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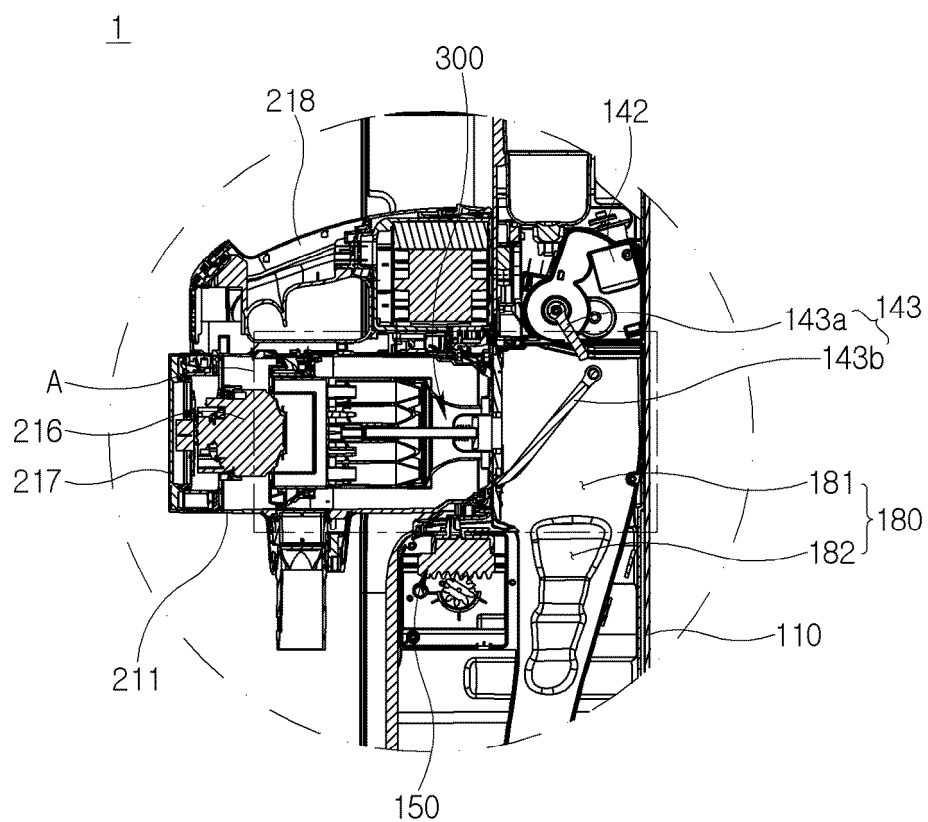
(54) **CLEANER SYSTEM**

(57) The present disclosure relates to a cleaner system and provides a cleaner system including a cleaner including a dust bin, and a suction part configured to guide external air including dust to an inside of the dust bin, and a cleaner station including a housing in which a coupling part to which the cleaner is coupled is disposed, a dust collection part configured to collect dust inside the dust bin, a flow path part configured to connect a dust bin through hole formed in the coupling part to the dust collection part, and a dust suction module configured to generate a suction airflow so that the dust inside the dust bin is suctioned into the dust collection part through the flow path part, wherein the cleaner may include a first

cyclone part configured to separate dust from air introduced from the suction part, a second cyclone part configured to separate dust from air passing through the first cyclone part, a storage member configured to partition a space inside the dust bin into a first dust storage part in which the dust separated from the first cyclone part is stored, and a second dust storage part in which the dust separated from the second cyclone part is stored, and an opening and closing unit moved in a longitudinal direction of the dust bin and selectively opening and closing the second dust storage part depending on whether the suction airflow is generated.

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FIG. 9



Description

[Technical Field]

[0001] The present disclosure relates to a cleaner system.

[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 dust bin 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 providing a dust bin 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 area. Therefore, 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. Therefore, it is advantageous for cleaning a wide region while moving. While the hand vacuum cleaner cleans narrow spaces, the stick-type vacuum cleaner may clean wider spaces and clean high places out of reach. Recently, the stick-type vacuum cleaner has been provided in a module type to allow users to actively change a vacuum cleaner type for various purposes.

[0008] Recent vacuum cleaners tend to be miniaturized to maximize portability. Therefore, recently produced vacuum cleaners have a small capacity of a dust bin, causing the user's inconvenience having to empty the dust bin frequently.

[0009] A vacuum cleaner station has been developed to solve the above-described inconvenience. The vacuum cleaner station is a device for holding the vacuum cleaner finishing cleaning and suctioning dust collected by the vacuum cleaner. That is, the dust collected by the cleaner is continuously collected in a dust collection part of the cleaner station, and the user empties the dust

collection part of the cleaner station. Therefore, there is an advantage in that the number of times the user empties dust is drastically reduced compared to a case of emptying the dust bin of the vacuum cleaner every time.

[0010] Meanwhile, Korean Patent Application Laid-Open No. 10-2022-0115253 discloses a cleaning device including a vacuum cleaner and a docking station.

[0011] In the related art document, a filter capable of filtering ultrafine dust, etc. that is not filtered by a multi-cyclone inside a dust bin may be provided. However, since the filter is disposed inside a filter housing above the dust bin, there is a problem that it is difficult for a user to easily separate and clean the filter. That is, to allow the user to clean the filter, there is the inconvenience of having to separate the dust bin and then remove the filter from the filter housing.

[0012] Likewise, to allow the user to clean the multi-cyclone, there is the inconvenience of having to first open or separate the dust bin and then separate the multi-cyclone from the dust bin.

[0013] In this case, in the related art document, a flow rate change device may be provided. The flow rate change device is a component for selectively driving the amount of a suction airflow supplied to the dust bin so that a flow rate of air inside the dust bin is changed when a suction device of the docking station is driven. That is, the flow rate change device is configured to repeat supplying and blocking external air to the dust bin in a manner of providing air to the dust bin for a predetermined time and then blocking the supply of air for a predetermined time, thereby periodically changing the flow rate supplied to the inside of the dust bin.

[0014] However, in the related art document, since a separate flow rate change device is configured to change the flow rate supplied to the inside of the dust bin by repeatedly opening and closing a flow path between a collection part and the suction device, large dust accumulated inside the dust bin may be strongly suctioned, but there is the limitation to removing dust accumulated in the filter disposed above the dust bin and the multi-cyclone disposed inside the dust bin.

[Disclosure]

[Technical Problem]

[0015] The present disclosure has been made in efforts to solve the above problems and is directed to providing a cleaner system capable of easily removing dust accumulated in a filter and a second cyclone part without separating components of a cleaner.

[0016] In addition, the present disclosure is directed to providing a cleaner system capable of intensively transferring a suction airflow to a second dust storage part when a dust collection motor of a cleaner station is driven.

[0017] In addition, the present disclosure is directed to providing a cleaner system capable of airtightening a second dust storage part in a state in which a dust

collection motor of a cleaner station is not driven.

[0018] In addition, the present disclosure is directed to providing a cleaner system capable of suctioning dust accumulated in a filter and a second cyclone part by transferring a suction airflow generated from a dust collection motor of a cleaner station to the filter and the second cyclone part.

[0019] In addition, the present disclosure is directed to providing a cleaner system capable of uniformly transferring a suction airflow flowing into a second dust storage part.

[0020] In addition, the present disclosure is directed to providing a cleaner system in which a valve member for opening and closing a dust outlet is moved in a longitudinal direction of a dust bin so that all edge regions of the dust outlet communicate with a flow path part without interfering with a separate member.

[Technical Solution]

[0021] To achieve the objects, a cleaner system according to the present disclosure may include a cleaner including a dust bin, and a suction part configured to guide external air including dust to an inside of the dust bin, and a cleaner station including a housing in which a coupling part to which the cleaner is coupled is disposed, a dust collection part configured to collect dust inside the dust bin, a flow path part configured to connect a dust bin through hole formed in the coupling part to the dust collection part, and a dust suction module configured to generate a suction airflow so that the dust inside the dust bin is suctioned into the dust collection part through the flow path part, wherein the cleaner may include a first cyclone part configured to separate dust from air introduced from the suction part, a second cyclone part configured to separate dust from air passing through the first cyclone part, a storage member configured to partition a space inside the dust bin into a first dust storage part in which the dust separated from the first cyclone part is stored, and a second dust storage part in which the dust separated from the second cyclone part is stored, and an opening and closing unit moved in a longitudinal direction of the dust bin and selectively opening and closing the second dust storage part depending on whether the suction airflow is generated.

[0022] The opening and closing unit may include a guide member extending the longitudinal direction of the dust bin, a valve member disposed to move along the guide member and open the second dust storage part when the suction airflow is generated, and an elastic member connected to each of the guide member and the valve member and generating an elastic force in a direction the valve member closes the second dust storage part.

[0023] When the suction airflow is generated, the valve member may open a portion of a dust outlet formed on the storage member.

[0024] The dust bin may include a dust bin main body

having the first dust storage part and the second dust storage part disposed therein, and a discharge cover rotatably coupled to the dust bin main body to open and close the first dust storage part.

[0025] A cover hole through which the valve member passes when the suction airflow is generated may be formed in the discharge cover.

[0026] The cleaner system may include a door coupled to the housing to open and close the dust through hole, and a door hole through which the valve member passes when the suction airflow is generated may be formed in the door.

[0027] The dust suction module may generate the suction airflow in a state in which the discharge cover and the door are closed.

[0028] To achieve the objects, a cleaner system according to the present disclosure may include a cleaner including a dust bin, and a suction part configured to guide external air including dust to an inside of the dust bin, and a cleaner station including a housing in which a coupling part to which the cleaner is coupled is disposed, a dust collection part configured to collect dust inside the dust bin, a flow path part configured to connect a dust bin through hole formed in the coupling part to the dust collection part, and a dust suction module configured to generate a suction airflow so that the dust inside the dust bin is suctioned into the dust collection part through the flow path part, wherein the cleaner may include a first cyclone part configured to separate dust from air introduced from the suction part, a second cyclone part configured to separate dust from air passing through the first cyclone part, a storage member configured to partition a space inside the dust bin into a first dust storage part in which the dust separated from the first cyclone part is stored, and a second dust storage part in which the dust separated from the second cyclone part is stored, a filter configured to separate dust from air passing through the second cyclone part, and a cleaning unit configured to receive a rotational force from the cleaner station and clean the filter.

[0029] The cleaner station may include a door coupled to the housing to open and close the dust through hole, and a rotational unit disposed on the door and rotating the cleaning unit in a state in which the door is closed.

[0030] The cleaning unit may include a guide member having at least a portion rotatably disposed inside the dust bin and one side coupled to the rotational unit when the door is closed, and a cleaning member disposed at the other side of the guide member and rotating together with the guide member.

[0031] The cleaner may further include a dust bin longitudinal axis extending in the longitudinal direction of the dust bin, and the rotational unit may rotate about the dust bin longitudinal axis in the state in which the door is closed.

[0032] A door hole configured to guide dust in the second dust storage part to the flow path part when the suction airflow is generated in the state in which

the door is closed may be formed in the door.

[0033] The cleaner may further include a discharge flow path configured to allow the second dust storage part to communicate with the door hole.

[0034] The rotational unit may include a rotor having at least a portion disposed in front of the door and coupled to the cleaning unit, and a driving motor disposed behind the door and providing a rotational force to the rotor.

[0035] The dust suction module may generate the suction airflow after the driving motor is driven.

[0036] The dust bin may include a dust bin main body having the first dust storage part and the second dust storage part disposed therein, and a discharge cover rotatably coupled to the dust bin main body to open and close the first dust storage part.

[0037] The dust suction module may generate the suction airflow in a state in which the discharge cover and the door are closed.

[0038] The cleaner station may include a door coupled to the housing to open and close the dust through hole, and a rotational unit disposed inside the housing and rotating the cleaning unit in a state in which the door is opened.

[0039] The rotational unit may include a hinge member rotatable installed inside the housing, a rotor disposed on the hinge member and coupled to the cleaning unit when the hinge member rotates toward the dust through hole, and a driving motor configured to provide a rotational force to the rotor.

[0040] To achieve the objects, a cleaner according to the present disclosure may include a dust bin, a suction part configured to guide external air including dust to an inside of the dust bin, a first cyclone part configured to separate dust from air introduced from the suction part, a second cyclone part configured to separate dust from air passing through the first cyclone part, a storage member configured to partition a space inside the dust bin into a first dust storage part in which the dust separated from the first cyclone part is stored, and a second dust storage part in which the dust separated from the second cyclone part is stored, a guide member having at least a portion disposed inside the dust bin, a valve member disposed to move along the guide member to open and close the second dust storage part, and an elastic member connected to each of the guide member and the valve member and generating an elastic force in a direction the valve member closes the second dust storage part.

[0041] To achieve the objects, a cleaner according to the present disclosure may include a dust bin, a suction part configured to guide external air including dust to an inside of the dust bin, a first cyclone part configured to separate dust from air introduced from the suction part, a second cyclone part configured to separate dust from air passing through the first cyclone part, a storage member configured to partition a space inside the dust bin into a first dust storage part in which the dust separated from the first cyclone part is stored, and a second dust storage part in which the dust separated from the second cyclone

part is stored, a filter configured to separate dust from air passing through the second cyclone part, a guide member having at least a portion rotatably disposed inside the dust bin, and a cleaning member disposed at one side of the guide member and cleaning the filter while rotating together with the guide member.

[0042] To achieve the objects, a cleaner system according to the present disclosure may include a cleaner including a dust bin, a suction part configured to guide external air including dust to an inside of the dust bin, and a suction motor configured to provide a suction airflow to the suction part, a cleaner station including a housing in which a coupling part to which the cleaner is coupled is disposed, a dust collection part configured to collect dust inside the dust bin, a flow path part configured to connect a dust bin through hole formed in the coupling part to the dust collection part, and a dust suction module configured to generate a suction airflow so that the dust inside the dust bin is suctioned into the dust collection part through the flow path part, and a virtual suction motor axis line extending a rotational axis of the suction motor, wherein the cleaner may include a first cyclone part configured to separate dust from air introduced from the suction part, a second cyclone part configured to separate dust from air passing through the first cyclone part, a storage member configured to partition a space inside the dust bin into a first dust storage part in which the dust separated from the first cyclone part is stored, and a second dust storage part in which the dust separated from the second cyclone part is stored, a filter configured to separate dust from air passing through the second cyclone part, and an opening and closing unit moved in a longitudinal direction of the dust bin and selectively opening and closing the second dust storage part depending on whether the suction airflow is generated, and the filter and the second cyclone part may be disposed in a vertical direction along the suction motor axis line.

[Advantageous Effects]

[0043] As described above, according to the cleaner system according to the present disclosure, the hygienic state inside the cleaner can be kept clean without separating the components of the cleaner by allowing the suction airflow to be intensively transferred to the filter and the second cyclone part of the cleaner.

[0044] In addition, according to the present disclosure, it is possible to effectively remove the dust accumulated inside the filter and the second cyclone part by transferring the suction airflow only to the second dust storage part in the state in which the first dust storage part is closed.

[0045] In addition, according to the present disclosure, since the valve member receives the elastic force in the direction of closing the second dust storage part, it is possible to airtighten the second dust storage part when the dust collection motor is not driven.

[0046] In addition, according to the present disclosure,

it is possible to remove the dust accumulated in the filter of the cleaner by allowing the rotational unit disposed on the door to rotate the cleaning member in the state in which the door is closed.

[0047] In addition, according to the present disclosure, it is possible to remove the dust accumulated in the filter of the cleaner by allowing the rotational unit disposed inside the housing to rotate the cleaning member in the state in which the door is opened.

[0048] In addition, according to the present disclosure, since only a portion of the outlet of the storage member is first opened, it is possible to increase the suction airflow transferred to the second dust storage part when compared to the case where the dust outlet is fully opened.

[0049] In addition, according to the present disclosure, it is possible to uniformly transfer the suction airflow generated from the dust suction module to the second dust storage part.

[0050] In addition, according to the present disclosure, since the valve member for opening and closing the dust outlet is moved in the longitudinal direction of the dust bin, all edge regions of the dust outlet can communicate with the flow path part without interfering with the separate member.

BRIEF DESCRIPTION OF THE DRAWINGS

[0051]

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 disclosure.

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

FIGS. 3 and 4 are views for describing a cleaner of the cleaner system according to the embodiment of the present disclosure.

FIG. 5 is an exploded view of the cleaner according to the embodiment of the present disclosure.

FIG. 6 is a view for describing the relationship between the cleaner and a door unit in the cleaner system according to the embodiment of the present disclosure.

FIG. 7 is a view for describing the relationship between the cleaner and a cover opening unit in the cleaner system according to the embodiment of the present disclosure.

FIG. 8 is a block diagram for describing a control configuration of the cleaner system according to the embodiment of the present disclosure.

FIG. 9 is a side cross-sectional view of a cleaner system according to a first embodiment of the present disclosure.

FIG. 10A is an enlarged view for specifically describing region A shown in FIG. 9.

FIG. 10B is a view for describing an opened state of a second dust storage part shown in FIG. 10A.

FIG. 11 is a perspective view for describing a lower surface of a dust bin of the cleaner according to the first embodiment of the present disclosure.

FIG. 12A is a side cross-sectional view for specifically describing an opening and closing unit of the cleaner according to the first embodiment of the present disclosure.

FIG. 12B is a side cross-sectional view showing an opened state of the second dust storage part shown in FIG. 12A.

FIG. 13 is a perspective view for describing a door of a cleaner station according to the first embodiment of the present disclosure.

FIG. 14 is a side cross-sectional view for describing a cleaner system according to a second embodiment of the present disclosure.

FIG. 15A is an enlarged view for specifically describing region B shown in FIG. 14.

FIG. 15B is a view for describing an opened state of a second dust storage part shown in FIG. 15A.

FIG. 16 is a perspective view for describing a lower surface of a dust bin of the cleaner according to the second embodiment of the present disclosure.

FIG. 17 is a side cross-sectional view for describing a detailed configuration of the cleaner according to the second embodiment of the present disclosure.

FIG. 18 is a perspective view for describing a detailed configuration of an opening and closing unit according to the second embodiment of the present disclosure.

FIG. 19 is a perspective view for describing a door of a cleaner station according to the second embodiment of the present disclosure.

FIG. 20 is a side cross-sectional view showing opened states of the door and a discharge cover in the cleaner system according to the second embodiment of the present disclosure.

FIG. 21 is a side cross-sectional view of a cleaner system according to a third embodiment of the present disclosure.

FIG. 22A is an enlarged view for specifically describing region C shown in FIG. 21.

FIG. 22B is a view for describing an opened state of a second dust storage part shown in FIG. 22A.

DETAILED DESCRIPTION OF THE INVENTION

[0052] Hereinafter, exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawings.

[0053] Since the present disclosure may have various changes and various embodiments, specific embodiments are shown in the accompanying drawings and specifically described in the detail descriptions. This is not intended to limit the present disclosure to specific embodiments and should be construed to include all modifications, equivalents, and substitutes included in the spirit and technical scope of the present disclosure.

[0054] The terms used in the present application are only used to describe specific embodiments and are not intended to limit the present disclosure. The singular expression includes the plural expression unless the context clearly dictates otherwise.

[0055] 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 disclosure 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.

[0056] FIG. 1 shows a perspective view of a cleaner system composed of a cleaner station and a cleaner according to an embodiment of the present disclosure, and FIGS. 2 to 4 show schematic views of configurations of cleaner systems according to various embodiments of the present disclosure.

[0057] Referring to FIGS. 1 and 2, a cleaner system 10 according to an embodiment of the present disclosure may include a cleaner station 100 and a cleaner 200.

[0058] The cleaner system 10 may include a cleaner station 100. A 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 dust bin 220 of the cleaner 200.

[0059] Meanwhile, FIG. 5 shows an exploded view of the cleaner according to the embodiment of the present disclosure.

[0060] A structure of the cleaner 200 will be described with reference to FIG. 5 as follows.

[0061] The cleaner 200 may be a cleaner that is manually manipulated by a user. For example, the cleaner 200 may be a hand cleaner or a stick-type cleaner.

[0062] The cleaner 200 may be held 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.

[0063] Meanwhile, in one embodiment of the present disclosure, a direction of the cleaner 200 can be defined based on when bottom surfaces (lower surfaces) of the dust bin 220 and a battery housing 230 are placed on the ground.

[0064] In this case, the front may refer to a direction in which a suction part 212 is disposed with respect to the suction motor 216, and the rear may refer to a direction in which a handle 218 is disposed with respect to the suction motor 216. In addition, a direction located at the right may be referred to as a right side, and a direction located at the left may be referred to as a left side with respect to when viewing the suction part 212 from the suction motor 216. In addition, in one embodiment of the present disclosure, upper and lower sides can be defined in a direction perpendicular to the ground with respect to when the bottom surfaces (lower surfaces) of the dust bin 220 and

the battery housing 230 are placed on the ground.

[0065] The cleaner 200 may include a main body 210. The main body 210 may include a main body housing 211, a suction part 212, a cyclone part 213, a filter part 214, storage members 215 and 1215, a suction motor 216, an air discharge cover 217, a handle 218, and a manipulation part 219.

[0066] The main body housing 211 may form the appearance of the cleaner 200. The main body housing 211 may provide a space in which the suction motor 216 and a filter 270 may be accommodated therein. The main body housing 211 may be configured in a shape similar to a cylinder.

[0067] The suction part 212 may protrude outward from the main body housing 211. As an example, the suction part 212 may be formed in a cylindrical shape with an open interior. The suction part 212 may be coupled to an extension pipe 250. The suction part 212 may provide a flow path through which air including dust may flow (hereinafter referred to as "suction flow path").

[0068] Meanwhile, in the present embodiment, a virtual line passing through the inside of the suction part 212 configured in a cylindrical shape may be formed. The virtual line passing through the inside of the suction part 212 may refer to a longitudinal axis a1 of the suction flow path.

[0069] The cyclone part 213 is a component that adopts the principle of a dust collector that uses a centrifugal force to separate dust suctioned into the inside of the dust bin 220 through the suction part 212. At least one cyclone part 213 may be provided to separate dust by a cyclonic flow.

[0070] The cyclone part 213 may include a first cyclone part 213a disposed inside the dust bin 220 and a second cyclone part 213b disposed inside the first cyclone part 213a.

[0071] The first cyclone part 213a may communicate with the suction part 212. The first cyclone part 213a is a component that adopts the principle of the dust collector that uses the centrifugal force to separate dust suctioned into the dust bin 220 through the suction part 212.

[0072] The first cyclone part 213a may refer to a space in which a cyclonic flow circulating along an inner circumferential surface of the dust bin 220 is generated. The first cyclone part 213a may refer to a partial region of the space inside the dust bin 220.

[0073] The air and dust suctioned through the suction part 212 may flow along the inner circumferential surface of the first cyclone part 213a, and thus a cyclonic flow may be generated from an internal space of the cyclone part 213.

[0074] The cyclonic flow generated from the first cyclone part 213a may be generated by the suction force of the suction motor 216. The cyclonic flow generated from the first cyclone part 213a may be formed between the inside of the dust bin 220 and the outside of a filter body 214a. The cyclonic flow generated from the first cyclone part 213a may be formed between an inner circumfer-

ential surface of the cyclone part 213 and an outer circumferential surface of the filter body 214a.

[0075] In this case, an axis a2 of the cyclonic flow generated from the first cyclone part 213a and the axis a2 of the cyclonic flow generated from the second cyclone part 213b may extend in a vertical direction. That is, the axis a2 of the cyclonic flow generated from the first cyclone part 213a and the axis a2 of the cyclonic flow generated from the second cyclone part 213b may form a coaxial axis in the vertical direction, which may be collectively referred to as the axis a2 of the cyclonic flow of the cyclone part 213.

[0076] As an example, the cyclonic flow generated from the first cyclone part 213a may be formed to surround an inner circumference of the dust bin 220 or an outer circumference of the filter body 214a to be described below in a circular shape. That is, the air suctioned through the suction part 212 may flow in a circular shape along the inner circumference of the dust bin 220 or the outer circumference of the filter body 214a with respect to a dust bin central axis a3, and thus the cyclonic flow may be generated from the internal space of the cyclone part 213.

[0077] Specifically, when the axis a2 of the cyclonic flow is disposed perpendicular to a lower side in a direction of gravity, the air suctioned through the suction part 212 may flow in a circular shape along the inner circumference of the dust bin 220 or an inner circumference of the filter body 214a. That is, when the axis a2 of the cyclonic flow is disposed parallel to the ground, the air suctioned through the suction part 212 may flow in a circular shape along the inner circumference of the dust bin 220 or the inner circumference of the filter body 214a with respect to the dust bin central axis a3.

[0078] As another example, the cyclonic flow generated from the first cyclone part 213a may be formed in a spiral shape along the inner circumference of the dust bin 220 or the outer circumference of the filter body 214a. That is, the air suctioned through the suction part 212 may flow spirally along the inner circumference of the dust bin 220 or the outer circumference of the filter body 214a, and thus the cyclonic flow may be generated from the internal space of the first cyclone part 213a.

[0079] Specifically, when the axis a2 of the cyclonic flow is disposed to be tilted with respect to the ground, the air suctioned through the suction part 212 may flow in a spiral form along the inner circumference of the dust bin 220 or the outer circumference of the filter body 214a.

[0080] Meanwhile, the cyclone part 213 may include a second cyclone part 213b for separating dust from the air passing through the first cyclone part 213a. Specifically, the second cyclone part 213b may re-separate dust from the air discharged from the first cyclone part 213a.

[0081] In this case, the second cyclone part 213b may be located inside the first cyclone part 213a to minimize the size of the cleaner 200. The second cyclone part 213b may be disposed under the suction motor 216. Specifically, the second cyclone part 213b may be disposed

inside the filter part 214. That is, the cyclone part 213 and the second cyclone part 213b may be disposed inside the dust bin 220 with the filter part 214 interposed therebetween.

[0082] The second cyclone part 213b may include a plurality of cyclone bodies 213ba disposed in parallel. Therefore, the air discharged from the second cyclone part 213b may pass through the filter part 214 and pass through a plurality of cyclone bodies 213ba. Thereafter, the air discharged from the cyclone body 213ba may flow upward and sequentially pass through the filter 270, the suction motor 216, and the air discharge cover 217.

[0083] As another example, the second cyclone part 213b may include a single cyclone body 213ba, and in this case, the axis of the cyclonic flow of the second cyclone part 213b may extend in the vertical direction.

[0084] At least a portion of the second cyclone part 213b may be disposed inside the first cyclone part 213a and may separate dust from the air discharged from the first cyclone part 213a.

[0085] The second cyclone part 213b may be composed of a set of axial flow cyclones formed to separate dust from air introduced in the axial direction.

[0086] The second cyclone part 213b may include the cyclone body 213ba, a vortex finder 213bb, a band member 213bc, and a guide vane 213bd.

[0087] The cyclone body 213ba is a component that adopts the principle of the dust collector that uses the centrifugal force to separate dust from the air discharged from the first cyclone part 213a. A space in which air may flow may be formed inside the cyclone body 213ba, and the air discharged from the first cyclone part 213a may flow into the cyclone body 213ba.

[0088] The cyclone body 213ba may be disposed inside the filter part 214. Specifically, at least a portion of the cyclone body 213ba may be disposed inside the filter body 214a, and air passing through a filter hole 214b may flow into the cyclone body 213ba.

[0089] A plurality of cyclone bodies 213ba may be provided. An air inlet forming an outer wall of a circumference of a hollow may be formed on each cyclone body 213ba. The outer walls of the circumference of the hollow formed by the cyclone body 213ba may correspond to outer walls of each axial flow cyclone. Air circulating along the inner circumferential surface of the cyclone body 213ba may form a cyclonic flow.

[0090] Dust that is heavier than air may rotate in a swirling flow with a radius of rotation larger than that of air. Since the dust rotates inside the cyclone body 213ba, a maximum rotation radius of the dust can be defined by the cyclone body 213ba.

[0091] A lower portion of the cyclone body 213ba may have an inclined shape that narrows downward. The reason why the lower portion of the cyclone body 213ba has a shape that narrows downward is to guide dust separated from the air to fall and prevent the dust from being discharged into the vortex finder 213bb along the air.

[0092] An air outlet may be formed on the lower portion of the cyclone body 213ba. That is, the dust separated from the air inside the cyclone body 213ba may be discharged from the cyclone body 213ba through the air outlet of the cyclone body 213ba. In addition, the lower portion of the cyclone body 213ba may communicate with internal spaces of the storage members 215 and 1215. Therefore, dust rotating along the swirling flow inside the cyclone body 213ba may fall and may be stored in the storage members 215 and 1215. The dust stored in the storage members 215 and 1215 may pass through a dust through hole 121a and may be discharged into a flow path part 180 when the dust collection motor 191 is driven.

[0093] An upper portion of the cyclone body 213ba may be formed to accommodate the vortex finder 213bb. The upper portion of the cyclone body 213ba may be formed to have a constant inner diameter. The upper and lower portions of the cyclone body 213ba may be distinguished with respect to a location at which the inner diameter narrows.

[0094] The outer circumferential surface of each cyclone body 213ba may be connected in contact with the nearby cyclone body 213ba to allow the plurality of cyclone bodies 213ba to form one member. A cross section of each cyclone body 213ba preferably has a circular shape as shown in the drawing. This is because, when the cross-section of the cyclone body 213ba is formed in a circular shape, a flow path for air and dust may be formed between the outer circumferential surfaces of adjacent cyclone bodies 213ba even when they are in close contact with each other. When the flow path of air and dust is formed between the cyclone bodies 213ba, there is an advantage in that a separate flow path structure does not need to be installed.

[0095] The cross section of each cyclone body 213ba is not excluded from being formed in a polygonal shape. However, even when the cross section of each cyclone body 213ba is formed in a polygonal shape, the cross section of the each cyclone body 213ba is preferably formed in a polygonal shape so that the flow path for air and dust may be formed.

[0096] The vortex finder 213bb and the band member 213bc may be disposed above the cyclone body 213ba to form a set of axial flow cyclones together with the cyclone body 213ba. The cyclone body 213ba may form some of the set, and the vortex finder 213bb and the band member 213bc may form the remaining part of the set. In this case, when the vortex finder 213bb and the band member 213bc are integrated, a set of axial flow cyclones may be formed by the plurality of cyclone bodies 213ba and one member.

[0097] The vortex finder 213bb is a component for discharging air passing through the cyclonic flow from the inside of the cyclone body 213ba. A flow path through which air may flow may be formed inside the vortex finder 213bb. A plurality of vortex finders 213bb may be provided, and each vortex finder 213bb may be disposed inside each cyclone body 213ba. A outer perimetric sur-

face of each vortex finder 213bb may be spaced apart from the inner circumferential surface of each cyclone body 213ba. Each vortex finder 213bb may have the air inlet forming the outer wall of the circumference of the hollow, and the air passing through the cyclone body 213ba may be discharged through the air inlet of each vortex finder 213bb. Thereafter, the air passing through each vortex finder 213bb may be discharged to the filter 270 through the air outlet of each vortex finder 213bb.

[0098] A lower portion of the vortex finder 213bb may have a greater height than the band member 213bc. However, an upper portion of the vortex finder 213bb may have the same height as the band member 213bc. A lower end of the vortex finder 213bb may protrude downward from the band member 213bc, but an upper end thereof may not be the case.

[0099] A cross section of each vortex finder 213bb preferably has a circular ring shape. The cross section of each vortex finder 213bb is not excluded from being formed in a polygonal shape. However, even when the cross section of each vortex finder 213bb is formed in a polygonal shape, the cross section of each vortex finder 213bb is preferably formed in a polygonal shape so that a flow path for air and dust may be formed.

[0100] The band member 213bc may be formed to surround the outer perimetric surface of the vortex finder 213bb. In this case, the band member 213bc may be named differently as needed. For example, names such as a ring portion, a ring portion, an edge portion, a perimeter portion, a circle portion, a support portion, a connection portion, an outer portion, a cyclone boundary portion, and an outer wall portion may be considered, and other names are also possible.

[0101] The band member 213bc may be seated on the filter body 214a and may have a shape corresponding to the upper portion of the filter body 214a. The upper portion of the filter body 214a may be formed in a circular shape, and the band member 213bc may also be formed in a circular shape surrounding the vortex finder 213bb. However, the upper portion of the filter body 214a and the band member 213bc are not excluded from being formed in a polygonal shape.

[0102] A location fixing step (not shown) of the band member 213bc may be fitted into the corresponding step (not shown) of the filter body 214a, thereby setting a coupling location and preventing arbitrary relative rotation. Since the arbitrary relative rotation may occur between the band member 213bc and the filter body 214a, the arbitrary relative rotation should be prevented for a normal operation of the second cyclone part 213b.

[0103] The vortex finder 213bb and the band member 213bc may be connected to form one integrated member.

[0104] The guide vane 213bd is a component for guiding the air discharged from the first cyclone part 213a to the inside of the cyclone body 213ba. The guide vane 213bd may form a guide flow path through which air may flow into the cyclone body 213ba. Therefore, the air flowing along the guide flow path may form a swirling

flow between the vortex finder 213bb and the cyclone body 213ba.

[0105] At least a portion of the guide vane 213bd may be disposed between the cyclone body 213ba and the vortex finder 213bb and connected to each cyclone body 213ba and each vortex finder 213bb. One side of the guide vane 213bd may be connected to an outer surface of the vortex finder 213bb in a spiral direction, and the other side of the guide vane 213bd may be connected to an inner surface of the cyclone body 213ba in the spiral direction.

[0106] A plurality of guide vanes 213bd may be provided on each cyclone body 213ba and each vortex finder 213bb, and the guide vanes 213bd may extend in the spiral direction to generate a swirling flow. As the guide vane 213bd extends in the spiral direction, the guide flow path may also extend in the spiral direction, and the air and dust flowing into the air inlet of the cyclone body 213ba may form a swirling flow.

[0107] The filter part 214 may filter the air discharged from the cyclone part 213. The filter part 214 may guide the air separated from dust in the cyclone part 213 to the second cyclone part 213b. That is, the filter part 214 may be a mesh filter having a plurality of holes.

[0108] The filter part 214 may include the filter body 214a and the filter hole 214b.

[0109] The filter body 214a may be disposed inside the dust bin 220. Specifically, the filter body 214a may be disposed inside the cyclone part 213. The second cyclone part 213b may be disposed inside the filter body 214a. The filter body 214a may be disposed between the cyclone part 213 and the second cyclone part 213b. A cyclonic flow may be formed along the outer circumference of the filter body 214a.

[0110] The filter body 214a is not limited, but may be formed in a cylindrical shape. A central axis of the filter body 214a may extend in the vertical direction. The central axis of the filter body 214a may extend in the longitudinal direction of the filter body 214a.

[0111] For example, the central axis of the filter body 214a may be formed coaxially with the axis a2 of the cyclonic flow. As another example, the central axis of the filter body 214a may be disposed parallel to the axis a2 of the cyclonic flow.

[0112] The storage members 215 and 1215 may be disposed under the filter body 214a.

[0113] The filter hole 214b may guide air to the inside of the filter body 214a. A plurality of filter holes 214b may be formed in the longitudinal direction along the outer circumference of the filter body 214a.

[0114] The filter hole 214b is a hole with a predetermined diameter, and large foreign substances contained in the air discharged from the cyclone part 213 may be filtered through the filter hole 214b. Therefore, foreign substances such as hair are filtered by the filter hole 214b. The air passing through the filter hole 214b may flow into the second cyclone part 213b disposed inside the filter body 214a.

[0115] In this case, an outside and/or outer portion of the filter body 214a may refer to a direction facing the cyclone part 213 with respect to the filter body 214a, and an inside and/or inner portion of the filter body 214a may refer to a direction facing the second cyclone part 213b with respect to the filter body 214a.

[0116] Meanwhile, the cyclonic flow generated from the cyclone part 213 may include at least one bending point at which a proceeding direction is switched from the direction in which the cyclonic flow flows along the outside of the filter body 214a to the direction in which the cyclonic flow flows into the filter body 214a through the filter hole 214b.

[0117] As an example, the proceeding direction of the cyclonic flow flowing along the outside of the filter body 214a may be switched to a direction that flows into the filter body 214a from the inlet side of the filter hole 214b by the suction force of the suction motor 216. As another example, the proceeding direction of the cyclonic flow flowing along the outside of the filter body 214a may be switched to the direction that flows into the filter body 214a from the inlet side of the filter hole 214b by the suction force of the dust collection motor 191.

[0118] In this case, the inlet side of the filter hole 214b may refer to a space in which air flows from the cyclone part 213 to the filter hole 214b. Specifically, the inlet side of the filter hole 214b may refer to a space that is the boundary between the filter hole 214b and the cyclone part 213. In addition, the outlet side of the filter hole 214b may refer to a space in which air is discharged from the filter hole 214b to the second cyclone part 213b. Specifically, the outlet side of the filter hole 214b may refer to a space that is the boundary between the filter hole 214b and the second cyclone part 213b.

[0119] The storage members 215 and 1215 in which the dust separated from the second cyclone part 213b is stored may be disposed inside the dust bin 220. The storage members 215 and 1215 may be coupled to the lower side of the second cyclone part 213b and may be in contact with an upper surface of a discharge cover 222. The lower sides of the storage members 215 and 1215 may be open.

[0120] The storage members 215 and 1215 are components for storing the dust separated from first dust storage parts 215a and 1215a and/or second dust storage parts 215b and 1215b.

[0121] The storage members 215 and 1215 may partition the space inside the dust bin 220 into the first dust storage parts 215a and 1215a in which the dust separated from the first cyclone part 213a is stored, and the second dust storage parts 215b and 1215b in which the dust separated from the second cyclone part 213b is stored. Therefore, spaces formed between the storage members 215 and 1215 and the dust bin 220 can be defined as the first dust storage parts 215a and 1215a, and lower inner spaces of the storage member 215 and 1215 can be defined as the second dust storage parts 215b and 1215b.

[0122] Lower portions of the first dust storage parts 215a and 1215a and lower portions of the second dust storage parts 215b and 1215b may be open. In this case, the open lower portions of the second dust storage parts 215b and 1215b may be dust outlets 215ba and 1215ba.

[0123] The first dust storage parts 215a and 1215a may be selectively opened and closed by the discharge cover 222. The first dust storage parts 215a and 1215a may be exposed to the outside by the discharge cover 222.

[0124] When the dust collection motor 191 is driven in a state in which the discharge cover 222 and a door 141 are opened, the dust in the first dust storage parts 215a and 1215a and the second dust storage parts 215b and 1215b may flow into the flow path part 180 through the dust through hole 121a.

[0125] The suction motor 216 may generate a suction force of suctioning air. The suction motor 216 may be accommodated in the main body housing 211. The suction motor 216 may generate a suction force by rotation. As an example, the suction motor 216 may be provided in a shape similar to a cylindrical shape.

[0126] In this case, a cyclonic flow of the cyclone part 213 may be generated by the suction force of the suction motor 216. Specifically, when the suction motor 216 is operated, the air suctioned into the suction part 212 by the suction airflow generated by the suction motor 216 may generate the cyclonic flow in the cyclone part 213.

[0127] Meanwhile, in the present embodiment, a virtual suction motor axial line a4 extending the rotational axis of the suction motor 216 may be formed.

[0128] The air discharge cover 217 may be disposed at one side of the main body housing 211 in the axial direction. The air discharge cover 217 may accommodate a filter for filtering air. For example, the air discharge cover 217 may accommodate a HEPA filter.

[0129] An air outlet (not shown) through which the air suctioned by the suction force of the suction motor 216 is discharged may be formed on the air discharge cover 217.

[0130] A flow guide may be disposed on the air discharge cover 217. The flow guide may guide a flow of the air discharged through the air outlet (not shown).

[0131] The handle 218 may be gripped by a user. The handle 218 may be disposed behind the suction motor 216. As an example, the handle 218 may be formed in a shape similar to a cylindrical shape. Alternatively, the handle 218 may be formed in a curved cylindrical shape. The handle 218 may be disposed at a predetermined angle with the main body housing 211, the suction motor 216, or the cyclone part 213.

[0132] The handle 218 may include a grip portion formed in the form of a pillar to allow the user to grip the same, 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 216, 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 dust bin 220.

[0133] Meanwhile, in the present embodiment, a virtual grip portion through axis a5 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.

[0134] As an example, the grip portion through axis a5 may be a virtual line formed inside the cylindrical handle 218 and may be a virtual line formed parallel to at least a portion of an outer surface (outer perimetric surface) of the grip portion.

[0135] An upper surface of the handle 218 may form a partial appearance of the upper surface of the cleaner 200. Therefore, when the user grips the handle 218, one component of the cleaner 200 can be prevented from being in contact with the user's arm.

[0136] The first extension may extend from the grip portion toward the main body housing 211 or the suction motor 216. At least a portion of the first extension may extend in a horizontal direction.

[0137] The second extension may extend from the grip portion toward the dust bin 220. At least a portion of the second extension may extend in the horizontal direction.

[0138] The manipulation part 219 may be disposed on the handle 218. The manipulation part 219 may be disposed on an inclined surface formed on an upper region of the handle 218. The user may input an operation or stop command of the cleaner 200 through the manipulation part 219.

[0139] The cleaner 200 may include the dust bin 220. The dust bin 220 may store the dust suctioned through the suction part 212. The dust bin 220 may store the dust separated from the cyclone part 213.

[0140] The dust bin 220 may include a dust bin main body 221, the discharge cover 222, a dust bin compression lever 223, and a compression member (not shown).

[0141] The dust bin main body 221 may communicate with the suction part 212. Specifically, when the suction motor 216 is driven, the dust bin main body 221 may communicate with the suction part 212.

[0142] The dust bin main body 221 may provide a space in which the dust separated from the cyclone part 213 may be stored. As an example, the dust bin main body 221 may be formed similarly to a cylindrical shape.

[0143] Meanwhile, in the present specification, a virtual dust bin through line, which passes through the inside (internal space) of the dust bin main body 221 and formed to extend in the longitudinal direction (which refers to an axial direction in the cylindrical dust bin main body 221) of the dust bin main body 221, may be formed. Specifically, in the present specification, the dust bin central axis a3, which refers to the axial direction of the cylindrical dust bin main body 221, can be defined.

[0144] The dust bin central axis a3 may extend in the longitudinal direction of the dust bin 220. Specifically, the dust bin central axis a3 may extend in the longitudinal direction of the dust bin main body 221. Therefore, the dust bin central axis a3 may be an axis of the dust bin 220

in the longitudinal direction.

[0145] In addition, in the present specification, the axis a2 of the cyclonic flow, the dust bin central axis a3, and the suction motor axial line a4 may be disposed to match each other or in parallel.

[0146] A portion of a lower surface (bottom surface) of the dust bin main body 221 may be open. In addition, a lower surface extension (not shown) may be formed on the lower surface (bottom surface) of the dust bin main body 221. The lower surface extension (not shown) may be formed to block a portion of the lower surface of the dust bin main body 221.

[0147] The dust bin 220 may include the discharge cover 222. The discharge cover 222 may be disposed on the lower surface of the dust bin 220.

[0148] The discharge cover 222 may be provided to open and close one end portion of the dust bin main body 221 in the longitudinal direction. The discharge cover 222 may selectively open and close a downward opened lower portion of the dust bin 220. The discharge cover 222 may selectively open and close the first dust storage parts 215a and 1215a that are opened downward.

[0149] The discharge cover 222 may include a cover main body 222a and a hinge part 222b. The cover main body 222a may be formed to block a portion of the lower surface of the dust bin main body 221. The cover body 222a may rotate downward with respect to the hinge part 222b. The hinge part 222b may be disposed adjacent to the battery housing 230. The hinge part 222b may be provided with a torsion spring (not shown). Therefore, when the discharge cover 222 is separated from the dust bin main body 221, the cover main body 222a may be supported in a state of being rotated about the hinge part 222b at a predetermined angle or more in the dust bin main body 221 by an elastic force of the torsion spring (not shown).

[0150] The discharge cover 222 may be coupled to the dust bin 220 through hook coupling. Meanwhile, the discharge cover 222 may be separated from the dust bin 220 through a coupling lever 222c. The coupling lever 222c may be disposed in front of the dust bin. Specifically, the coupling lever 222c may be disposed on a front outer surface of the dust bin 220. When an external force is applied, the coupling lever 222c may elastically deform a hook extending from the cover main body 222a to release the hook coupling between the cover main body 222a and the dust bin main body 221.

[0151] When the discharge cover 222 is closed, the lower surfaces of the first dust storage parts 215a and 1215a may be blocked (sealed) by the discharge cover 222 and the lower surface extension (not shown).

[0152] The dust bin 220 may include a dust bin compression lever 223 (see FIG. 4). The dust bin compression lever 223 may be disposed outside the dust bin 220 or the cyclone part 213. The dust bin compression lever 223 may be disposed to move up and down outside the dust bin 220 or the cyclone part 213. The dust bin compression lever 223 may be connected to the compression

member (not shown). When the dust bin compression lever 223 is moved down by an external force, the compression member (not shown) may also move down. Therefore, user convenience can be provided. The compression member (not shown) and the dust bin compression lever 223 may be returned to original locations by an elastic member (not shown). Specifically, when the external force applied to the dust bin compression lever 223 is removed, the elastic member may move the dust bin compression lever 223 and the compression member (not shown) up.

[0153] The compression member (not shown) may be disposed inside the dust bin main body 221. The compression member may move in the internal space of the dust bin main body 221. Specifically, the compression member may move up and down in the dust bin main body 221. Therefore, the compression member may compress the dust in the dust bin main body 221 downward. In addition, when the discharge cover 222 is separated from the dust bin main body 221 and the lower portion of the dust bin 220 is opened, the compression member may move from the upper portion to the lower portion of the dust bin 220 to remove a foreign substance such as the remaining dust in the dust bin 220. Therefore, it is possible to increase the suction force of the cleaner by preventing the remaining dust from remaining in the dust bin 220. In addition, bad odors generated by the residue can be removed by preventing the remaining dust from remaining in the dust bin 220.

[0154] The cleaner 200 may include the battery housing 230. A battery 240 may be accommodated in the battery housing 230. The battery housing 230 may be disposed under the handle 218. As an example, the battery housing 230 may have a hexahedral shape with an open lower portion. A rear surface of the battery housing 230 may be connected to the handle 218.

[0155] The battery housing 230 may include an accommodation portion that is opened downward. The battery 240 may be detachably attached through the accommodation portion of the battery housing 230.

[0156] The cleaner 200 may include the battery 240.

[0157] For example, the battery 240 may be detachably coupled to the cleaner 200. The battery 240 may be detachably coupled to the battery housing 230. As an example, the battery 240 may be inserted into the battery housing 230 from the bottom of the battery housing 230. With this configuration, it is possible to improve the portability of the cleaner 200.

[0158] In contrast, the battery 240 may be provided integrally inside the battery housing 230. In this case, a lower surface of the battery 240 is not exposed to the outside.

[0159] The battery 240 may supply power to the suction motor 216 of the cleaner 200. The battery 240 may be disposed under the handle 218. The battery 240 may be disposed behind the dust bin 220.

[0160] According to an 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 placed on the floor, the battery 240 may be immediately separated from the battery housing 230. In addition, since the lower surface of the battery 240 is exposed to the outside and is in direct contact with the external air of the battery 240, it is possible to improve the cooling performance of the battery 240.

[0161] Meanwhile, when the battery 240 is integrally fixed to the battery housing 230, the structure for attaching and detaching the battery 240 and the battery housing 230 can be reduced, and thus it is possible to reduce the overall size of the cleaner 200 and achieve lightweight.

[0162] The cleaner 200 may include the extension pipe 250. The extension pipe 250 may communicate with the cleaning module 260. The extension pipe 250 may communicate with the main body 210. The extension pipe 250 may communicate with the suction part 212 of the main body 210. The extension pipe 250 may be formed in a long cylindrical shape.

[0163] The main body 210 may be connected to the extension pipe 250. The main body 210 may be connected to the cleaning module 260 through the extension pipe 250. The main body 210 may generate the suction force through the suction motor 216 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.

[0164] The cleaner 200 may include the cleaning module 260. The cleaning module 260 may communicate with the extension pipe 250. Therefore, external air may pass through the cleaning module 260 and the extension pipe 250 and flow into the main body 210 of the cleaner 200 by the suction force generated from the main body 210 of the cleaner 200.

[0165] Dust in the dust bin 220 of the cleaner 200 may be collected in the dust collection part 170 of the cleaner station 100 by gravity and the suction force of the dust collection motor 191. Therefore, since the dust in the dust bin can be removed without the user's separate manipulation, user convenience can be provided. In addition, it is possible to eliminate the user's inconvenience having to empty the dust bin every time. In addition, it is possible to prevent the scattering of dust when the user empties the dust bin.

[0166] 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 held on a coupling part 120. More specifically, the dust bin 220 and the battery housing 230 of the cleaner 200 may be coupled to a coupling surface 121, an outer circumferential surface of the dust bin main body 221 may be coupled to a dust bin guide surface 122, and the suction part 212 may be coupled to a suction part guide surface 126 of the coupling part 120. In this case, the dust bin central axis a3 may be disposed in a direction parallel to the ground, and the extension pipe 250 may be disposed in a direction perpendicular to the ground.

[0167] The cleaner 200 may include the filter 270. The filter 270 may separate dust from the air passing through the second cyclone part 213b. The filter 270 may be disposed inside the main body housing 211. The filter 270 may be configured in a shape similar to a cylinder. When the filter 270 is disposed inside the main body housing 211, the filter 270 may partition the inside of the main body housing 211 into an internal space 270a and an external space 270b of the filter.

[0168] The filter 270 may be disposed above the second cyclone part 213b. The filter 270 may be disposed under the suction motor 216. The filter 270 may be disposed between the second cyclone part 213b and the suction motor 216.

[0169] Meanwhile, in the present specification, "above" may refer to a direction in which the suction motor 216 is disposed with respect to the second cyclone part 213b, and "under" may refer to a direction in which the second dust storage parts 215b and 1215b are disposed with respect to the second cyclone part 213b.

[0170] When the suction motor 216 is driven, air passing through the second cyclone part 213b may flow from the outside to the inside of the filter 270. Specifically, when the suction motor 216 is driven, the air passing through the second cyclone part 213b may flow into the external space 270b of the filter. Thereafter, the air flowing into the external space 270b of the filter may pass through the filter 270 and flow into the internal space 270a of the filter. Thereafter, the air flowing into the internal space 270a of the filter may flow into the suction motor 216. Thereafter, the air flowing into the suction motor 216 may be discharged to the outside through the air outlet of the air discharge cover 217.

[0171] The cleaner station 100 of the present disclosure will be described with reference to FIGS. 1 and 2 as follows.

[0172] 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 the dust of the dust bin 220 of the cleaner 200.

[0173] The cleaner station 100 may include the housing 110. The housing 110 may form the appearance of the cleaner station 100. Specifically, the housing 110 may be formed in a pillar shape including at least one outer wall surface. As an example, the housing 110 may be formed in a shape similar to a quadrangular pillar.

[0174] The housing 110 may have a space in which the dust collection unit 170 for storing dust therein and the dust suction module 190 for generating a flow force of collecting dust into the dust collection part 170 may be accommodated.

[0175] The housing 110 may include a bottom surface 111, an outer wall surface 112, and an upper surface 113.

[0176] The bottom surface 111 may support the lower side of the dust suction module 190 in a direction of

gravity. That is, the bottom surface 111 may support the lower side of the dust collection motor 171 of the dust suction module 190.

[0177] In this case, the bottom surface 111 may be disposed toward the ground. The bottom surface 111 may be not only disposed parallel to the ground, but also disposed to be inclined at a predetermined angle with the ground. With this configuration, there is an advantage in that the dust collection motor 171 can be stably supported and the overall weight can be balanced even when the cleaner 200 is coupled.

[0178] Meanwhile, according to the embodiment, the bottom surface 111 may further include a ground support portion 111a that increases an area in contact with the ground to prevent the cleaner station 100 from falling and maintain balance. As an example, the ground support portion may be in the form of a plate extending from the bottom surface 111, and one or more frames may be formed to protrude and extend from the bottom surface 111 in the direction of the ground.

[0179] The outer wall surface 112 may be a surface formed in the direction of gravity and may be a surface connected to the bottom surface 111. For example, the outer wall surface 112 may be a surface connected perpendicularly to the bottom surface 111. In another embodiment, the outer wall surface 112 may be disposed to be inclined at a predetermined angle with the bottom surface 111.

[0180] The outer wall surface 112 may include at least one surface. As an example, the outer wall surface 112 may include a first outer wall surface 112a, a second outer wall surface (not shown), a third outer wall surface 112c, and a fourth outer wall surface (not shown).

[0181] In this case, in the present embodiment, the first outer wall surface 112a may be disposed on a front surface of the cleaner station 100. Here, the front surface may be a surface on which the cleaner 200 is exposed in a state in which the cleaner 200 is coupled to the cleaner station 100. Therefore, the first outer wall surface 112a may form the appearance of the front surface of the cleaner station 100.

[0182] 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 vacuum cleaner 200 is held on the cleaner station 100.

[0183] When the cleaner 200 is held 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 the front.

[0184] From another perspective, when the cleaner 200 is held on the cleaner station 100, a direction in which the suction motor 216 of the cleaner 200 is disposed may be referred to as the front. In addition, a direction opposite to the direction in which the suction motor 216 is disposed in the cleaner station 100 may be referred to as the rear.

[0185] In addition, a surface in a direction facing the front surface with respect to the internal space of the

housing 110 may be referred to as the rear surface of the cleaner station 100. Therefore, the rear surface may refer to a direction in which the second outer wall surface (not shown) is formed.

[0186] In addition, when viewing the front surface with respect to the internal space of the housing 110, a left surface may be referred to as a left side, and a right surface may be referred to as a right side. Therefore, the left surface may refer to a direction in which the third outer wall surface 112c is formed, and the right surface may refer to the direction in which the fourth outer wall surface (not shown) is formed.

[0187] The first outer wall surface 112a may be formed not only in a flat shape, but also entirely in a curved shape, and a portion thereof may be formed to include a curved surface.

[0188] The first outer wall surface 112a may have the appearance corresponding to the shape of the cleaner 200. Specifically, the coupling part 120 may be disposed on the first outer wall surface 112a. With this configuration, the cleaner 200 may be coupled to the cleaner station 100 and supported by the cleaner station 100. A detailed configuration of the coupling part 120 will be described below.

[0189] Meanwhile, a structure for holding various types of cleaning modules 260 used in the cleaner 200 may be added to the first outer wall surface 112a.

[0190] In the present embodiment, the second outer wall surface (not shown) may be a surface facing the first outer wall surface 112a. That is, the second outer wall surface (not shown) may be disposed on the rear surface of the cleaner station 100. Here, the rear surface may be a surface facing the surface to which the cleaner 200 is coupled. Therefore, the second outer wall surface (not shown) may form the appearance of the rear surface of the cleaner station 100.

[0191] As an example, the second outer wall surface (not shown) may be formed in a flat shape. With this configuration, the cleaner station 100 may in close contact with an interior wall and may stably support the cleaner station 100.

[0192] As another example, a structure for holding various types of cleaning modules 260 used in the cleaner 200 may be added to the second outer wall surface (not shown).

[0193] In the present embodiment, the third outer wall surface 112c and the fourth outer wall surface (not shown) may be surfaces for connecting the first outer wall surface 112a with the second outer wall surface (not shown). In this case, the third outer wall surface 112c may be disposed on the left surface of the station 100, and the fourth outer wall surface (not shown) 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 (not shown) may be disposed on the left surface of the cleaner station 100.

[0194] The third outer wall surface 112c or the fourth

outer wall surface (not shown) may be formed not only in a flat shape, but also entirely in a curved shape, and portions thereof may be formed to include a curved surface.

[0195] Meanwhile, a structure for holding various types of cleaning modules 260 used in the cleaner 200 may be added to the third outer wall surface 112c or the fourth outer wall surface (not shown).

[0196] The upper surface 113 may form the appearance of the upper side of the cleaner station. That is, the upper surface 113 may be a surface that is disposed at the uppermost side of the cleaner station in the direction of gravity and exposed to the outside.

[0197] For reference, in the present embodiment, the upper and lower sides may be upper and lower sides, respectively, in the direction of gravity (direction perpendicular to the ground) in a state in which the cleaner station 100 is installed on the ground.

[0198] In this case, the upper surface 113 may be disposed not only parallel to the ground, but also to be inclined at a predetermined angle with the ground.

[0199] A display part 410 may be disposed on the upper surface 113. As an example, the display part 410 may display the state of the cleaner station 100 and the state of the cleaner 200 and also display information such as cleaning progress and a map of a cleaning zone.

[0200] Meanwhile, according to the embodiment, the upper surface 113 may be provided separately from the outer wall surface 112. In this case, when the upper surface 113 is separated, a battery separated from the cleaner 200 may be accommodated in the internal space surrounded by the outer wall surface 112 and provided with a terminal (not shown) for charging the separated battery.

[0201] FIG. 6 shows a view for describing the relationship between a cleaner and a door unit in the cleaner station according to the embodiment of the present disclosure, and FIG. 7 shows a view for describing the relationship between the cleaner and a cover opening unit in the cleaner station according to the embodiment of the present disclosure.

[0202] The coupling part 120 of the cleaner station 100 of the present disclosure will be described as follows.

[0203] The cleaner station 100 may include the coupling part 120 to which the cleaner 200 is coupled. Specifically, the coupling part 120 may be disposed on the first outer wall surface 112a, and the main body 210, the dust bin 220, and the battery housing 230 of the cleaner 200 may be coupled.

[0204] The coupling part 120 may include the coupling surface 121. The coupling surface 121 may be disposed on a side surface of the housing 110. As an example, the coupling surface 121 may be a surface formed in a concave groove shape from the first outer wall surface 112a toward the inside of the cleaner station 100. That is, the coupling surface 121 may be a surface formed by forming a step with the first outer wall surface 112a.

[0205] The cleaner 200 may be coupled to the coupling surface 121. As an example, the coupling surface 121 may be in contact with the lower surfaces of the dust bin 220 and the battery housing 230 of the cleaner 200. Here, the lower surface may be a surface facing the ground when the user uses the cleaner 200 or places the cleaner 200 on the ground.

[0206] As an example, an angle formed by the coupling surface 121 and the ground may be a right angle. Therefore, when the cleaner 200 is coupled to the coupling surface 121, it is possible to minimize a space of the cleaner station 100.

[0207] As another example, the coupling surface 121 may be disposed to be inclined at a predetermined angle with the ground. Therefore, when the cleaner 200 is coupled to the coupling surface 121, the cleaner station 100 can be stably supported.

[0208] The dust through hole 121a may be formed in the coupling surface 121 to allow external air of the housing 110 to flow therein. The dust through hole 121a may be formed in a hole shape corresponding to the shape of the dust bin 220 to allow dust in the dust bin 220 to flow into the dust collection part 170. The dust through hole 121a may be formed to correspond to the shape of the discharge cover 222 of the dust bin 220. The dust through hole 121a may be formed to communicate with a first suction flow path 181 to be described below.

[0209] The coupling part 120 may include the dust bin guide surface 122. The dust bin guide surface 122 may be disposed on the first outer wall surface 112a. The dust bin guide surface 122 may be connected to the first outer wall surface 112a. In addition, the dust bin guide surface 122 may be connected to the coupling surface 121.

[0210] The dust bin guide surface 122 may be formed in a shape corresponding to the outer surface of the dust bin 220. The front outer surface of the dust bin 220 may be coupled to the dust bin guide surface 122. Therefore, the convenience of coupling the cleaner 200 to the coupling surface 121 can be provided.

[0211] Meanwhile, a protrusion movement hole 122a may be formed in the dust bin guide surface 122, and a push protrusion 151 to be described below may be moved linearly along the protrusion movement hole 122a. In addition, a gear box 155 for accommodating a gear of the cover opening unit 150 to be described below, etc. may be provided under the dust bin guide surface 122 in the direction of gravity. In this case, a guide space 122b in which the push protrusion 151 may move may be formed between a lower surface of the dust bin guide surface 122 and an upper surface of the gear box 155. In addition, the guide space 122b may communicate with the first suction flow path 181 through a bypass hole 122c. That is, the protrusion movement hole 122a, the guide space 122b, the bypass hole 122c, and the first suction flow path 181 may form one bypass flow path (see FIG. 14). With this configuration, when the dust collection motor 191 is operated in a state in which the dust bin 220 is coupled to the coupling part 120, there is an advantage

in that dust, etc. remaining on the dust bin 220 and the dust bin guide surface 122 may be suctioned through the bypass flow path.

[0212] The coupling part 120 may include a guide protrusion 123. The guide protrusion 123 may be disposed on the coupling surface 121. The guide protrusion 123 may protrude upward from the coupling surface 121. Two guide protrusions 123 may be disposed to be spaced apart from each other. A distance between the two guide protrusions 123 spaced apart from each other may correspond to a width of the battery housing 230 of the cleaner 200. Therefore, the convenience of coupling the cleaner 200 to the coupling surface 121 can be provided.

[0213] The coupling part 120 may include a side wall 124. The side wall 124 may be a wall surface disposed on both side surfaces of the coupling surface 121 and connected perpendicularly to the coupling surface 121. The side wall 124 may be connected to the first outer wall surface 112a. In addition, the side wall 124 may form a surface connected to the dust bin guide surface 122. Therefore, the cleaner 200 can be stably accommodated.

[0214] The coupling part 120 may include a coupling sensor 125. The coupling sensor 125 may detect whether the cleaner 200 is coupled to the coupling part 120.

[0215] The coupling sensor 125 may include a contact sensor. As an example, the coupling sensor 125 may include a micro switch. In this case, the coupling sensor 125 may be disposed on the guide protrusion 123. Therefore, when the battery housing 230 or the battery 240 of the cleaner 200 is coupled between the pair of guide protrusions 123, the cleaner 200 is in contact with the coupling sensor 125, and the coupling sensor 125 may detect that it has been coupled to the cleaner 200.

[0216] Meanwhile, the coupling sensor 125 may include a non-contact sensor. As an example, the coupling sensor 125 may include an infrared sensor (IR sensor). In this case, the coupling sensor 125 may be disposed on the side wall 124. Therefore, when the dust bin 220 or the main body 210 of the cleaner 200 passes through the side wall 124 and reaches the coupling surface 121, the coupling sensor 125 may detect the presence of the dust bin 220 or the main body 210.

[0217] The coupling sensor 125 may face the dust bin 220 or the battery housing 230 of the cleaner 200.

[0218] The coupling sensor 125 may be a member of determining whether power is applied to the battery 240 of the cleaner 200 and whether the cleaner 200 has been coupled.

[0219] The coupling part 120 may include a suction part guide surface 126. The suction part guide surface 126 may be disposed on the first outer wall surface 112a. The suction part guide surface 126 may be connected to the dust bin guide surface 122. The suction part 212 may be coupled to the suction part guide surface 126. A shape of the suction part guide surface 126 may be formed in a shape corresponding to the shape of the suction part 212.

[0220] The coupling part 120 may further include a

fixing member entrance hole 127. The fixing member entrance hole 127 may be formed in the form of a long hole along the side wall 124 to allow the fixing member 131 to enter and exit.

5 [0221] With this configuration, when the user couples the cleaner 200 to the coupling part 120 of the cleaner station 100, the main body 210 of the cleaner 200 may be stably disposed on the coupling part 120 by the dust bin guide surface 122, the guide protrusion 123, and the suction part guide surface 126. Therefore, convenience of coupling the dust bin 220 and the battery housing 230 of the cleaner 200 to the coupling surface 121 can be provided.

10 [0222] A fixing unit 130 according to the present disclosure will be described as follows.

[0223] The cleaner station 100 according to the present disclosure may include the fixing unit 130. The fixing unit 130 may be disposed on the side wall 124. In addition, at least a portion of the fixing unit 130 may be disposed on a rear surface of the coupling surface 121. The fixing unit 130 may fix the cleaner 200 coupled to the coupling surface 121. Specifically, the fixing unit 130 may fix the dust bin 220 and the battery housing 230 of the cleaner 200 coupled to the coupling surface 121.

20 [0224] The fixing unit 130 may include a fixing member 131 for fixing the dust bin 220 and the battery housing 230 of the cleaner 200, and a fixing unit motor 133 for driving the fixing member 131. In addition, the fixing unit 130 may further include a fixing unit link (not shown) for transmitting the power of the fixing unit motor 133 to the fixing member 131.

25 [0225] The fixing member 131 may be disposed on the side wall 124 of the coupling part 120 and may be provided to reciprocate on the side wall 124 to fix the dust bin 220. Specifically, the fixing member 131 may be accommodated inside the fixing member entrance hole 127.

30 [0226] The fixing member 131 may be disposed at each of both sides of the coupling part 120. As an example, a pair of two fixing members 131 may be disposed symmetrically with respect to the coupling surface 121.

35 [0227] The fixing unit motor 133 may provide power for moving the fixing member 131.

[0228] The fixing unit link (not shown) may convert a rotational force of the fixing unit motor 133 into the reciprocating movement of the fixing unit member 131.

40 [0229] When coupled to the cleaner 200, a fixing sealer 136 may be disposed on the dust bin guide surface 122 to airtighten the dust bin 220. With this configuration, when the dust bin 220 of the cleaner 200 is coupled, the fixing sealer 136 may be pressed by the self-weight of the cleaner 200, and the dust bin 220 and the dust bin guide surface 122 may be sealed.

45 [0230] The fixing sealer 136 may be disposed on a virtual extension line of the fixing member 131. With this configuration, when the fixing unit motor 133 is operated to allow the fixing member 131 to press the dust bin 220, a perimeter of the dust bin 220 at the same height may be

sealed.

[0231] According to an embodiment, the fixing sealer 136 may be disposed on the dust bin guide surface 122 in the form of a bent line corresponding to the arrangement of the cover opening unit 150 to be described below.

[0232] Therefore, when the main body 210 of the cleaner 200 is disposed on the coupling part 120, the fixing unit 130 may fix the main body 210 of the cleaner 200. Specifically, when the coupling sensor 125 detects that the main body 210 of the cleaner 200 is coupled to the coupling part 120 of the cleaner station 100, the fixing unit motor 133 may fix the main body 210 of the cleaner 200 by moving the fixing member 131.

[0233] Therefore, it is possible to increase the suction force of the cleaner by preventing the remaining dust from remaining in the dust bin. In addition, bad odors generated by the residue can be removed by preventing the remaining dust from remaining in the dust bin.

[0234] A door unit 140 according to the present disclosure will be described with reference to FIGS. 2, 6, and 8 as follows.

[0235] The cleaner station 100 according to the present disclosure may include the door unit 140. The door unit 140 may be configured to open and close the dust through hole 121a.

[0236] The door unit 140 may include the door 141, a door motor 142, and a door arm 143.

[0237] The door 141 may be hinge-coupled to the coupling surface 121 to open and close the dust through hole 121a. The door 141 may include a door main body 141a.

[0238] The door main body 141a may be formed in a shape that may block the dust through hole 121a. As an example, the door main body 141a may be formed similarly to a disk shape.

[0239] Based on a state in which the door main body 141a blocks the dust through hole 121a, the hinge part may be disposed at an upper side of the door body 141a, and an arm coupling part 141b may be disposed at a lower side of the door main body 141a.

[0240] The door main body 141a may be formed in a shape that may airtighten the dust through hole 121a. As an example, an outer surface exposed to the outside of the cleaner station 100 of the door main body 141a is formed to have a diameter corresponding to a diameter of the dust through hole 121a, and an inner surface disposed inside the cleaner station 100 of the door main body 141a is formed to have a diameter greater than the diameter of the dust through hole 121a. In addition, a step may occur between the outer surface and the inner surface of the door main body 141a. Meanwhile, at least one reinforcing rib for connecting the hinge part to the arm coupling part 141b and reinforcing a support strength of the door main body 141a may be formed to protrude from the inner surface of the door main body 141a.

[0241] The hinge part may be a member for hinge-coupling the door 141 to the coupling surface 121. The hinge part may be disposed at an upper end portion of the

door main body 141a and coupled to the coupling surface 121.

[0242] The arm coupling part 141b may be a member rotatably coupled to the door arm 143. The arm coupling part 141b may be disposed under the door main body 141a, rotatably coupled to the door main body 141a, and rotatably coupled to the door arm 143.

[0243] With this configuration, when the door arm 143 pulls the door main body 141a in a state in which the door 141 closes the dust through hole 121a, the door main body 141a may be moved by rotating about the hinge part toward the inside of the cleaner station 100 to open the dust through hole 121a. Meanwhile, in a state in which the dust through hole 121a is opened, when the door arm 143 pushes the door main body 141a, the door main body 141a may be moved by rotating about the hinge part 141b toward the outside of the cleaner station 100 to close the dust through hole 121a.

[0244] 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 dust bin body 210, the door 141 may be in contact with the discharge cover 222. In addition, as the door 141 rotates, the discharge cover 222 may be rotated by interworking with the door 141.

[0245] The door motor 142 may provide power for rotating the door 141. Specifically, the door motor 142 may rotate the door arm 143 in a forward or reverse direction. Here, the forward direction may be a direction in which the door arm 143 pulls the door 141. Therefore, when the door arm 143 rotates in the forward direction, the dust through hole 121a may be opened. In addition, the reverse direction may be a direction in which the door arm 143 pushes the door 141. Therefore, when the door arm 143 rotates in the reverse direction, at least a portion of the dust through hole 121a may be closed. The forward direction may be a direction opposite to the reverse direction.

[0246] The door arm 143 may connect the door 141 to the door motor 142 and open and close the door 141 using the power generated from the door motor 142.

[0247] As an example, the door arm 143 may include a first door arm 143a and a second door arm 143b. One end portion of the first door arm 143a may be coupled to the door motor 142. The first door arm 143a may be rotated by the power of the door motor 142. The other end portion of the first door arm 143a may be rotatably coupled to the second door arm 143b. The first door arm 143a may transmit the force transmitted from the door motor 142 to the second door arm 143b. One end portion of the second door arm 143b may be coupled to the first door arm 143a. The other end portion of the second door arm 143b may be coupled to the door 141. The second door arm 143b may open and close the dust through hole 121a by pushing or pulling the door 141.

[0248] The door unit 140 may further include a door opening and closing detection part 144. The door opening and closing detection part 144 may be provided inside the housing 110 and may detect whether the door 141 is

in an open state.

[0249] As an example, the door opening and closing detection part 144 may be disposed at each of both end portions of a rotational movement region of the door arm 143. As another example, the door opening and closing detection part 144 may be disposed at each of both end portions of a movement region of the door 141.

[0250] Therefore, when the door arm 143 moves to a preset door opening location or the door 141 is opened to a predetermined location, the door opening and closing detection part 144 may detect that the door has been opened. In addition, when the door arm 143 moves to a preset door closed location or the door 141 is opened to a predetermined location, the door opening and closing detection part 144 may detect that the door has been opened.

[0251] The door opening and closing detection part 144 may include a contact sensor. As an example, the door opening and closing detection part 144 may include a micro switch.

[0252] Meanwhile, the door opening and closing detection part 144 may include a non-contact sensor. As an example, the door opening and closing detection part 144 may include an IR sensor.

[0253] With this configuration, the door unit 140 may selectively open and close at least a portion of the coupling surface 121 to allow the outside of the first outer wall surface 112a to communicate with the flow path part 180 and/or the dust collection part 170.

[0254] The door unit 140 may be opened together when the discharge cover 222 of the cleaner 200 is opened. In addition, when the door unit 140 is closed, the discharge cover 222 of the cleaner 200 may be closed together by interworking with the door unit 140.

[0255] When the dust in the dust bin 220 of the cleaner 200 is removed, the door motor 142 may rotate the door 141 to couple the discharge cover 222 to the dust bin main body 221. Specifically, the door motor 142 may rotate the door 141, and the rotating door 141 may push the discharge cover 222 toward the dust bin main body 221.

[0256] The cover opening unit 150 according to the present disclosure will be described with reference to FIGS. 2, 7, and 8 as follows.

[0257] The cleaner station 100 according to the present disclosure may include the cover opening unit 150. The cover opening unit 150 may be disposed on the coupling part 120 to open the discharge cover 222 of the cleaner 200.

[0258] The cover opening unit 150 may include a push protrusion 151, a cover opening motor 152, a cover opening gear 153, a support plate 154, and a gear box 155.

[0259] The push protrusion 151 may move to press the coupling lever 222c when coupled to the cleaner 200.

[0260] The push protrusion 151 may be disposed on the dust bin guide surface 122. Specifically, the protrusion movement hole may be formed in the dust bin guide

surface 122, and the push protrusion 151 may pass through the protrusion movement hole and may be exposed to the outside.

[0261] The push protrusion 151 may be disposed at a location at which the coupling lever 222c may be pressed when coupled to the cleaner 200. That is, the coupling lever 222c may be disposed on the protrusion movement hole. In addition, the coupling lever 222c may be disposed on the movement region of the push protrusion 151.

[0262] The push protrusion 151 may make a linear reciprocating motion to press the coupling lever 222c. Specifically, the push protrusion 151 may be coupled to the gear box 155 to guide linear movement. The push protrusion 151 may be coupled to the cover opening gear 153 and moved together by the movement of the cover opening gear 153.

[0263] The cover opening motor 152 may provide power for moving the push protrusion 151. Specifically, the cover opening motor 152 may rotate a motor shaft (not shown) in the forward or reverse direction. Here, the forward direction may be a direction in which the push protrusion 151 presses the coupling lever 222c. In addition, the reverse direction may be a direction in which the push protrusion 151 pressing the coupling lever 222c is returned to an original location. The forward direction may be a direction opposite to the reverse direction.

[0264] The cover opening gear 153 may be coupled to the cover opening motor 152 to move the push protrusion 151 using the power of the cover opening motor 152. Specifically, the cover opening gear 153 may be accommodated inside the gear box 155. A driving gear 153a of the cover opening gear 153 may be coupled to the motor shaft of the cover opening motor 152 to receive power. A driven gear 153b of the cover opening gear 153 may be coupled to the push protrusion 151 to move the push protrusion 151. As an example, the driven gear 153b may be provided in the form of a rack gear, engaged with the driving gear 153a, and may receive power from the driving gear 153a.

[0265] In this case, the discharge cover 222 may be provided with a torsion spring (not shown). The discharge cover 222 may be rotated at a predetermined angle or more by an elastic force of the torsion spring (not shown) and supported at the rotated location. Therefore, the discharge cover 222 may be opened to allow the dust through hole 121a to communicate with the inside of the dust bin 220.

[0266] The gear box 155 may be provided inside the housing 110, disposed under the coupling part 120 in the direction of gravity, and may have the cover opening gear 153 accommodated therein.

[0267] The gear box 155 may be provided with a cover opening detection part 155f. In this case, the cover opening detection part 155f may include a contact sensor. As an example, the cover opening detection part 155f may include a micro switch. Meanwhile, the cover opening detection part 155f may also include a non-contact sen-

sor. As an example, the cover opening detection part 155f may include an IR sensor.

[0268] At least one cover opening detection part 155f may be disposed on an inner or outer surface of the gear box 155. As an example, one cover opening detection part 155f may be disposed on the inner surface of the gear box 155. In this case, the cover opening detection part 155f may detect that the push protrusion 151 is located at an initial location.

[0269] As another example, two cover opening detection parts 155f may be disposed on the outer surface of the gear box 155. In this case, the cover opening detection part 155f may detect the initial location of the push protrusion 151 and the cover opening location.

[0270] Therefore, according to the present disclosure, the cover opening part 150 may allow the user to open the dust bin 220 without separately opening the discharge cover 222 of the cleaner, thereby improving convenience.

[0271] In addition, since the discharge cover 222 is opened in a state in which the cleaner 200 is coupled to the cleaner station 100, it is possible to prevent the scattering of dust.

[0272] Meanwhile, the dust collection part 170 will be described with reference to FIGS. 2 and 8 as follows.

[0273] The cleaner station 100 may include the dust collection part 170. The dust collection part 170 may be disposed inside the housing 110. The dust collection part 170 may be disposed under the coupling part 120 in the direction of gravity.

[0274] As an example, the dust collection part 170 may refer to a dust bag for collecting dust sucked from the inside of the dust bin 220 of the cleaner 200 by the dust collection motor 191.

[0275] The dust collection part 170 may be detachably coupled to the housing 110.

[0276] Therefore, the dust collection part 170 may be separated from the housing 110 and discarded, and a new dust collection part 170 may be coupled to the housing 110. That is, the dust collection part 170 can be defined as a consumable part.

[0277] The dust bag may be provided so that when a suction force is generated by the dust collection motor 191, a volume increases to allow dust to be accommodated therein.

[0278] To this end, the dust bag may be made of a material that allows air to permeate the same but does not allow a foreign substance such as dust to permeate the same. As an example, the dust bag may be made of a non-woven material and may have a hexahedral shape based on when a volume is expanded.

[0279] Therefore, since the user does not need to separately tie a bag in which dust has been collected, user convenience can be improved.

[0280] Alternatively, the dust bag may be made of a permeable material. For example, the dust bag may include roll vinyl (not shown). With this configuration, when the dust bag is sealed or bonded, it is possible to prevent dust or odor collected inside the dust bag 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 shown). If necessary, the dust bag may be replaced through the dust bag cartridge.

5 **[0281]** Meanwhile, the flow path part 180 will be described with reference to FIGS. 2 and 6 as follows.

[0282] The cleaner station 100 may include the flow path part 180.

10 **[0283]** The flow path part 180 may connect the dust bin 220 of the cleaner 200 to the dust collection part 170. The flow path part 180 may be disposed behind the coupling surface 121. The flow path part 180 may refer to a space between the dust bin 220 of the cleaner 200 and the dust collection part 170. The flow path part 180 may be a space formed behind the dust through hole 121a and may be a flow path formed to be bent downward from the dust through hole 121a to flow dust and air.

[0284] Specifically, when the cleaner 200 is coupled to the cleaner station 100 to open the dust through hole 121a, the flow path part 180 may include the first suction flow path 181 communicating with the internal space of the dust bin 220, and the second suction flow path 182 communicating between the first suction flow path 181 and an internal space of the dust collection part 170.

25 **[0285]** As an example, the first suction flow path 181 may be disposed substantially parallel to the suction motor axis line a4 or the dust bin central axis a3 passing through the dust bin 220. In this case, the suction motor axis line a4 or the dust bin central axis a3 may pass through the first suction flow path 181.

30 **[0286]** In this case, the second suction flow path 182 may be formed at a predetermined angle with the first suction flow path 181. As an example, the first suction flow path 181 and the second suction flow path 182 may be formed at a right angle. With this configuration, it is possible to minimize the overall volume of the cleaner station 100.

[0287] The dust in the dust bin 220 of the cleaner 200 may be moved to the dust collection part 170 through the flow path part 180.

40 **[0288]** Meanwhile, the dust suction module 190 will be described with reference to FIGS. 2 and 8 as follows.

[0289] The cleaner station 100 may include the dust suction module 190. The dust suction module 190 may generate a suction airflow to allow the dust inside the dust bin 220 to be suctioned into the dust collection part 170 through the flow path part 180.

[0290] The dust suction module 190 may include the dust collection motor 191, a first filter 192, and a second filter (not shown).

50 **[0291]** The dust collection motor 191 may generate the suction airflow that suctiones the dust inside the dust bin 220 into the dust collection part. The dust collection motor 191 may be disposed under the dust collection part 170. The dust collection motor 191 may generate a suction force capable of suctioning the dust in the dust bin 220 of the cleaner 200, and thus the suction airflow may be provided to the dust bin 220.

[0292] The suction airflow generated by the dust collection motor 191 may be transmitted to the inside of the dust bin 220 along the flow path part 180 and the dust through hole 121a through the dust collection part 170, and the dust in the dust bin 220 may be discharged from the dust bin 220 to the dust through hole 121a along the flow of the suction airflow by the suction airflow and then collected in the dust collection part 170 through the flow path part 180.

[0293] The dust collection motor 191 may generate the suction force by rotation. As an example, the dust collection motor 191 may be formed in a shape similar to a cylinder.

[0294] Meanwhile, in the present specification, a virtual dust collection motor axis line extending the rotational axis of the dust collection motor 191 may be formed.

[0295] The first filter 192 may be disposed between the dust collection part 170 and the dust collection motor 191. The first filter 192 may be a pre-filter.

[0296] The second filter (not shown) may be disposed between the dust collection motor 191 and the outer wall surface 112. The second filter (not shown) may be a HEPA filter.

[0297] Meanwhile, the cleaner station 100 may further include a charging part 128. The charging part may be disposed on the coupling part 120. The charging part 128 may be electrically connected to the cleaner 200 coupled to the coupling part 120. The charging part 128 may supply power to the battery of the cleaner 200 coupled to the coupling part 120.

[0298] In addition, the cleaner station 100 may further include a side door (not shown). The side door may be disposed in the housing 110. The side door may selectively expose the dust collection part 170 to the outside. Therefore, the user can easily remove the dust collection part 170 from the cleaner station 100.

[0299] In addition, the cleaner station 100 may further include an exhaust port 162. The exhaust port 162 may be formed in the housing 110. For example, the exhaust port 162 may be formed at the lower side of the housing 110 and connected to the dust collection motor 191 through a flow path. Therefore, the air passing through the dust collection motor 191 may be discharged to the outside of the housing 110 through the exhaust port 162.

[0300] Meanwhile, an exhaust part 160 will be described with reference to FIG. 2 as follows.

[0301] The cleaner station 100 may further include the exhaust part 160.

[0302] The exhaust part 160 may guide the air discharged from the dust collection motor 191 to the outside of the housing 110. The exhaust part 160 may allow the internal space to communicate with the external space of the housing 110.

[0303] The exhaust part 160 may include an exhaust flow path 161. The air discharged from the dust collection motor 191 may flow through the exhaust flow path 161. The exhaust flow path 161 may provide a flow path through which the air discharged from the dust collection

motor 191 flows. The air flowing through the exhaust flow path 161 may be discharged to the outside of the housing 110 through the exhaust port 162. Specifically, one end of the exhaust flow path 161 may communicate with the internal space in which the dust collection motor 191 is accommodated of the dust suction module 190, and the other end of the exhaust flow path 161 may communicate with the exhaust port 162. As an example, the exhaust flow path 161 may be a flow path formed in a horizontal direction inside the housing 110, and the exhaust port 162 may allow the inside to communicate with the outside of the housing 110. One end portion of the exhaust flow path 161 may communicate with the dust suction module 190, and the other end portion of the exhaust flow path 161 may communicate with the exhaust port 162.

[0304] FIG. 9 is a side cross-sectional view of a cleaner system according to a first embodiment of the present disclosure, FIG. 10A is an enlarged view for specifically describing region A shown in FIG. 9, FIG. 10B is a view for describing an opened state of a second dust storage part shown in FIG. 10A, FIG. 11 is a perspective view for describing a lower surface of a dust bin of the cleaner according to the first embodiment of the present disclosure, FIG. 12A is a side cross-sectional view for specifically describing an opening and closing unit of the cleaner according to the first embodiment of the present disclosure, FIG. 12B is a side cross-sectional view showing an opened state of the second dust storage part shown in FIG. 12A, and FIG. 13 is a perspective view for describing a door of a cleaner station according to the first embodiment of the present disclosure.

[0305] A cleaner system 1 according to the first embodiment of the present disclosure will be described with reference to FIGS. 9 to 13 as follows.

[0306] The cleaner system 1 according to the first embodiment of the present disclosure may include an opening and closing unit 300.

[0307] The opening and closing unit 300 may selectively open and close the second dust storage part 215b depending on whether the suction airflow is generated. When the suction airflow is generated from the dust suction module 190, the opening and closing unit 300 may open the second dust storage part 215b. When no suction airflow is generated from the dust suction module 190, the opening and closing unit 300 may close the second dust storage part 215b.

[0308] When the suction airflow is generated from the dust suction module 190, the opening and closing unit 300 may allow the second dust storage part 215b to communicate with the flow path part 180. Specifically, when the dust suction module 190 generates the suction airflow in a state in which the cleaner 200 is coupled to the coupling part 120 of the cleaner station 100, the opening and closing unit 300 may allow the second dust storage part 215b to communicate with the first suction flow path 181.

[0309] According to an embodiment, when the suction airflow is supplied to the dust bin 220 from the outside, the

opening and closing unit 300 may allow the second dust storage part 215b to communicate with the external space of the dust bin 220.

[0310] The opening and closing unit 300 may include a guide member 310, a valve member 320, an elastic member 330, and a sealing member 340.

[0311] The guide member 310 is a component for guiding the movement of the valve member 320. The guide member 310 may extend in the longitudinal direction of the dust bin 220. At least a portion of the guide member 310 may be disposed inside the dust bin 220. Specifically, at least a portion of the guide member 310 may be disposed in the second dust storage part 215b.

[0312] The guide member 310 may include a guide bar 311 and a stopper 312.

[0313] The guide bar 311 may be formed to extend in the vertical direction. The guide bar 311 may be disposed in the vertical direction by passing through the valve member 320. Specifically, the guide bar 311 may be disposed in the vertical direction by passing through a locking part 321. A longitudinal axis of the guide bar 311 may match or may be parallel to the axis a2 of the cyclonic flow. The longitudinal axis of the guide bar 311 may match or may be parallel to the dust bin central axis a3. The longitudinal axis of the guide bar 311 may match or may be parallel to the suction motor axis line a4.

[0314] The guide bar 311 may be fixedly disposed inside the dust bin 220. Specifically, one end portion of the guide bar 311 may be fixed to the band member 213bc of the second cyclone part 213b. Specifically, an upper end portion of the guide bar 311 may be fixed to a central portion of the band member 213bc. The guide bar 311 may extend downward from the center of the band member 213bc. The guide bar 311 may be disposed inside a space formed by the outer circumferential surfaces of the plurality of cyclone bodies 213ba. In this case, the plurality of cyclone bodies 213ba may be disposed radially with respect to the guide bar 311.

[0315] Meanwhile, in the present specification, "above" may refer to a direction in which the suction motor 216 is disposed with respect to the second cyclone part 213b, and "under" may refer to a direction in which the second dust storage part 215b is disposed with respect to the second cyclone part 213b.

[0316] The stopper 312 may be disposed at the other end portion of the guide bar 311. Specifically, the stopper 312 may be disposed at a lower end portion of the guide bar 311. The stopper 312 may be provided to protrude from the lower end portion of the guide bar 311 and provided to protrude in a left-right direction. Therefore, when the valve member 320 moves a predetermined distance or more down, the stopper 312 may interfere with the locking part 321 of the valve member 320 to restrict the movement of the valve member 320.

[0317] The stopper 312 may be disposed inside the valve member 320. Specifically, the stopper 312 may be disposed inside a space in which an inner surface of the locking part 321 is formed. Therefore, when the suction

airflow is generated from the dust suction module 190 and the valve member 320 moves the predetermined distance or more, the stopper 312 may interfere with the inner surface of the locking part 321.

[0318] The valve member 320 may open the second dust storage part 215b when the suction airflow is generated. A lower portion of the second dust storage part 215b may be configured to be opened and may be selectively opened and closed by the valve member 320.

[0319] The valve member 320 may move in the vertical direction to open and close the dust outlet 215ba of the second dust storage part 215b. The valve member may move up to close the second dust storage part 215b and move down to open the second dust storage part 215b.

[0320] The dust outlet 215ba may be formed on a lower portion of the storage member 215. The dust outlet 215ba is a component for guiding the dust in the second dust storage part 215b to the flow path part 180. The dust outlet 215ba may be closed by the valve member 320, and when the suction airflow is generated from the dust suction module, the valve member 320 may open the dust outlet 215ba.

[0321] The valve member 320 may open a portion of the dust outlet 215ba when the suction airflow is generated from the dust suction module 190 (see FIG. 12B). Therefore, compared to a case where the dust outlet 215ba is fully opened, when the valve member 320 opens only a portion of the dust outlet 215ba, the suction airflow transferred to the second dust storage part 215b increases.

[0322] The valve member 320 may be disposed to move along the guide member 310. Specifically, the valve member 320 may be disposed to slidably move along the guide bar 311. The guide bar 311 may be disposed to pass through the valve member 320 and may support the vertical movement of the valve member 320.

[0323] The valve member 320 may include the locking part 321 and a sealing part 322.

[0324] The locking part 321 is a component interfering with the stopper 312 when the second dust storage part 215b is opened and may restrict the movement of the valve member 320. A hole through which the guide bar 311 may pass may be formed in the locking part 321. The locking part 321 may slidably move along the guide bar 311 passing through the hole.

[0325] The sealing part 322 may close a portion of the cover hole 222d in a state in which the discharge cover 222 is closed. The sealing part 322 may extend from the locking part 321. The sealing part 322 may be provided to protrude from an end portion of the locking part 321. The sealing part 322 may be moved up by the elastic force of the elastic member 330 to press the sealing member 340. In addition, the second dust storage part 215b may be closed in a state in which the sealing part 322 presses the sealing member 340.

[0326] The elastic member 330 may generate an elastic force in a direction in which the valve member 320 closes the second dust storage part 215b. One end

portion and the other end portion of the elastic member 330 may be connected to the guide member 310 and the valve member 320, respectively. Specifically, the one end portion of the elastic member 330 may be connected to the stopper 312 of the guide member 310, and the other end portion of the elastic member 330 may be connected to the locking part 321 of the valve member 320. The elastic member 330 may be disposed at the lower side of the valve member 320.

[0327] The elastic member 330 may be a spring. The elastic member 330 may be disposed along the guide member 310. The elastic member 330 may be formed to surround the guide member 310. Specifically, one end portion of the elastic member 330 may be fixedly coupled to the stopper 312, and the other end portion of the elastic member 330 may be fixedly coupled to the locking part 321.

[0328] Meanwhile, a cover hole 222d may be formed in the discharge cover 222 of the cleaner system 1 according to the first embodiment of the present disclosure. The cover hole 222d is a component for allowing the valve member 320 to pass therethrough when the discharge cover 222 is closed. Specifically, when the dust suction module 190 generates the suction airflow in a state in which the discharge cover 222 is closed, the valve member 320 may pass through the cover hole 222d.

[0329] The cover hole 222d may be formed in a central portion of the cover body 222a. In a state in which the discharge cover 222 is closed, the cover hole 222d may be formed at a location corresponding to the valve member 320 on the discharge cover 222.

[0330] A diameter of the cover hole 222d may be formed to be equal to or greater than a diameter of the valve member 320 so that the valve member 320 may pass through the cover hole 222d. Specifically, the diameter of the cover hole 222d may be formed to be greater than a diameter of the locking part 321.

[0331] When no suction airflow is generated from the dust suction module 190, the diameter of the cover hole 222d may be formed to be equal to a diameter of the sealing part 322 to prevent the scattering of dust to the outside.

[0332] Since the cover hole 222d is formed in the discharge cover 222, only the first dust storage part 215a may be closed when the discharge cover 222 is closed.

[0333] When the valve member 320 closes the second dust storage part 215b, the sealing member 340 may be disposed at the lower side of the storage member 215 to airtighten the second dust storage part 215b. With this configuration, when the dust suction module 190 does not generate the suction airflow, the valve member 320 may press the sealing member 340 by the elastic force of the elastic member 330, and the second dust storage part 215b may be sealed.

[0334] According to an embodiment, the sealing member 340 may be disposed along an inner circumferential surface of the cover hole 222d of the discharge cover

222.

[0335] Meanwhile, the dust outlet 215ba may be formed on a central portion of the sealing member 340. When the suction airflow is supplied to the second dust storage part 215b, the dust outlet 215ba may guide the air in the second dust storage part 215b to the cover hole 222d or the outside.

[0336] A diameter of the dust outlet 215ba may be formed to be smaller than the diameter of the cover hole 222d. The diameter of the dust outlet 215ba may be formed to be smaller than the diameter of the sealing part 322. The diameter of the dust outlet 215ba may be formed to be greater than the diameter of the locking part 321.

[0337] A door hole 141c may be formed in the door 141. When the suction airflow is generated from the dust suction module 190, the valve member 320 may pass through the door hole 141c.

[0338] A diameter of the door hole 141c may be formed to be greater than the diameter of the valve member 320 so that the valve member 320 may pass through the door hole 141c. Specifically, the diameter of the door hole 141c may be formed to be greater than the diameter of the sealing part 322.

[0339] In a state in which the second dust storage part 215b is closed, a portion of the locking part 321 may be disposed on the dust outlet 1215ba, and the sealing part 322 may be disposed in the cover hole 222d. In a state in which the second dust storage part 215b is opened, a portion of the locking part 321 may be disposed on the dust outlet 1215ba and the cover hole 222d, and the sealing part 322 may be disposed on the first suction flow path 181 after passing through the door hole 141c.

[0340] The dust suction module 190 may generate the suction airflow by driving the dust collection motor 191 in a state in which the discharge cover 222 and the door 141 are closed (see FIG. 10B).

[0341] Specifically, when the dust collection motor 191 is driven in a state in which the discharge cover 222 and the door 141 are closed, external air may flow into the space in which the suction motor 216 is accommodated through the air outlet of the air discharge cover 217. Thereafter, the air flowing into the space in which the suction motor 216 is accommodated may flow into the internal space 270a of the filter. Thereafter, the air flowing into the internal space 270a of the filter may pass through the filter 270 and flow into the external space 270b of the filter. Thereafter, the air flowing into the external space 270b of the filter may pass through the vortex finder 213bb and flow into the second cyclone body 213ba. Thereafter, the air flowing into the second cyclone body 213ba may flow into the second dust storage part 1215b. Thereafter, the air flowing into the second dust storage part 1215b may sequentially pass through the dust outlet 1215ba, the cover hole 222d, and the door hole 141c and flow into the first suction flow path 181.

[0342] That is, in the cleaner system according to the first embodiment of the present disclosure, when the dust

collection motor 191 is driven to generate the suction airflow, the air in the external space may sequentially pass through the air discharge cover 217, the suction motor 216, the filter 270, the second cyclone part 213b, the second dust storage part 215b, the cover hole 222d, the door hole 141c, and the flow path part 180 and flow into the dust collection part 170. In such a process, the dust accumulated in the filter 270 and the second cyclone part 213b may be collected in the dust collection part 170 along the suction airflow. In addition, since the suction airflow is supplied in a state in which the discharge cover 222 closes the first dust storage part 215a, a flow rate of the suction airflow transferred to the second dust storage part 215b can be increased compared to a state in which the first dust storage part 215a and the second dust storage part 215b are opened together.

[0343] Therefore, according to the present disclosure, by intensively transferring the suction airflow to the second dust storage part 215b in a state in which the first dust storage part 215a is closed, it is possible to effectively remove the dust accumulated in the second cyclone part 213b in addition to the inside of the cyclone body 213ba and/or the filter 270 disposed on the upper portion of the dust bin 220.

[0344] Meanwhile, the opening and closing unit 300 may be moved in the longitudinal direction of the dust bin 220. Specifically, the valve member 320 of the opening and closing unit 300 may be moved linearly along the dust bin central axis a3.

[0345] Referring to FIG. 12B, when the suction airflow is generated from the dust suction module 190, the valve member 320 may move along the dust bin central axis a3. In this case, the sealing part 322 of the valve member 320, which has closed the dust outlet 215ba, may be moved in an opening direction (direction of the dust bin central axis a3) of the dust outlet 215ba. When the valve member 320 is moved and the dust outlet 215ba is opened, the dust outlet 215ba and the cover hole 222d may be formed in an annular shape.

[0346] Therefore, all edge regions of the dust outlet 215ba may communicate with the first suction flow path 181 without interfering with a separate member. Therefore, the suction airflow generated from the dust suction module 190 may uniformly flow into the second dust storage part 215b through the edge regions of the dust outlet 215ba.

[0347] FIG. 14 is a side cross-sectional view for describing a cleaner system according to a second embodiment of the present disclosure, FIG. 15A is an enlarged view for specifically describing region B shown in FIG. 14, FIG. 15B is a view for describing an opened state of a second dust storage part shown in FIG. 15A, FIG. 16 is a perspective view for describing a lower surface of a dust bin of the cleaner according to the second embodiment of the present disclosure, FIG. 17 is a side cross-sectional view for describing a detailed configuration of the cleaner according to the second embodiment of the present disclosure, FIG. 18 is a perspective view for describing

a detailed configuration of an opening and closing unit according to the second embodiment of the present disclosure, FIG. 19 is a perspective view for describing a door of a cleaner station according to the second embodiment of the present disclosure, and FIG. 20 is a side cross-sectional view showing opened states of the door and a discharge cover in the cleaner system according to the second embodiment of the present disclosure.

[0348] A cleaner system 2 according to the second embodiment of the present disclosure will be described with reference to FIGS. 14 to 20 as follows.

[0349] The cleaner system 2 according to the second embodiment of the present disclosure may include a cleaning unit 1300 and a rotational unit 1400.

[0350] Meanwhile, to avoid overlapping description, the contents of the cleaner system according to the first embodiment of the present disclosure may be used for other configurations, except for those specifically stated in the second embodiment of the present disclosure.

[0351] That is, since the second embodiment of the present disclosure is the same as the first embodiment, except for the configuration and arrangement of the cleaning unit 1300, a storage member 1215, the door 141, and the rotational unit 1400, overlapping descriptions will be omitted, and differences therebetween will be mainly described.

[0352] The cleaning unit 1300 may clean the filter 270 by receiving the rotational force from the cleaner station 100. Specifically, the cleaning unit 1300 may be rotated by receiving a rotational force from a driving motor 1420 to be described below to clean the filter 270.

[0353] The cleaning unit 1300 may include a guide member 1310, a valve member 1320, an elastic member 1330, a cleaning member 1340, a coupling member 1350, and a discharge member 1360.

[0354] The guide member 1310 may guide the movement of the valve member 1320. The guide member 1310 may clean the filter 270 by rotating the cleaning member 1340.

[0355] At least a portion of the guide member 1310 may be rotatably disposed inside the dust bin 220. Specifically, at least a portion of the guide member 1310 may be rotatably disposed in the second dust storage part 1215b.

[0356] The guide member 1310 may extend in the longitudinal direction of the dust bin 220.

[0357] The guide member 310 may include a rotational bar 1311, a fixing part 1312, and a support part 1313.

[0358] The rotational bar 1311 may be formed to extend in the vertical direction. The guide bar 1311 may be disposed in the vertical direction by passing through the valve member 1320. A longitudinal axis of the rotational bar 1311 may match or may be parallel to the axis a2 of the cyclonic flow. The longitudinal axis of the rotational bar 1311 may match or may be parallel to the dust bin central axis a3. The longitudinal axis of the rotational bar 1311 may match or may be parallel to the suction motor axis line a4.

[0359] The rotational bar 1311 may be rotatably dis-

posed inside the dust bin 220. The second cyclone part 1213b may rotatably support one side of the rotational bar 1311. Specifically, the band member 213bc may rotatably support the one side of the rotational bar 1311. In addition, the other side of the rotational bar 1311 may be rotatably supported by a rotational support part 1360b. The rotational support part 1360b may extend from the discharge member 1360 to be described below.

[0360] The rotational bar 1311 may be arranged to pass through the central portion of the band member 213bc. The rotational bar 1311 may be disposed inside the space formed by the outer circumferential surfaces of the plurality of cyclone bodies 213ba. In this case, the plurality of cyclone bodies 213ba may be disposed radially with respect to the guide bar 1311.

[0361] The fixing part 1312 is a component to which the cleaning member 1340 is coupled. The cleaning member 1340 may be fixed to the inside of the fixing part 1312. Specifically, a plurality of fixing parts 1312 are disposed at the upper end portion of the guide bar 1311. The fixing part 1312 may be provided to protrude from the upper end portion of the guide bar 1311. The fixing part 1312 may be formed to be bent at least once.

[0362] The fixing part 1312 may be formed to correspond to the surface of the filter 270. The cleaning member 1340 is coupled to the inside of the fixing part 1312, and the cleaning member 1340 may sweep the surface of the filter 270 while rotating together with the fixing part 1312. In this case, rotational central axes of the fixing part 1312 and the cleaning member 1340 may match the longitudinal axis of the rotational bar 1311.

[0363] The support part 1313 is a component for supporting the fixing part 1312 to rotate stably. The support part 1313 may be disposed along a rotation radius of the fixing part 1312. The support part 1313 may be formed in a ring shape. The support part 1313 may be formed to match the rotational radius of the fixing part 1312.

[0364] The valve member 1320 may open the second dust storage part 1215b when the suction airflow is generated. The lower portion of the second dust storage part 1215b may be configured to be opened and may be selectively opened and closed by the valve member 1320.

[0365] Meanwhile, the lower portion of the storage member 1215 of the cleaner system 2 according to the second embodiment of the present disclosure may have a lower height than the lower portion of the dust bin 220. Referring to FIG. 17, although it can be seen that the lower end of the dust bin 220 of the cleaner system 2 according to the second embodiment of the present disclosure protrudes downward more than the lower end of the storage member 1215, it can be seen that this is not the case in the cleaner system 1 according to the first embodiment.

[0366] The valve member 1320 may move in the vertical direction to open and close the dust outlet 1215ba of the second dust storage part 1215b. The valve member may move up to close the second dust storage part 1215b

and move down to open the second dust storage part 1215b.

[0367] Specifically, the dust outlet 1215ba may be formed on the lower portion of the second dust storage part 1215b. In this case, the dust outlet 1215ba may be closed by the valve member 1320, and when the suction airflow is generated from the dust suction module 190, the valve member 1320 may open the dust outlet 1215ba.

[0368] The valve member 1320 may be disposed to move along the guide member 1310. Specifically, the valve member 1320 may be disposed to slidably move along the rotational bar 1311. The rotational bar 1311 may be disposed to pass through the valve member 1320 to support the vertical movement of the valve member 1320.

[0369] The elastic member 1330 may generate an elastic force in a direction in which the valve member 1320 closes the second dust storage part 1215b. One end portion and the other end portion of the elastic member 1330 may be connected to the guide member 1310 and the valve member 1320, respectively. Specifically, the one end portion of the elastic member 1330 may be connected to the rotational bar 1311, and the other end portion may be connected to the valve member 1320. In addition, according to an embodiment, the elastic member 1330 may be disposed along the rotational bar 1311, the one end portion of the elastic member 1330 may be connected to the rotational support part 1360b, and the other end portion of the elastic member 1330 may be connected to the valve member 1320.

[0370] The elastic member 1330 may be a spring. The elastic member 1330 may be disposed along the guide member 1310. The elastic member 1330 may be formed to surround the rotational bar 1311. Specifically, the one end portion of the elastic member 1330 may be fixedly coupled to the stopper 1312, and the other end portion of the elastic member 1330 may be fixedly coupled to the rotational bar 1311 or the rotational support part 1360b.

[0371] The cleaning member 1340 may clean the filter 270 while rotating together with the guide member 1310. The cleaning member 1340 may be disposed inside the fixing part 1312. The cleaning member 1340 may be formed to correspond to the surface of the filter 270. The cleaning member 1340 may be a brush. When the rotational bar 1311 of the guide member 1310 rotates, the cleaning member 1340 may sweep the dust accumulated on the surface of the filter 270 while rotating together with the fixing part 1312 connected to the rotational bar 1311.

[0372] The guide member 1310 may include the coupling member 1350. The coupling member 1350 may be a component of the guide member 1310.

[0373] When the door 141 is closed, one side of the guide member 1310 may be coupled to the rotational unit 1400. Specifically, when the door 141 is closed, the coupling member 1350 disposed at the one side of the guide member 1310 may be coupled to the rotational unit 1400.

[0374] The coupling member 1350 may be disposed at

one end portion of the rotational bar 1311. The coupling member 1350 may be coupled to the rotational unit 1400 when the door 141 is closed. Specifically, the coupling member 1350 may be coupled to a rotor 1410 of the rotational unit 1400 when the door 141 is closed.

[0375] A coupling groove 1350a may be formed in the coupling member 1350. In this case, the rotor 1410 of the rotational unit 1400 may be formed to correspond to the coupling groove 1350a. Therefore, when the door 141 is closed, the rotor 1410 disposed in front of the door 141 may be fitted into the coupling groove 1350a.

[0376] The discharge member 1360 is a component for guiding the dust discharged through the dust outlet 1215ba of the second dust storage part 1215b to the flow path part 180 and may be disposed inside the dust bin 220.

[0377] The discharge member 1360 may partition the internal space of the dust bin 220 into the first dust storage part 1215a and a discharge flow path 1360a. That is, the internal space of the dust bin 220 may be partitioned into the first dust storage part 1215a, the discharge flow path 1360a, and the second dust storage part 1215b by the storage member 1215 and the discharge member 1360.

[0378] The discharge member 1360 may be disposed under the storage member 1215. The discharge member 1360 may extend from the storage member 1215. In this case, the discharge flow path 1360a formed by the internal space of the discharge member 1360 may communicate with the cover hole 222d.

[0379] In a state in which the door 141 is closed, the discharge flow path 1360a may communicate with the second dust storage part 1215b and the door hole 141c. Specifically, in a state in which the discharge cover 222 and the door 141 are closed, the dust discharged from the second dust storage part 1215b may pass through the discharge flow path 1360a, the cover hole 222d, and the door hole 141c and flow into the flow path part 180.

[0380] Meanwhile, the cover hole 222d may be formed in the discharge cover 222. The cover hole 222d may be formed in a central portion of the discharge cover 222. Therefore, even when the discharge cover 222 is closed, only the first dust storage part 1215a may be closed. When the discharge cover 222 is closed, at least a portion of the coupling member 1350 may be disposed in the cover hole 222d.

[0381] When the suction airflow is generated from the dust suction module 190, the air in the second dust storage part 1215b may pass through the discharge flow path 1360a, the cover hole 222d, and the door hole 141c and flow into the first suction flow path 181. The diameter of the cover hole 222d may be formed to be greater than the diameter of the coupling member 1350.

[0382] Meanwhile, the cleaner station of the cleaner system 2 according to the second embodiment of the present disclosure may include the rotational unit 1400.

[0383] The rotational unit 1400 may be disposed on the door 141 to rotate the cleaning unit 1300 in a state in

which the door 141 is closed.

[0384] The rotational unit 1400 may include the rotor 1410 and the driving motor 1420.

[0385] The rotor 1410 may be coupled to the cleaning unit 1300 when the door 141 closes the dust through hole 121a. At least a portion of the rotor 1410 may be disposed in front of the door 141. The rotor 1410 may rotate about the longitudinal axis of the guide member 1310 in a state in which the door 141 is closed. Specifically, the rotor 1410 may rotate about the longitudinal axis of the dust bin 220 in a state in which the door 141 is closed.

[0386] The door hole 141c may be formed in the door 141. The door hole 141c may guide the dust in the second dust storage part 1215b to the flow path part 180 when the suction airflow is generated in a state in which the door 141 is closed.

[0387] When the suction airflow is generated in a state in which the cleaner 200 is coupled to the coupling part 120, the door hole 141c may communicate with the cover hole 222d. When the dust collection motor 191 is driven in a state in which the door 141 is closed to generate the suction airflow, the valve member 320 may pass through the door hole 141c, and at least a portion of the valve member 320 may be disposed on the first suction flow path 181.

[0388] The rotor 1410 may be disposed to pass through the door hole 141c so that at least a portion protrudes forward from the door 141. The diameter of the door hole 141c may be formed to be greater than a diameter of the rotor 1410. Therefore, when the suction force is generated from the dust suction module 190, the air in the second dust storage part 1215b may pass through the door hole 141c.

[0389] The driving motor 1420 may provide a rotational force to the rotor 1410. The driving motor 1420 may be disposed behind the door 141. In this case, the dust suction module 190 may generate the suction airflow after the driving motor 1420 is driven. Specifically, when the driving motor 1420 is driven and the cleaning member 1340 sweeps the dust accumulated on the filter 270 while rotating, the dust collection motor 191 is then driven to allow the dust swept from the filter 270 to be suctioned into the dust collection part 170.

[0390] The cleaner system 2 according to the second embodiment of the present disclosure may generate the suction airflow by driving the dust collection motor 191 in a state in which the discharge cover 222 and the door 141 are closed (see FIG. 15B). In this case, the dust collection motor 191 may be driven after the driving of the driving motor 1420 of the rotational unit 1400 is finished.

[0391] Specifically, when the driving motor 1420 of the rotational unit 1400 is driven in a state in which the door 141 is closed, the rotor 1410 may be rotated, and when the rotational unit 1400 coupled to the rotor 1410 is rotated, the cleaning member 1340 may sweep the dust accumulated on the outer surface of the filter 270. Thereafter, when the dust collection motor 191 is driven in a state in which the discharge cover 222 and the door 141

are closed, external air may flow into the space in which the suction motor 216 is accommodated through the air outlet of the air discharge cover 217. Thereafter, the air flowing into the space in which the suction motor 216 is accommodated may flow into the internal space 270a of the filter. Thereafter, the air flowing into the internal space 270a of the filter may pass through the filter 270 and flow into the external space 270b of the filter. Thereafter, the air flowing into the external space 270b of the filter may pass through the vortex finder 213bb and flow into the second cyclone body 213ba. Thereafter, the air flowing into the second cyclone body 213ba may flow into the second dust storage part 1215b. Thereafter, the air flowing into the second dust storage part 1215b may pass through the dust outlet 1215ba and flow into the discharge flow path 1360a. Thereafter, the air flowing into the discharge flow path 1360a may sequentially pass through the cover hole 222d and the door hole 141c and flow into the first suction flow path 181.

[0392] That is, in the cleaner system according to the first embodiment of the present disclosure, when the dust collection motor 191 is driven to generate the suction airflow, the air in the external space may sequentially pass through the air discharge cover 217, the suction motor 216, the filter 270, the second cyclone part 213b, the second dust storage part 1215b, the discharge flow path 1360a, the cover hole 222d, the door hole 141c, and the flow path part 180 and flow into the dust collection part 170. In such a process, the dust accumulated in the filter 270 and the second cyclone part 213b may be collected in the dust collection part 170 along the suction airflow. In addition, since the suction airflow is supplied in a state in which the discharge cover 222 closes the first dust storage part 1215a, a flow rate of the suction airflow transferred to the second dust storage part 1215b can be increased compared to a state in which the first dust storage part 1215a and the second dust storage part 1215b are opened together.

[0393] FIG. 21 is a side cross-sectional view of a cleaner system according to a third embodiment of the present disclosure, FIG. 22A is an enlarged view for specifically describing region C shown in FIG. 21, and FIG. 22B is a view for describing an opened state of a second dust storage part shown in FIG. 22A.

[0394] A cleaner system 3 according to the third embodiment of the present disclosure will be described with reference to FIGS. 21 to 22B as follows.

[0395] The cleaner system 3 according to the third embodiment of the present disclosure may include a cleaning unit 2300 and a rotational unit 2400.

[0396] Meanwhile, to avoid overlapping description, the contents of the cleaner system 2 according to the second embodiment of the present disclosure may be used for other configurations, except for those specifically stated in the third embodiment of the present disclosure.

[0397] That is, since the cleaner system 3 according to the third embodiment of the present disclosure is the

same as the cleaner system 2 according to the second embodiment of the present disclosure, except for the configuration and arrangement of the rotational unit 2400, overlapping descriptions will be omitted, and differences therebetween will be mainly described.

[0398] The rotational unit 2400 according to the third embodiment of the present disclosure may be disposed inside the housing 110 to rotate the cleaning unit 1300 in a state in which the door 141 is opened.

[0399] The rotational unit 1400 may include a hinge member 2410, a rotor 2420, and a driving motor (not shown).

[0400] The hinge member 2410 is a component for coupling the rotor 2420 to the cleaning unit 1300. The hinge member 2410 may be rotatably installed inside the housing 110. When the hinge member 2410 is rotated toward the dust through hole 121a in a state in which the door 141 is opened, the rotor 2420 may be coupled to the coupling member 1350 of the cleaning unit 1300.

[0401] The rotor 2420 may be disposed on the hinge member 2410. The rotor 2420 may be coupled to the cleaning unit 1300 when the hinge member 2410 rotates toward the dust through hole 121a. The rotor 2420 may rotate about the longitudinal axis of the rotational bar 1311 in a state of being coupled to the coupling member 1350 of the cleaning unit 1300.

[0402] A driving motor (not shown) may provide a rotational force to the rotor 2420. The driving motor (not shown) may be disposed on the hinge member 2410 or disposed inside the housing 110. In this case, the dust suction module 190 may generate the suction airflow after the driving motor is driven. Specifically, when the driving motor is driven and the cleaning member 1340 sweeps the dust accumulated on the filter 270 while rotating, the dust collection motor 191 is then driven to allow the dust swept from the filter 270 to be suctioned into the dust collection part 170.

[0403] Unlike the cleaner system according to the second embodiment of the present disclosure, there is a difference in that the rotational unit 2400 of the cleaner system 3 according to the third embodiment of the present disclosure may be coupled to the cleaning unit 1300 in a state in which the door 141 is opened.

[0404] The cleaner system 3 according to the third embodiment of the present disclosure may transfer the suction airflow to the second dust storage part 1215b by driving the dust collection motor in a state in which the discharge cover 222 is closed (see FIG. 22B).

[0405] Specifically, when the dust collection motor 191 is driven in a state in which the discharge cover 222 and the door 141 are closed, external air may flow into the space in which the suction motor 216 is accommodated through the air outlet of the air discharge cover 217. Thereafter, the air flowing into the space in which the suction motor 216 is accommodated may flow into the internal space 270a of the filter. Thereafter, the air flowing into the internal space 270a of the filter may pass through the filter 270 and flow into the external space 270b of the

filter. Thereafter, the air flowing into the external space 270b of the filter may pass through the vortex finder 213bb and flow into the second cyclone body 213ba. Thereafter, the air flowing into the second cyclone body 213ba may flow into the second dust storage part 1215b. Thereafter, the air flowing into the second dust storage part 1215b may pass through the dust outlet 1215ba and flow into the discharge flow path 1360a. Thereafter, the air flowing into the discharge flow path 1360a may sequentially pass through the cover hole 222d and the door through hole 121a and flow into the first suction flow path 181.

[0406] That is, in the cleaner system 3 according to the third embodiment of the present disclosure, when the dust collection motor 191 is driven to generate the suction airflow, the air in the external space may sequentially pass through the air discharge cover 217, the suction motor 216, the filter 270, the second cyclone part 213b, the second dust storage part 1215b, the discharge flow path 1360a, the cover hole 222d, the door through hole 121a, and the flow path part 180 and flow into the dust collection part 170. In such a process, the dust accumulated in the filter 270 and the second cyclone part 213b may be collected in the dust collection part 170 along the suction airflow. In addition, since the suction airflow is supplied in a state in which the discharge cover 222 closes the first dust storage part 1215a, a flow rate of the suction airflow transferred to the second dust storage part 1215b can be increased compared to a state in which the first dust storage part 1215a and the second dust storage part 1215b are opened together.

[0407] Meanwhile, FIG. 8 shows a block diagram for describing a control configuration of the cleaner system according to the embodiment of the present disclosure.

[0408] The control configuration of the cleaner system 10 according to the present disclosure will be described with reference to FIG. 8 as follows.

[0409] The cleaner system 10 according to the embodiment of the present disclosure may include further a controller 400 for controlling the coupling part 120, the fixing unit 130, the door unit 140, the cover opening unit 150, the dust collection part 170, the dust suction module 190, the suction motor 216, the manipulation part 219, and the battery 240.

[0410] The controller 400 may be composed of a printed circuit board and elements mounted on the printed circuit board.

[0411] The controller 400 may be classified into a station controller 401 for controlling the cleaner station 100 and a cleaner controller 402 for controlling the cleaner 200. The station controller 401 and the cleaner controller 402 may communicate with each other to exchange information or process data. Hereinafter, unless there is a special limitation, the station controller 401 and the cleaner controller 402 are collectively referred to as the controller 400.

[0412] When the coupling sensor 125 detects the coupling of the cleaner 200, the coupling sensor 125 may

transmit a signal indicating that the cleaner 200 has been coupled to the coupling part 120. In this case, the controller 400 may receive the signal of the coupling sensor 125 and determine that the cleaner 200 has been coupled to the coupling part 120.

[0413] In addition, when the charging part 128 supplies power to the battery 240 of the cleaner 200, the controller 400 may determine that the cleaner 200 has been coupled to the coupling part 120.

[0414] When the controller 400 determines that the cleaner 200 has been coupled to the coupling part 120, the controller 400 may fix the cleaner 200 by operating the fixing unit motor 133.

[0415] When the fixing member 131 or the fixing unit link (not shown) moves to a predetermined fixing point, the fixing detection part 137 may transmit a signal indicating that the cleaner 200 has been fixed. The station controller 400 may receive the signal indicating that the cleaner 200 has been fixed from the fixing detection part 137 and determine that the cleaner 200 has been fixed. When it is determined that the cleaner 200 has been fixed, the station controller 400 may stop the operation of the fixing unit motor 133.

[0416] Meanwhile, when the emptying of the dust bin 220 is finished, the controller 400 may release the fixing of the cleaner 200 by rotating the fixing unit motor 133 in the reverse direction.

[0417] When it is determined that the cleaner 200 has been fixed to the coupling part 120, the controller 400 may open the door 141 of the cleaner station 100 by operating the door motor 142.

[0418] The door opening and closing detection part 144 may transmit a signal indicating that the door 141 has been opened when the door 141 or the door arm 143 reaches a predetermined opening location. The controller 400 may receive the signal indicating that the door 141 has been opened from the door opening and closing detection part 137 and determine that the door 141 has been opened. When it is determined that the door 141 has been opened, the controller 400 may stop the operation of the door motor 142.

[0419] Meanwhile, when the emptying of the dust bin 220 is finished, the controller 400 may close the door 141 by rotating the door motor 142 in the reverse direction.

[0420] When it is determined that the door 141 has been opened, the controller 400 may open the discharge cover 222 of the cleaner 200 by operating the cover opening motor 152.

[0421] The cover opening detection part 155f may transmit a signal indicating that the discharge cover 222 has been opened when a guide frame 151e reaches a predetermined opening location. The controller 400 may receive the signal indicating that the discharge cover 222 has been opened from the cover opening detection part 155f and determine that the discharge cover 222 has been opened. When it is determined that the discharge cover 222 has been opened, the controller 400 may stop the operation of the cover opening motor 152.

[0422] The controller 400 may suction the dust inside the dust bin 220 by driving the dust collection motor 191.

[0423] The controller 400 may display a dust bin emptying state and charging state of the cleaner 200 by operating the display part 410.

[0424] Meanwhile, the cleaner station 100 according to the present disclosure may include the display part 410.

[0425] The display part 410 may be disposed not only in the housing 110, but also in a separate display device and provided in a terminal such as a mobile phone.

[0426] The display part 410 may include at least any 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 state, remaining time, etc. of a current ongoing stroke through the information output through the display part.

[0427] Meanwhile, the cleaner station 100 according to the embodiment of the present disclosure may include a memory 430. The memory 430 may include various pieces of data for driving and operating the cleaner station 100.

[0428] Meanwhile, the cleaner station 100 according to the embodiment of the present disclosure may include an input part 440. The input part 440 generates key input data that the user inputs to control the operation of the cleaner station 100. To this end, the input part 440 may be composed of 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 part 410, this may be referred to as a touch screen.

[0429] Although the present disclosure has been described in detail through specific embodiments, this is intended to specifically describe the present disclosure, and it is apparent that the present disclosure is not limited thereto, and the present disclosure can be modified or improved by those skilled in the art without departing from the technical spirit of the present disclosure.

[0430] All simple modifications or changes of the present disclosure fall within the scope of the present disclosure, and the specific scope of the present disclosure will be made clear by the appended claims.

Claims

1. A cleaner system comprising:

a cleaner (200) including a dust bin (220), and a suction part (212) configured to guide external air including dust to an inside of the dust bin (220); and

a cleaner station (100) including a housing (110) in which a coupling part (120) to which the cleaner (200) is coupled is disposed, a dust collection part (170) configured to collect dust inside the dust bin (220), a flow path part (180) configured to connect a dust bin through hole (121a) formed in the coupling part (120) to the

dust collection part (170), and a dust suction module (190) configured to generate a suction airflow so that the dust inside the dust bin (220) is suctioned into the dust collection part (170) through the flow path part (180), wherein the cleaner (200) includes:

a first cyclone part (213a) configured to separate dust from air introduced from the suction part (212);

a second cyclone part (213b) configured to separate dust from air passing through the first cyclone part (213a);

a storage member (215, 1215) configured to partition a space inside the dust bin (220) into a first dust storage part (215a, 1215a) in which the dust separated from the first cyclone part (213a) is stored, and a second dust storage part (215b, 1215b) in which the dust separated from the second cyclone part (213b) is stored; and

an opening and closing unit (300) moved in a longitudinal direction of the dust bin (220) and selectively opening and closing the second dust storage part (215b, 1215b) depending on whether the suction airflow is generated.

2. The cleaner system of claim 1, wherein the opening and closing unit (300) includes:

a guide member (310) extending the longitudinal direction of the dust bin (220);

a valve member (320) disposed to move along the guide member (310) and open the second dust storage part (215b, 1215b) when the suction airflow is generated; and

an elastic member (330) connected to each of the guide member (310) and the valve member (320) and generating an elastic force in a direction the valve member (320) closes the second dust storage part (215b, 1215b).

3. The cleaner system of claim 2, wherein, when the suction airflow is generated, the valve member (320) opens a portion of a dust outlet (215ba, 1215ba) formed on the storage member (215, 1215).

4. The cleaner system of claim 2, wherein the dust bin (220) includes:

a dust bin main body (221) having the first dust storage part (215a, 1215a) and the second dust storage part (215b, 1215b) disposed therein; and

a discharge cover (222) rotatably coupled to the dust bin main body (221) to open and close the first dust storage part (215a, 1215a).

5. The cleaner system of claim 4, wherein a cover hole (222d) through which the valve member (320) passes when the suction airflow is generated is formed in the discharge cover (222).
6. The cleaner system of claim 5, wherein the cleaner station (100) includes a door (141) coupled to the housing (110) to open and close the dust through hole (121a), and
a door hole (141a) through which the valve member (320) passes when the suction airflow is generated is formed in the door (141).
7. The cleaner system of claim 6, wherein the dust suction module (190) generates the suction airflow in a state in which the discharge cover (222) and the door (141) are closed.
8. A cleaner system comprising:
a cleaner (200) including a dust bin (220), and a suction part (212) configured to guide external air including dust to an inside of the dust bin (220); and
a cleaner station (100) including a housing (110) in which a coupling part (120) to which the cleaner (200) is coupled is disposed, a dust collection part (170) configured to collect dust inside the dust bin (220), a flow path part (180) configured to connect a dust bin through hole (121a) formed in the coupling part (120) to the dust collection part (170), and a dust suction module (190) configured to generate a suction airflow so that the dust inside the dust bin (220) is suctioned into the dust collection part (170) through the flow path part (180),
wherein the cleaner (200) includes:
a first cyclone part (213a) configured to separate dust from air introduced from the suction part (212);
a second cyclone part (213b) configured to separate dust from air passing through the first cyclone part (213a);
a storage member (215, 1215) configured to partition a space inside the dust bin (220) into a first dust storage part (215, 1215a) in which the dust separated from the first cyclone part (213a) is stored, and a second dust storage part (215b, 1215b) in which the dust separated from the second cyclone part (213b) is stored;
a filter (270) configured to separate dust from air passing through the second cyclone part (213b); and
a cleaning unit (400) configured to receive a rotational force from the cleaner station (100) and clean the filter (270).
9. The cleaner system of claim 8, wherein the cleaner station (100) includes:
a door (141) coupled to the housing (110) to open and close the dust through hole (121a); and
a rotational unit (410) disposed on the door (141) and rotating the cleaning unit (400) in a state in which the (141) is closed.
10. The cleaner system of claim 9, wherein the cleaning unit (400) includes:
a guide member (411) having at least a portion rotatably disposed inside the dust bin (220) and one side coupled to the rotational unit when the door (141) is closed; and
a cleaning member (412) disposed at the other side of the guide member (411) and rotating together with the guide member (411).
11. The cleaner system of claim 10, wherein the cleaner (200) further includes a dust bin longitudinal axis (a3) extending in the longitudinal direction of the dust bin (220), and
the rotational unit (410) rotates about the dust bin longitudinal axis (a3) in the state in which the door (141) is closed.
12. The cleaner system of claim 9, wherein a door hole (141b) configured to guide dust in the second dust storage part (215b, 1215b) to the flow path part (180) when the suction airflow is generated in the state in which the door (141) is closed is formed in the door (141).
13. The cleaner system of claim 12, wherein the cleaner (200) further includes a discharge flow path (350) configured to allow the second dust storage part (215b, 1215b) to communicate with the door hole (141b).
14. The cleaner system of claim 9, wherein the rotational unit (410) includes:
a rotor (413) having at least a portion disposed in front of the door (141) and coupled to the cleaning unit (400); and
a driving motor (414) disposed behind the door (141) and providing a rotational force to the rotor (413).
15. The cleaner system of claim 14, wherein the dust suction module (190) generates the suction airflow after the driving motor (414) is driven.
16. The cleaner system of claim 9, wherein the dust bin (220) includes:

a dust bin main (221) body having the first dust storage part (215a, 1215a) and the second dust storage part (215a, 1215a) disposed therein; and
 a discharge cover (222) rotatably coupled to the dust bin main body (221) to open and close the first dust storage part (215a, 1215a).

17. The cleaner system of claim 16, wherein the dust suction module (190) generates the suction airflow in a state in which the discharge cover (222) and the door (141) are closed.

18. The cleaner system of claim 8, wherein the cleaner station (100) includes:

a door (141) coupled to the housing (110) to open and close the dust through hole (121a); and
 a rotational unit (420) disposed inside the housing (110) and rotating the cleaning unit (400) in a state in which the door (141) is opened.

19. The cleaner system of claim 18, wherein the rotational unit (420) includes:

a hinge member (421) rotatable installed inside the housing (110);
 a rotor (422) disposed on the hinge member (421) and coupled to the cleaning unit (400) when the hinge member (421) rotates toward the dust bin through hole (121a); and
 a driving motor (423) configured to provide a rotational force to the rotor (422).

20. A cleaner (200) comprising:

a dust bin (220);
 a suction part (212) configured to guide external air including dust to an inside of the dust bin (220);
 a first cyclone part (213a) configured to separate dust from air introduced from the suction part (212);
 a second cyclone part (213b) configured to separate dust from air passing through the first cyclone part (213a);
 a storage member (215, 1215) configured to partition a space inside the dust bin (220) into a first dust storage part (215a, 1215a) in which the dust separated from the first cyclone part (213a) is stored, and a second dust storage part (215b, 1215b) in which the dust separated from the second cyclone part (213b) is stored;
 a guide member (310) having at least a portion disposed inside the dust bin (220);
 a valve member (320) disposed to move along the guide member (310) to open and close the

second dust storage part (215b, 1215b); and
 an elastic member (330) connected to each of the guide member (310) and the valve member (320) and generating an elastic force in a direction the valve member (320) closes the second dust storage part (215b, 1215b).

21. A cleaner (200) comprising:

a dust bin (220);
 a suction part (212) configured to guide external air including dust to an inside of the dust bin (220);
 a first cyclone part (213a) configured to separate dust from air introduced from the suction part (212);
 a second cyclone part (213b) configured to separate dust from air passing through the first cyclone part (213a);
 a storage member (215, 1215) configured to partition a space inside the dust bin (220) into a first dust storage part (215a, 1215a) in which the dust separated from the first cyclone part (213a) is stored, and a second dust storage part (215b, 1215b) in which the dust separated from the second cyclone part (213b) is stored;
 a filter (270) configured to separate dust from air passing through the second cyclone part (213b);
 a guide member (411) having at least a portion rotatably disposed inside the dust bin (220); and
 a cleaning member (412) disposed at one side of the guide member (411) and cleaning the filter (270) while rotating together with the guide member (411).

22. A cleaner system comprising:

a cleaner (200) including a dust bin (220), a suction part (212) configured to guide external air including dust to an inside of the dust bin (220), and a suction motor (216) configured to provide a suction airflow to the suction part (212);
 a cleaner station (100) including a housing (110) in which a coupling part (120) to which the cleaner (200) is coupled is disposed, a dust collection part (170) configured to collect dust inside the dust bin (220), a flow path part (180) configured to connect a dust bin through hole (121a) formed in the coupling part (120) to the dust collection part (170), and a dust suction module (190) configured to generate a suction airflow so that the dust inside the dust bin (220) is suctioned into the dust collection part (170) through the flow path part (180); and
 a virtual suction motor axis line (a4) extending a rotational axis of the suction motor (216), wherein the cleaner (200) includes:

a first cyclone part (213a) configured to separate dust from air introduced from the suction part (212);
a second cyclone part (213b) configured to separate dust from air passing through the first cyclone part (213a);
a storage member (215, 1215) configured to partition a space inside the dust bin (220) into a first dust storage part (215a, 1215a) in which the dust separated from the first cyclone part (213a) is stored, and a second dust storage part (215b, 1215b) in which the dust separated from the second cyclone part (213b) is stored;
a filter (270) configured to separate dust from air passing through the second cyclone part (213b); and
an opening and closing unit (300) moved in a longitudinal direction of the dust bin (220) and selectively opening and closing the second dust storage part (215b, 1215b) depending on whether the suction airflow is generated, and
the filter (270) and the second cyclone part (213b) are disposed in a vertical direction along the suction motor axis line (a4).

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FIG. 1

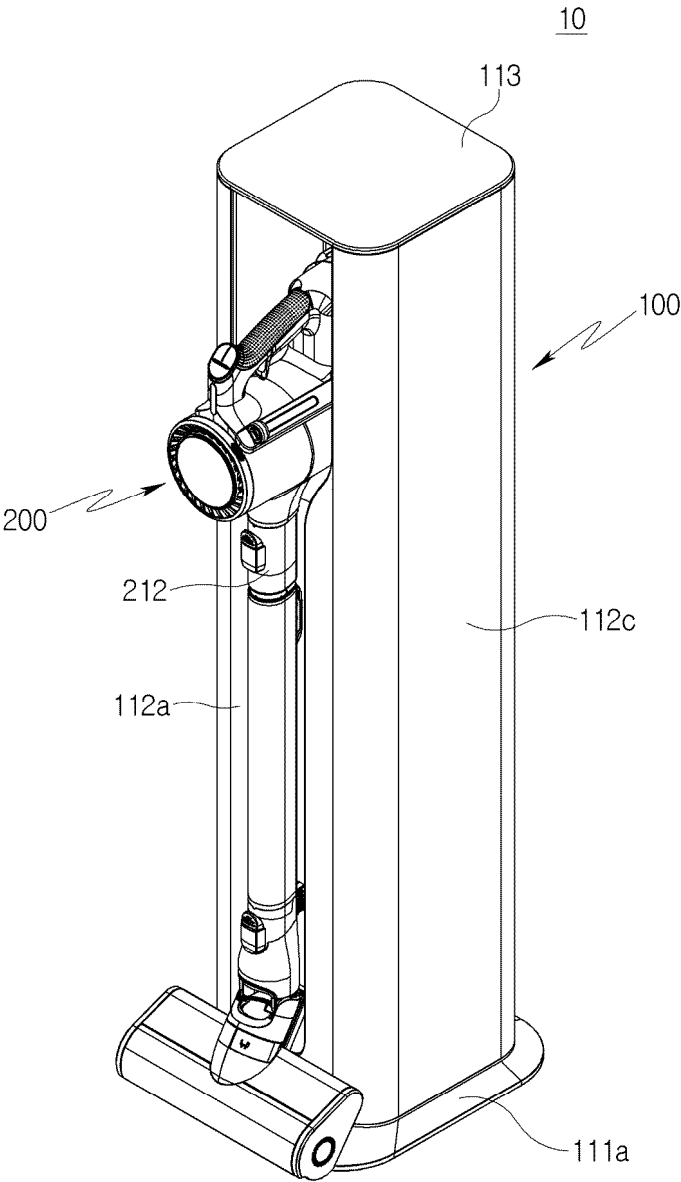


FIG. 2

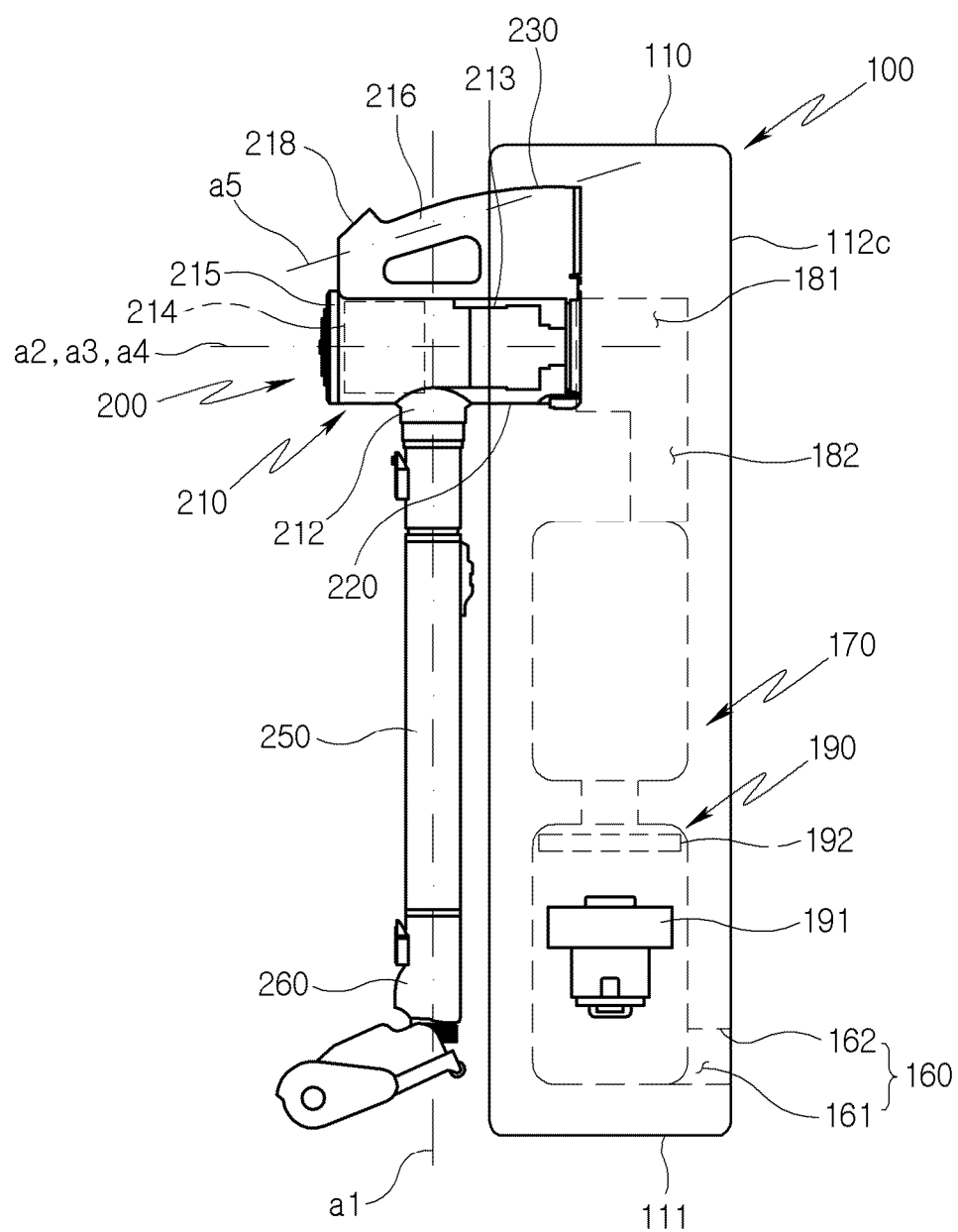


FIG. 3

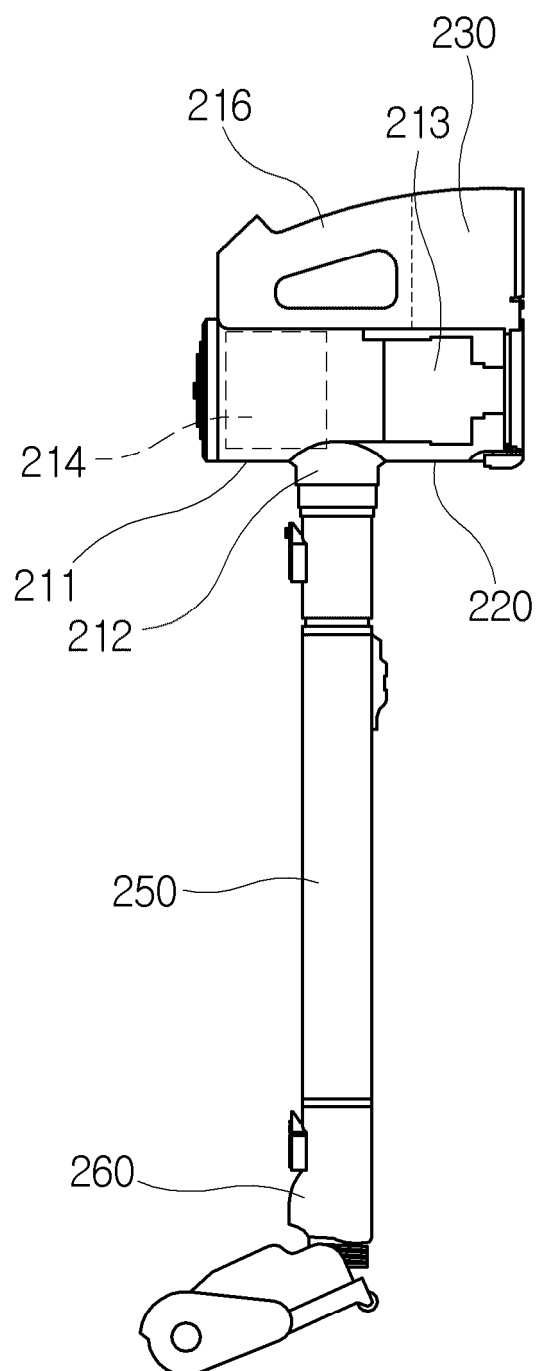


FIG. 4

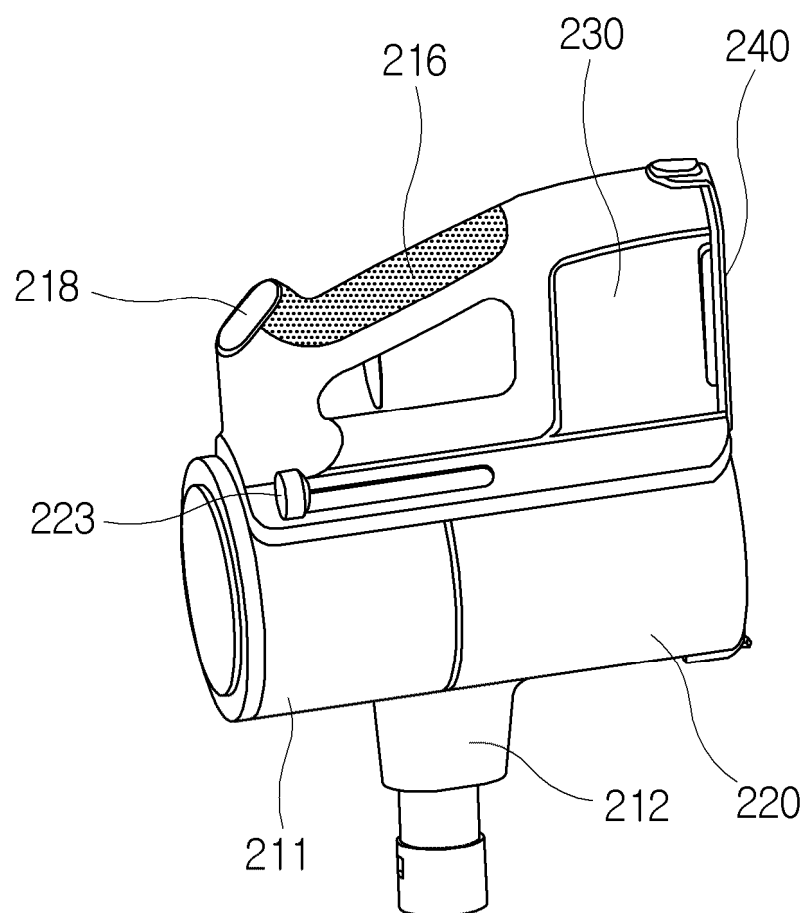


FIG. 5

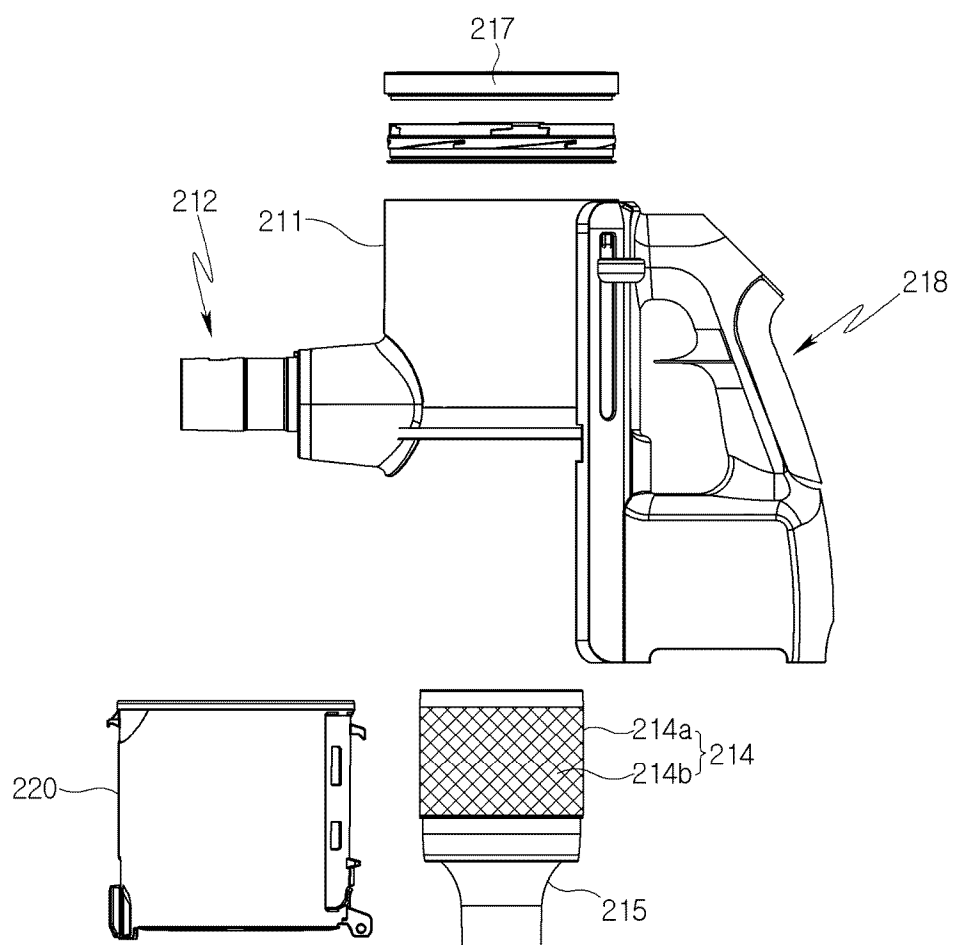


FIG. 6

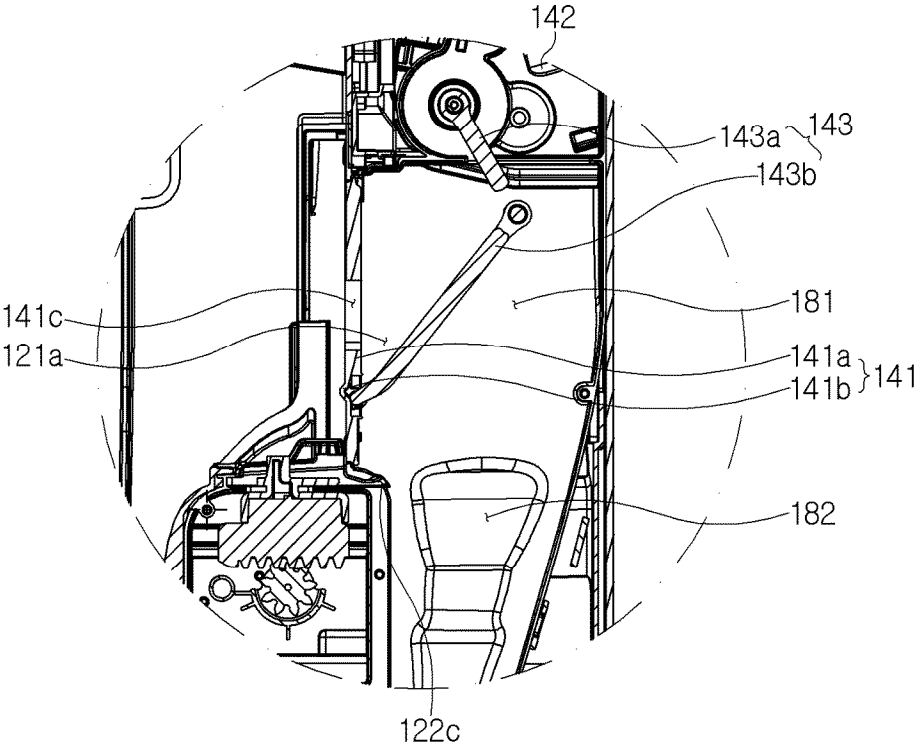


FIG. 7

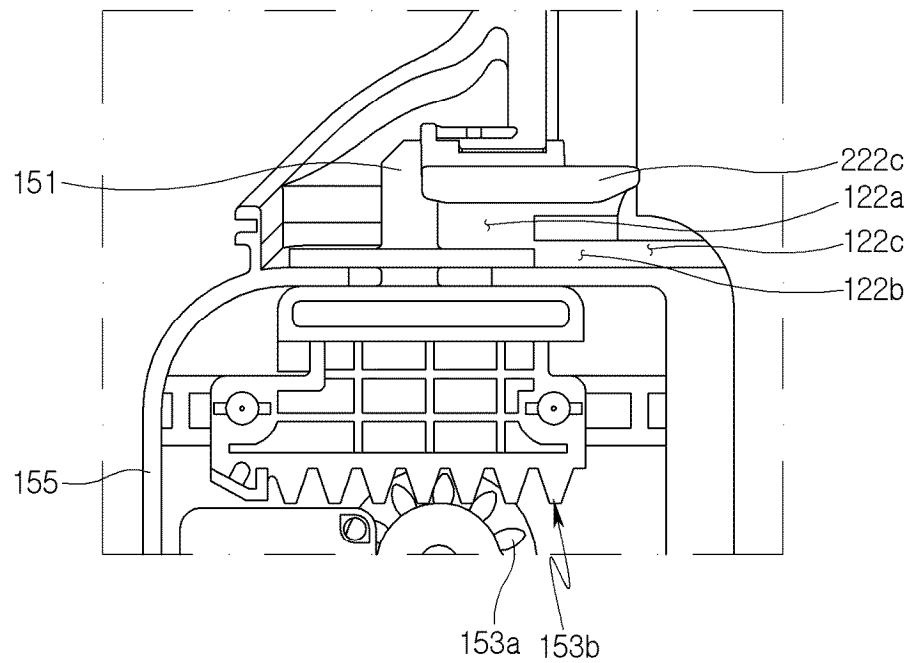


FIG. 8

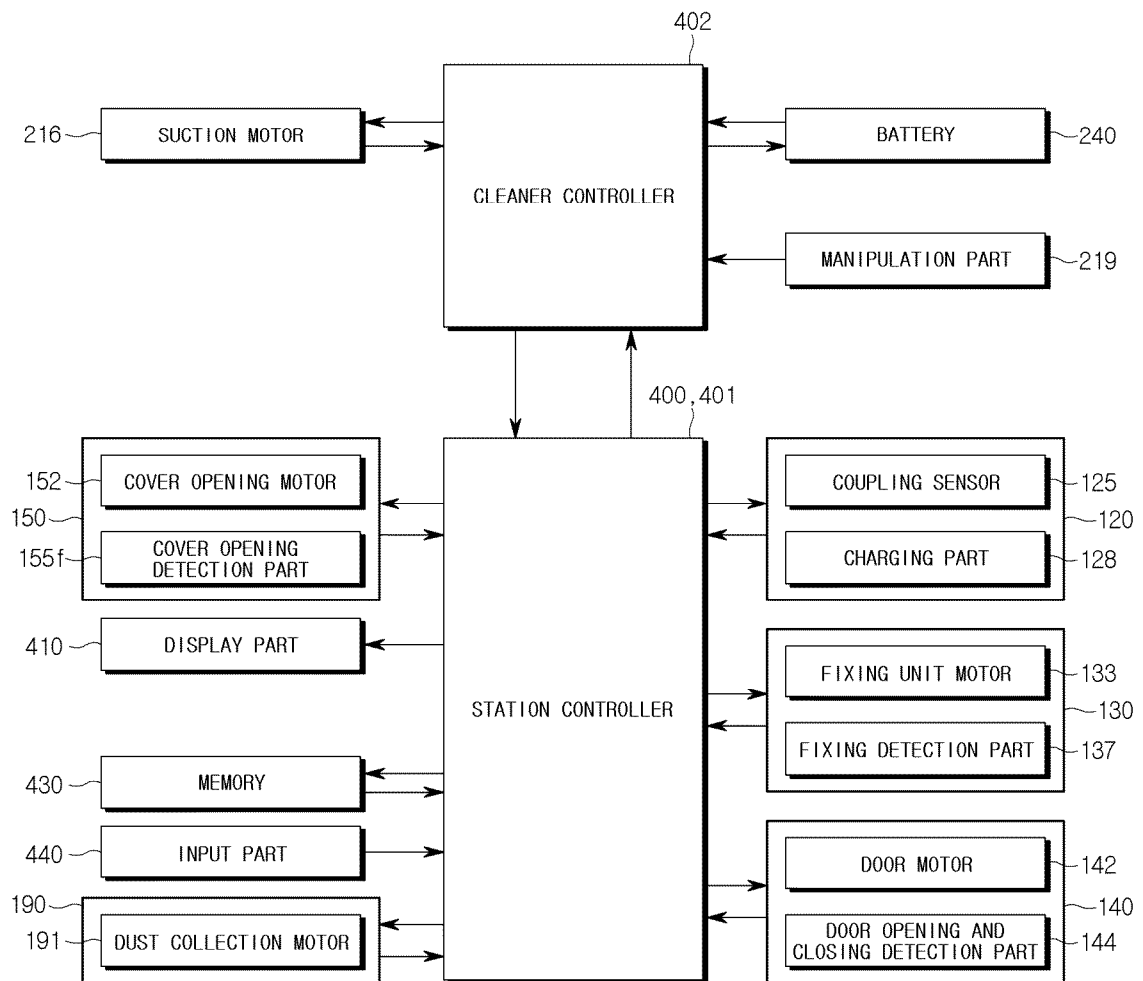


FIG. 9

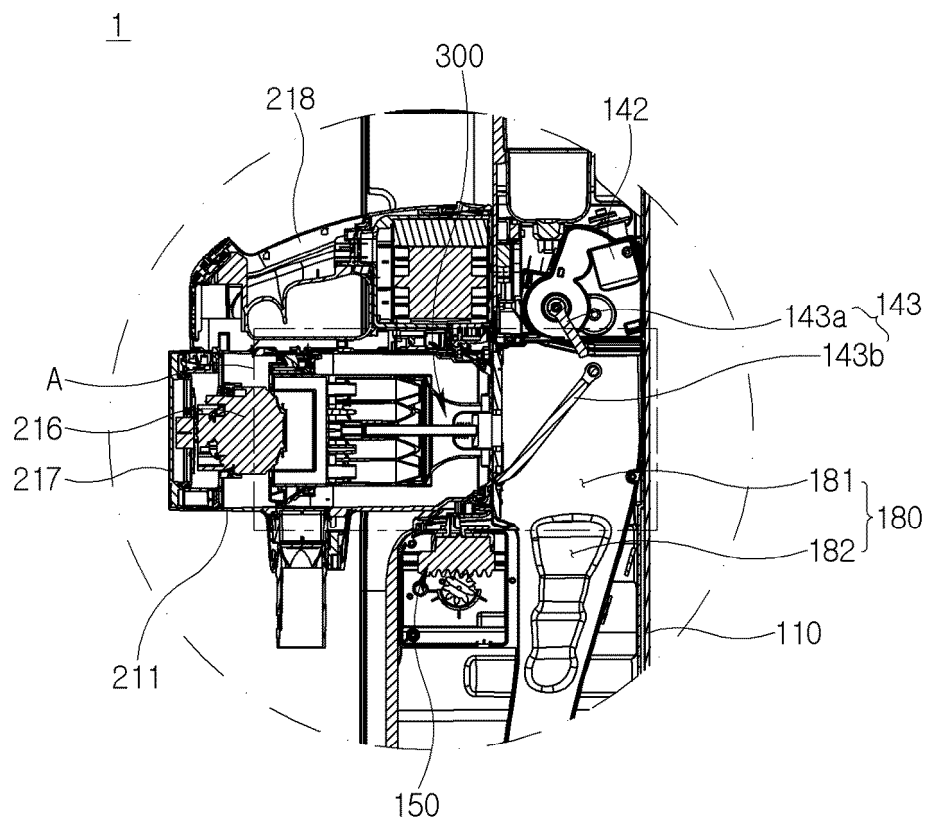


FIG. 10A

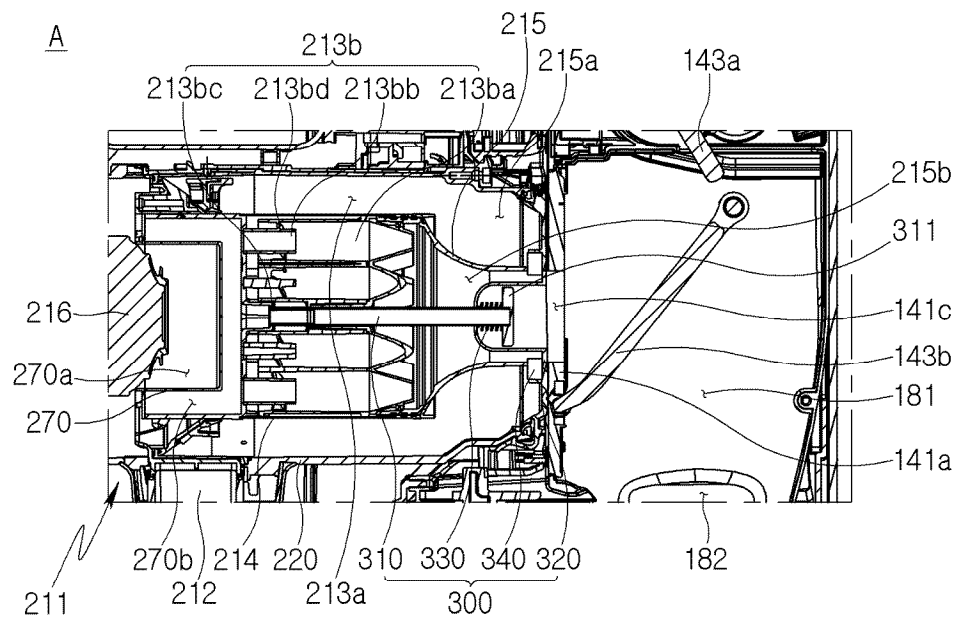


FIG. 10B

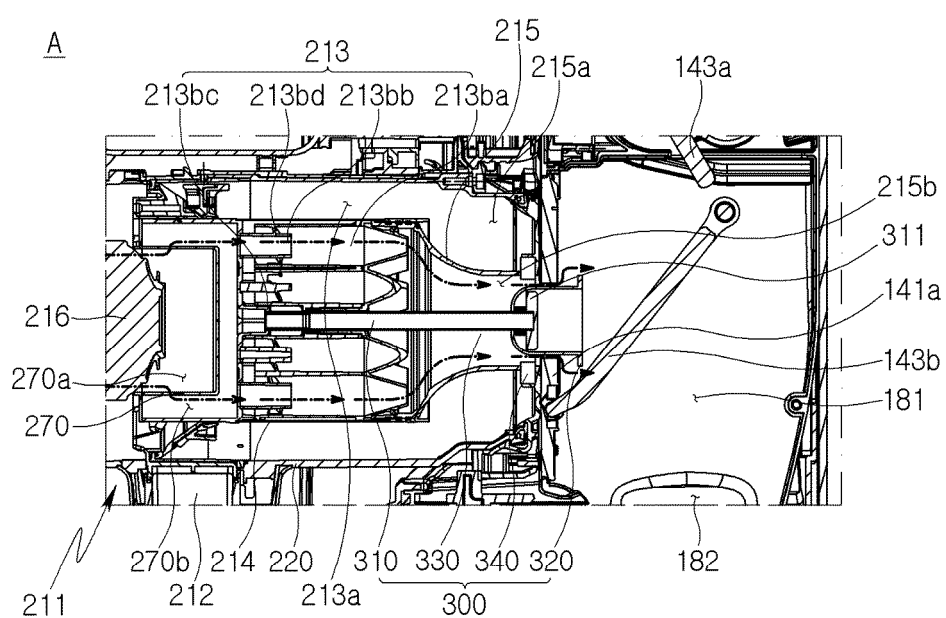


FIG. 11

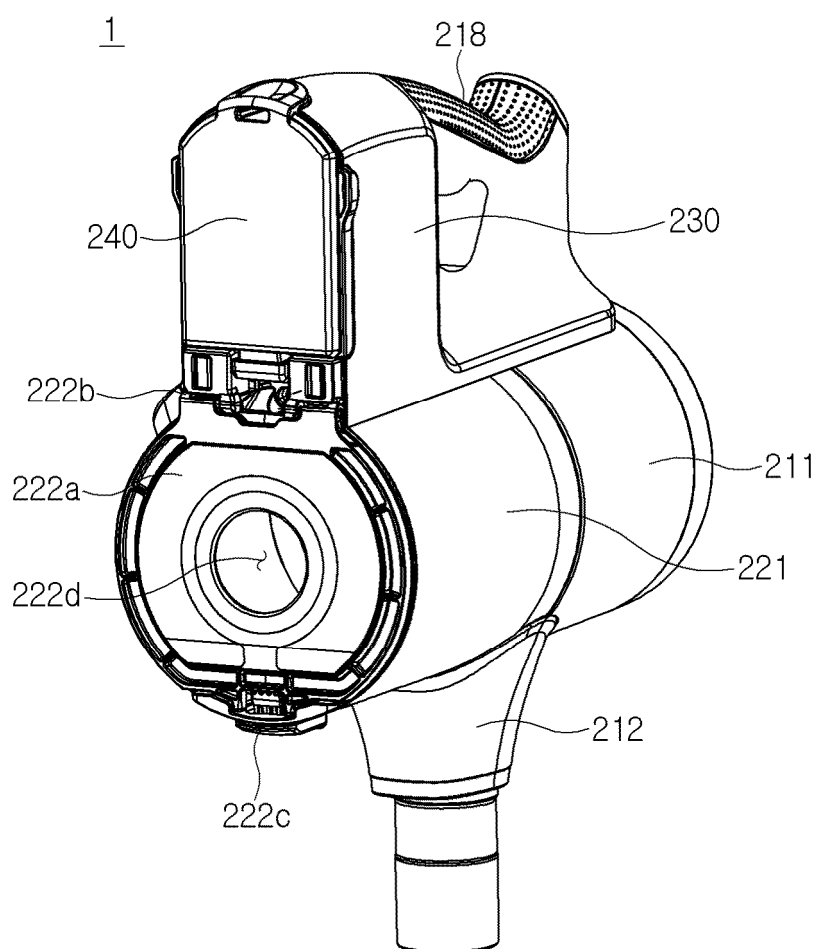


FIG. 12A

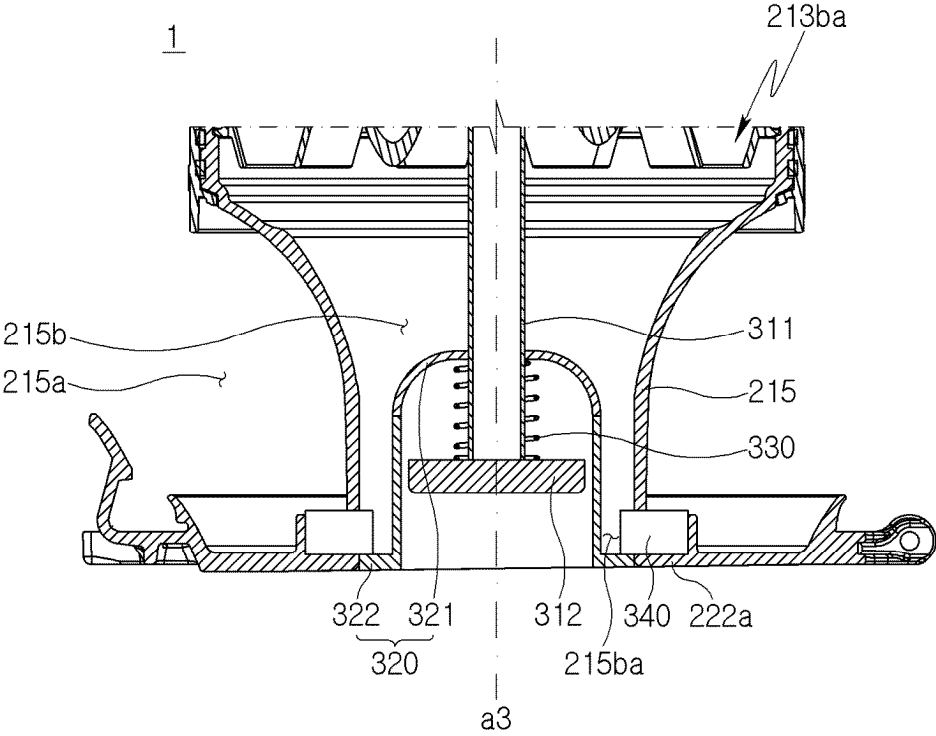


FIG. 12B

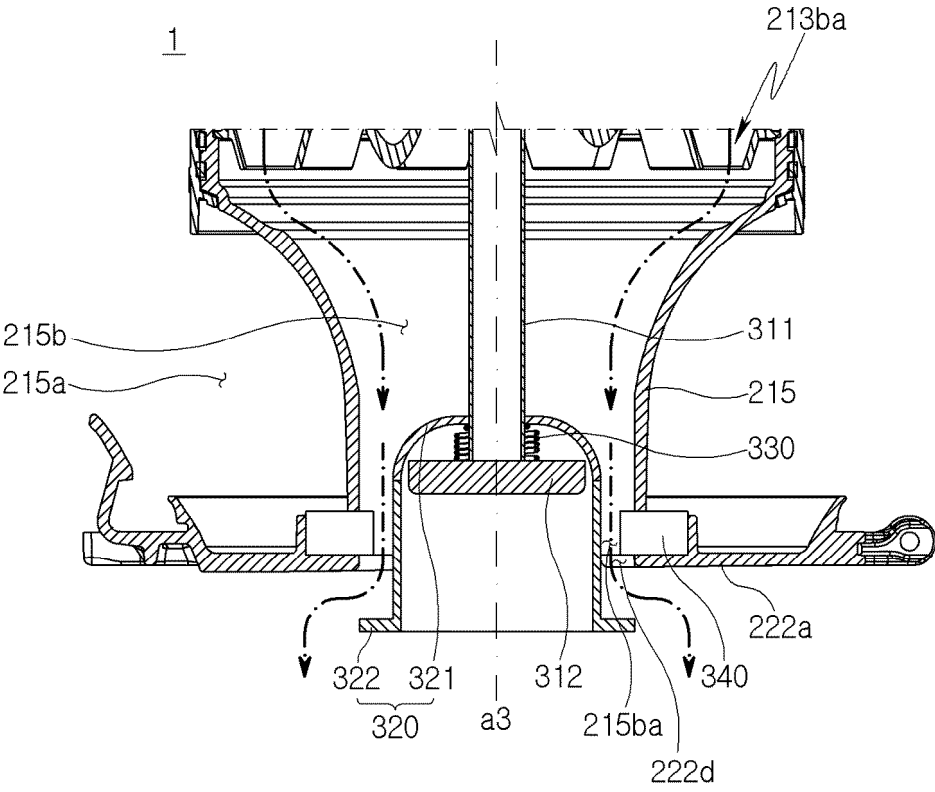


FIG. 13

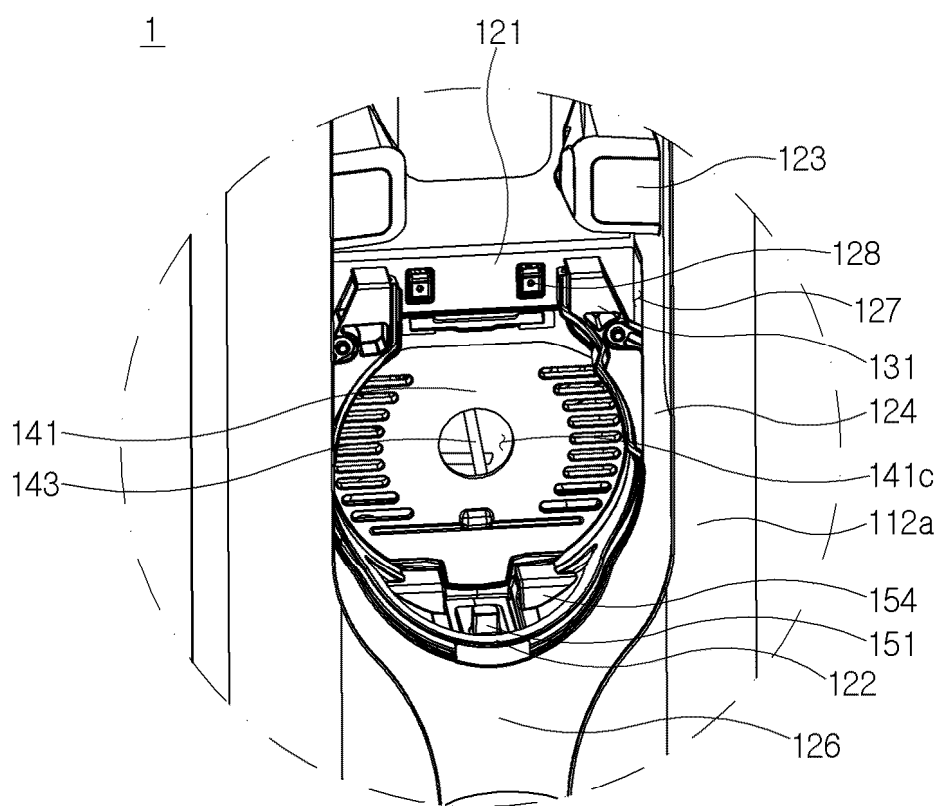


FIG. 14

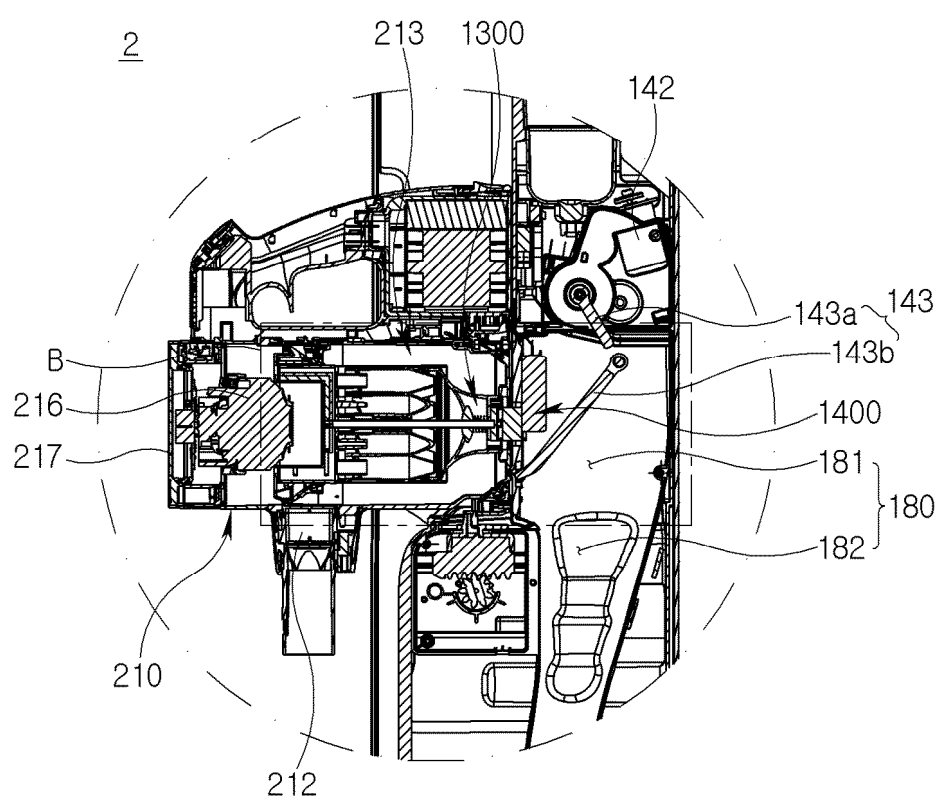


FIG. 15A

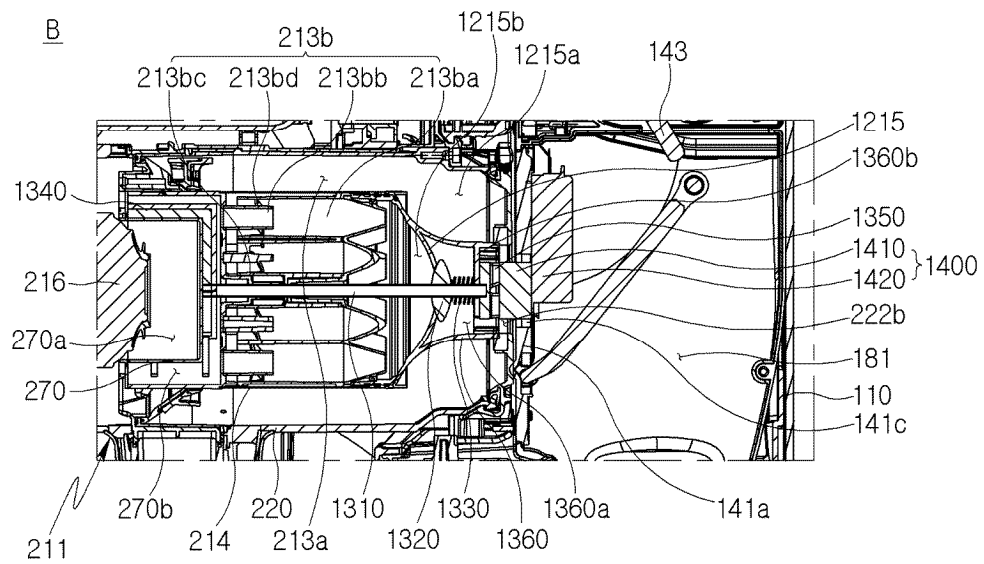


FIG. 15B

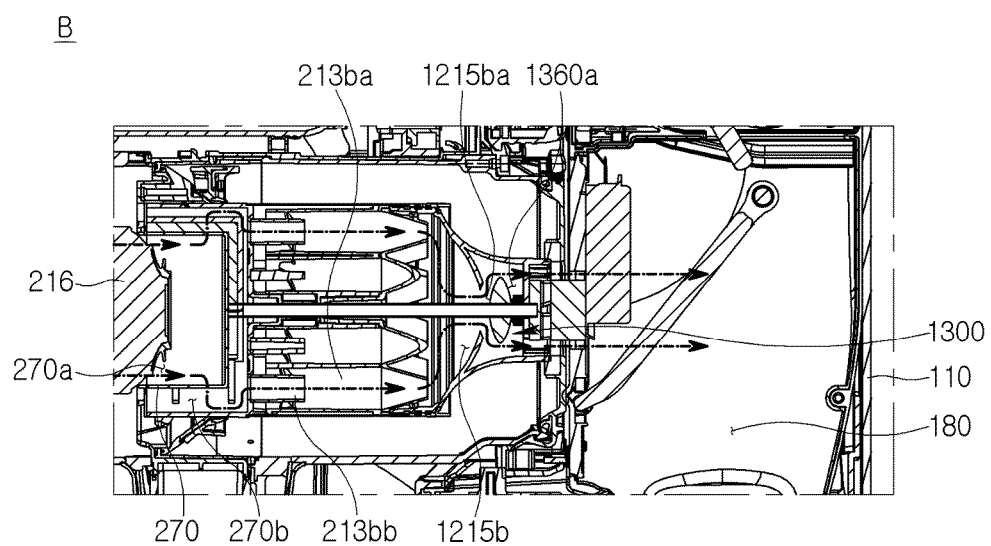


FIG. 16

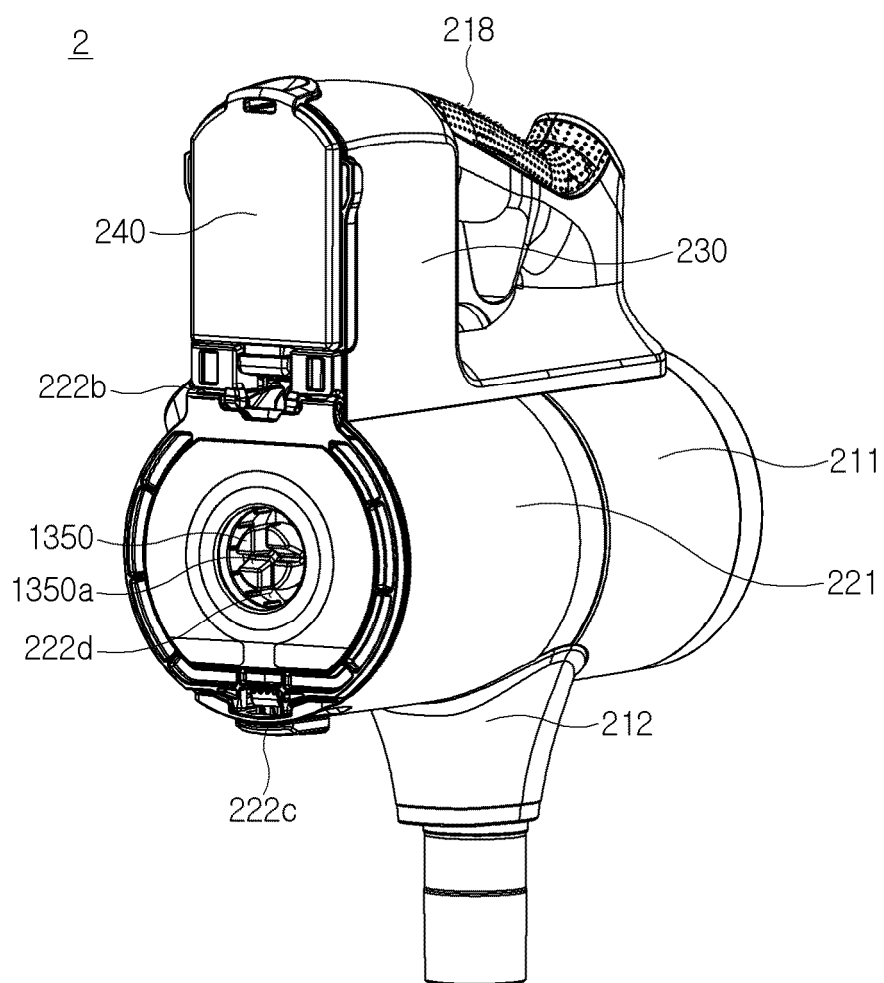


FIG. 17

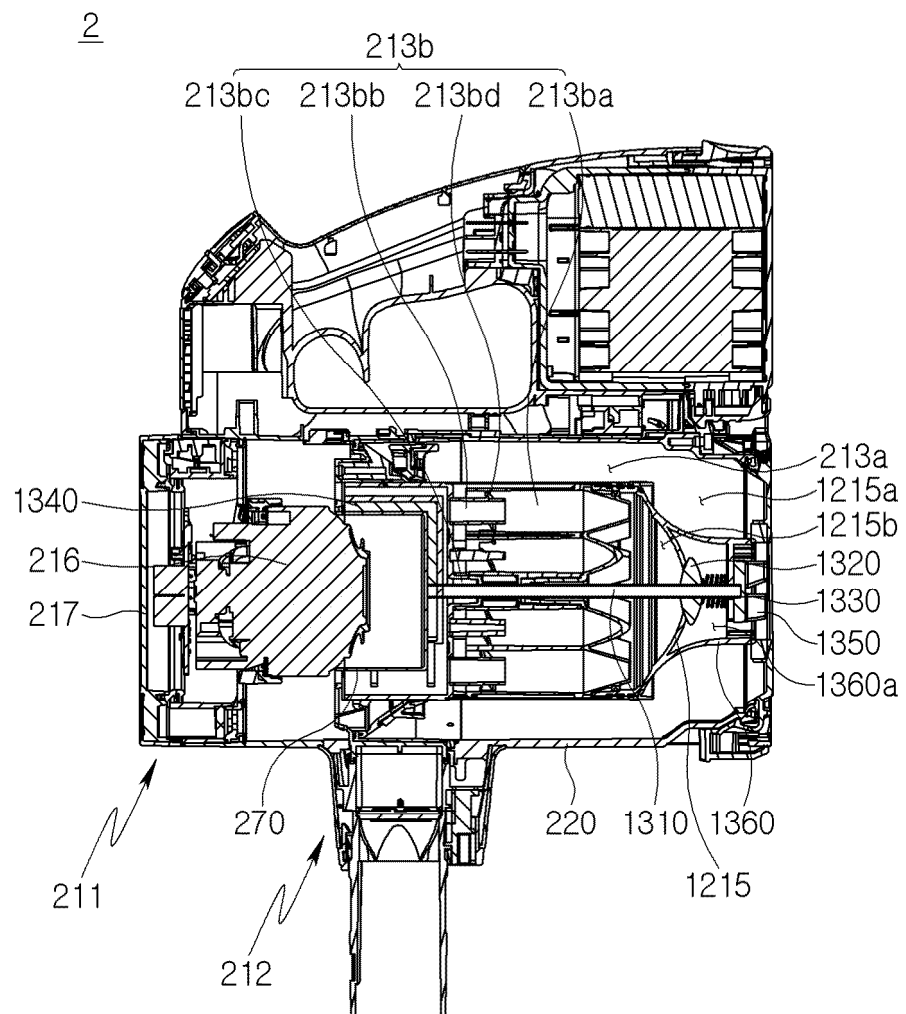


FIG. 18

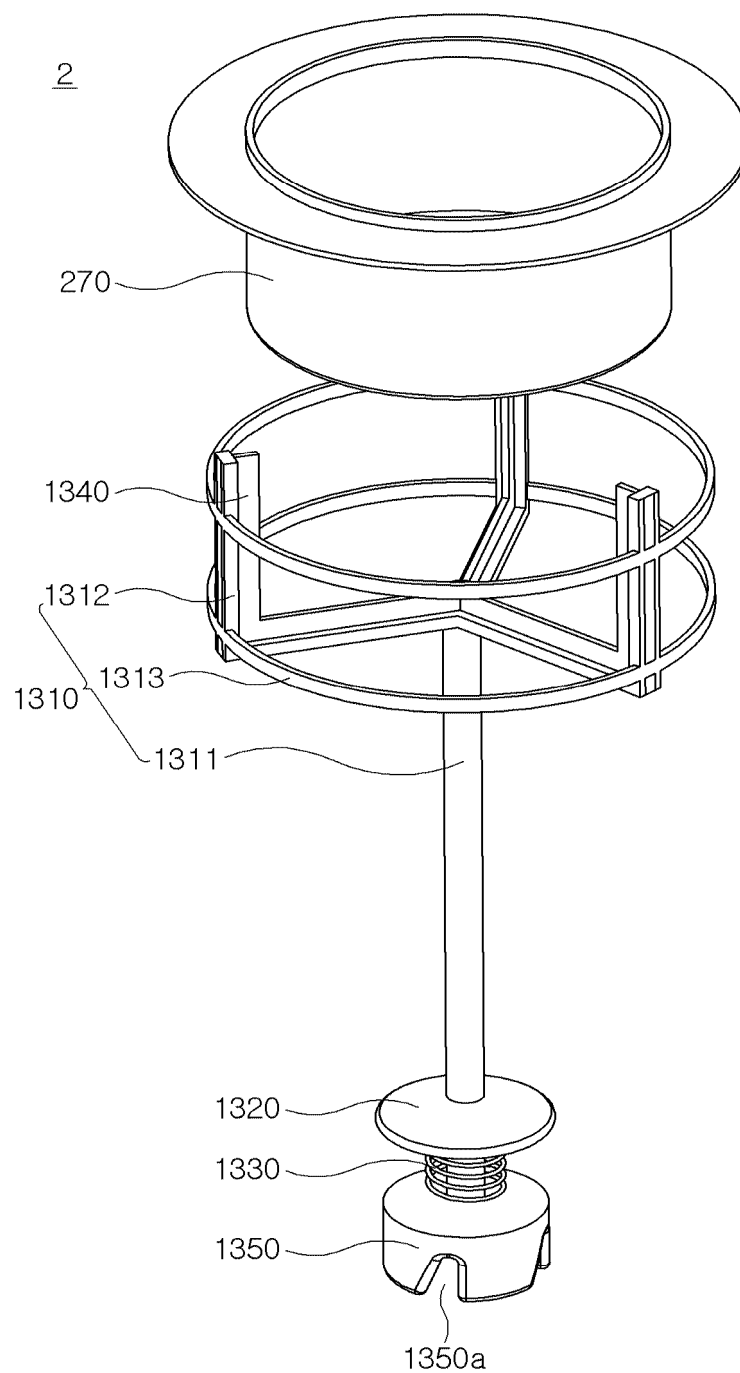


FIG. 19

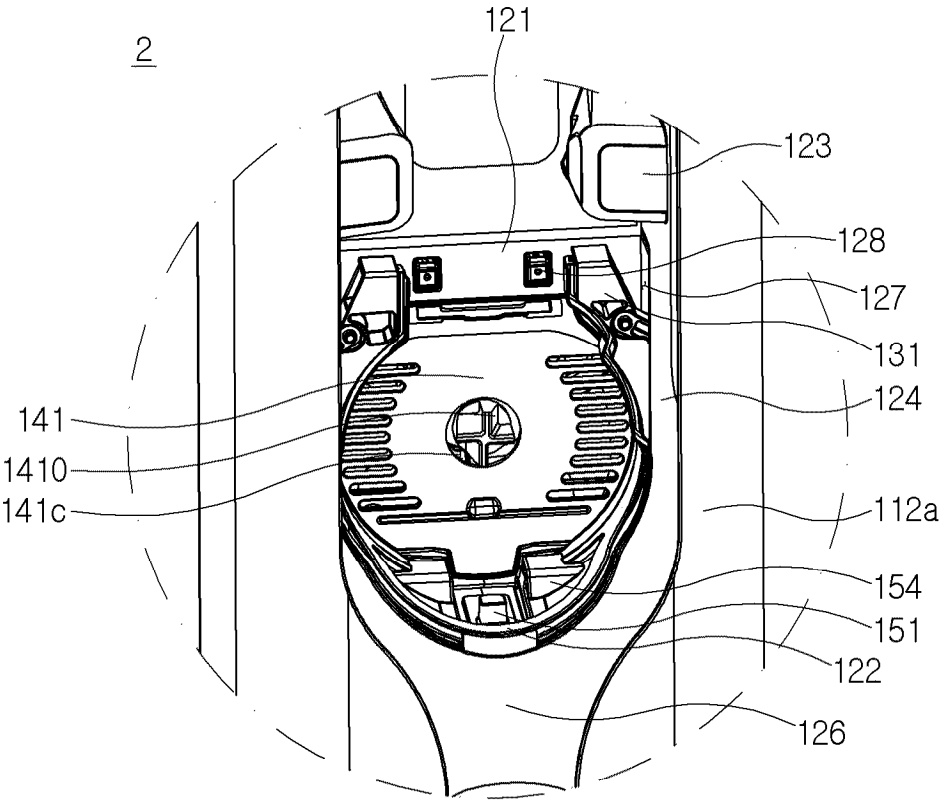


FIG. 20

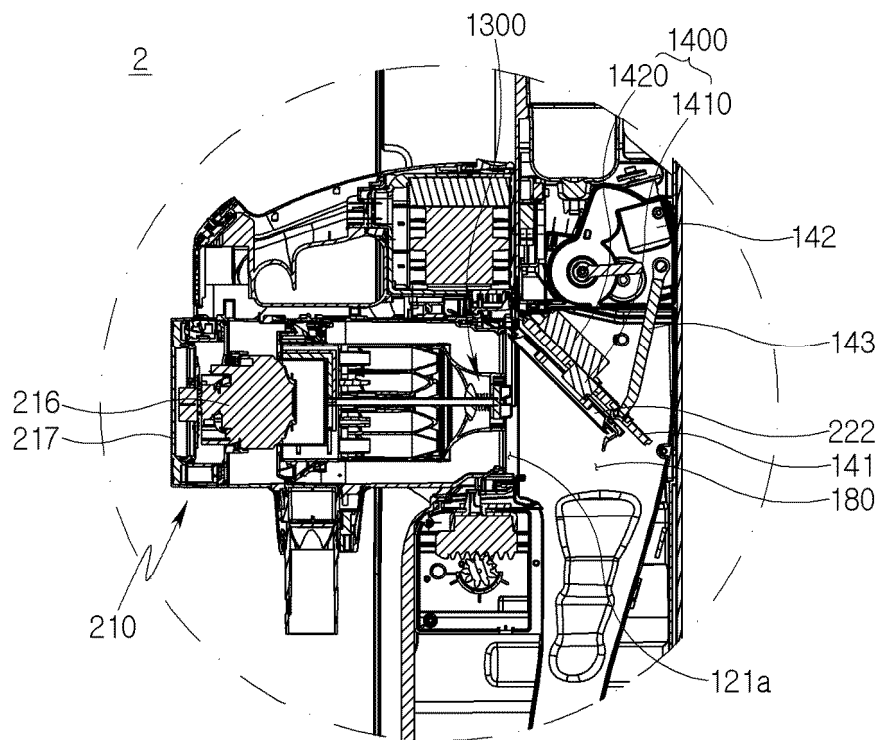


FIG. 21

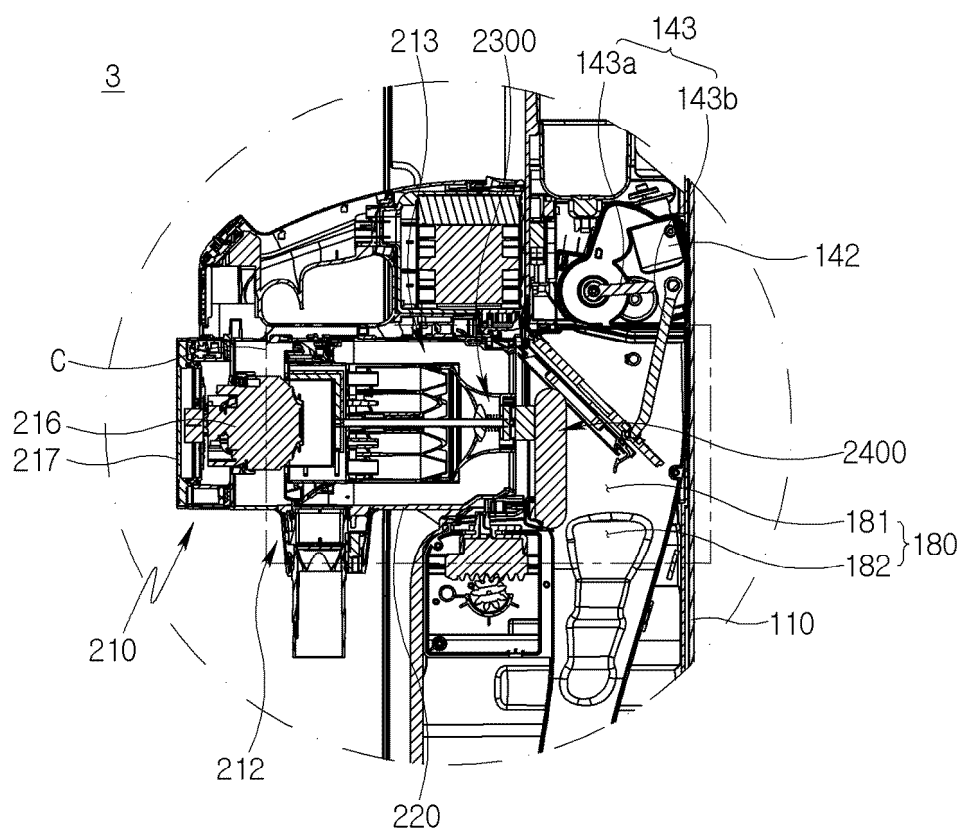


FIG. 22A

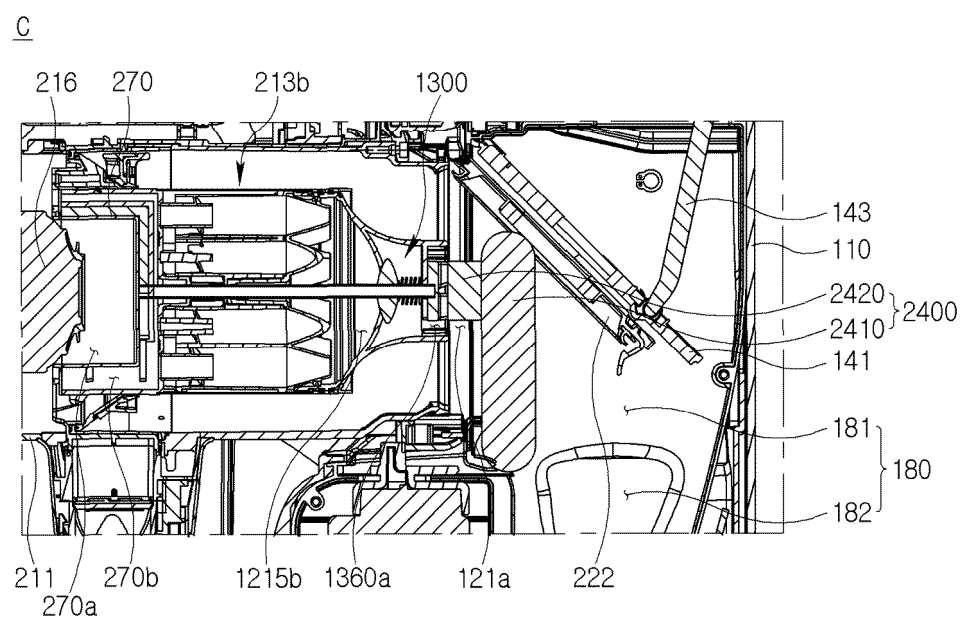
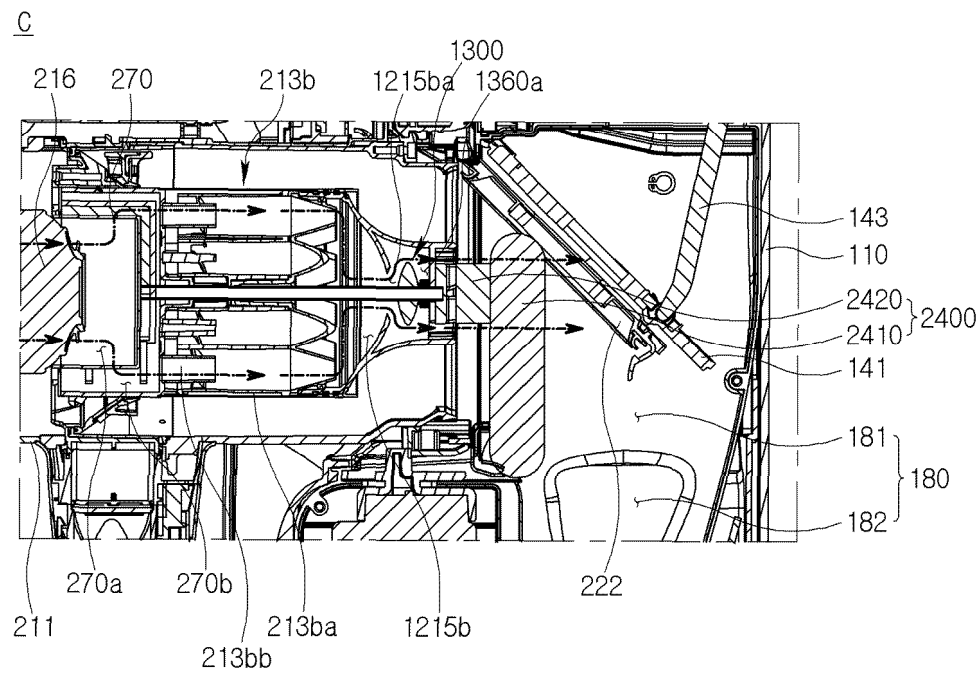


FIG. 22B



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2024/009633

A. CLASSIFICATION OF SUBJECT MATTER

A47L 9/28(2006.01)i; A47L 9/00(2006.01)i; A47L 9/16(2006.01)i; A47L 9/20(2006.01)i; A47L 7/00(2006.01)i;
A47L 5/24(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47L 9/28(2006.01); A47L 9/10(2006.01); A47L 9/16(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), 청소기 스테이션(vacuum cleaner station), 싸이클론부
(cyclone unit), 개폐유닛(opening/closing unit), 청소유닛(cleaning unit)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2023-0082593 A (LG ELECTRONICS INC.) 08 June 2023 (2023-06-08) See paragraphs [0069]-[0259]; and figures 1, 3-4, 6-9, 15 and 21-24.	1-8,20-22
A		9-19
Y	KR 10-2021-0060421 A (SAMSUNG ELECTRONICS CO., LTD.) 26 May 2021 (2021-05-26) See paragraphs [0609]-[0617]; and figures 53-54.	1-7,20,22
Y	KR 10-2023-0089508 A (SAMSUNG ELECTRONICS CO., LTD.) 20 June 2023 (2023-06-20) See paragraph [0122]; and figures 16a-16b.	2-7,20-21
Y	KR 10-2022-0142911 A (SAMSUNG ELECTRONICS CO., LTD.) 24 October 2022 (2022-10-24) See paragraphs [0016]-[0018]; and figures 1 and 10.	6-7
Y	KR 10-2023-0058585 A (BAEK, Sang-Ki) 03 May 2023 (2023-05-03) See paragraph [0024]; claim 1; and figures 6-9.	8,21

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

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

“D” document cited by the applicant in the international application

“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
18 October 2024	24 October 2024
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2024/009633

5	Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
	KR 10-2023-0082593 A	08 June 2023	KR 10-2023-0082404 A	08 June 2023
			WO 2023-101494 A1	08 June 2023
	KR 10-2021-0060421 A	26 May 2021	AU 2019-397017 A1	24 June 2021
10			CN 113226141 A	06 August 2021
			CN 113226141 B	23 June 2023
			CN 115281557 A	04 November 2022
			CN 115281557 B	14 June 2024
			CN 115399666 A	29 November 2022
15			CN 115399666 B	12 December 2023
			CN 115399667 A	29 November 2022
			CN 115399667 B	20 October 2023
			CN 115399668 A	29 November 2022
			CN 115399669 A	29 November 2022
20			CN 116369784 A	04 July 2023
			CN 116369785 A	04 July 2023
			CN 116473459 A	25 July 2023
			DE 202019005876 U1	20 December 2022
25			EP 3878337 A1	15 September 2021
			EP 3878337 A4	26 January 2022
			EP 3878337 B1	04 October 2023
			EP 3878337 C0	04 October 2023
			EP 4005452 A1	01 June 2022
30			EP 4005452 B1	10 May 2023
			EP 4011264 A1	15 June 2022
			EP 4011264 B1	28 August 2024
			EP 4122366 A2	25 January 2023
35			EP 4122366 A3	03 May 2023
			EP 4122366 B1	31 July 2024
			EP 4122370 A2	25 January 2023
			EP 4122370 A3	03 May 2023
			EP 4122370 B1	10 July 2024
			EP 4218523 A1	02 August 2023
40			EP 4226834 A1	16 August 2023
			EP 4226834 B1	28 August 2024
			EP 4230105 A1	23 August 2023
			EP 4230105 B1	31 July 2024
			EP 4233664 A1	30 August 2023
45			KR 10-2020-0073966 A	24 June 2020
			KR 10-2020-0073975 A	24 June 2020
			KR 10-2020-0074001 A	24 June 2020
			KR 10-2020-0074054 A	24 June 2020
			KR 10-2020-0074055 A	24 June 2020
50			KR 10-2020-0131208 A	23 November 2020
			KR 10-2021-0033462 A	26 March 2021
			KR 10-2021-0033463 A	26 March 2021
			KR 10-2021-0033464 A	26 March 2021
			KR 10-2021-0060424 A	26 May 2021
55			KR 10-2166771 B1	16 October 2020
			KR 10-2166773 B1	16 October 2020
			KR 10-2315420 B1	21 October 2021

Form PCT/ISA/210 (patent family annex) (July 2022)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2024/009633

5

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
		KR 10-2392075 B1	29 April 2022
		KR 10-2392099 B1	29 April 2022
		KR 10-2408551 B1	15 June 2022
		KR 10-2452456 B1	11 October 2022
		US 11134817 B2	05 October 2021
		US 11134818 B2	05 October 2021
		US 11337573 B2	24 May 2022
		US 11382471 B2	12 July 2022
		US 11382472 B2	12 July 2022
		US 11937765 B2	26 March 2024
		US 12004703 B2	11 June 2024
		US 2021-0052121 A1	25 February 2021
		US 2021-0259489 A1	26 August 2021
		US 2021-0259490 A1	26 August 2021
		US 2021-0259491 A1	26 August 2021
		US 2021-0290017 A1	23 September 2021
		US 2021-0298549 A1	30 September 2021
		US 2021-0298550 A1	30 September 2021
		US 2022-0095862 A1	31 March 2022
		US 2023-0012532 A1	19 January 2023
		US 2023-0200607 A1	29 June 2023
		US 2024-0016352 A1	18 January 2024
		WO 2020-122631 A1	18 June 2020
KR 10-2023-0089508 A	20 June 2023	EP 4393366 A1	03 July 2024
		US 2023-0180982 A1	15 June 2023
		WO 2023-113225 A1	22 June 2023
KR 10-2022-0142911 A	24 October 2022	US 2023-0180983 A1	15 June 2023
		WO 2023-113173 A1	22 June 2023
KR 10-2023-0058585 A	03 May 2023	None	

Form PCT/ISA/210 (patent family annex) (July 2022)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- KR 1020220115253 [0010]