- KR 1020210019940 **[0016]**