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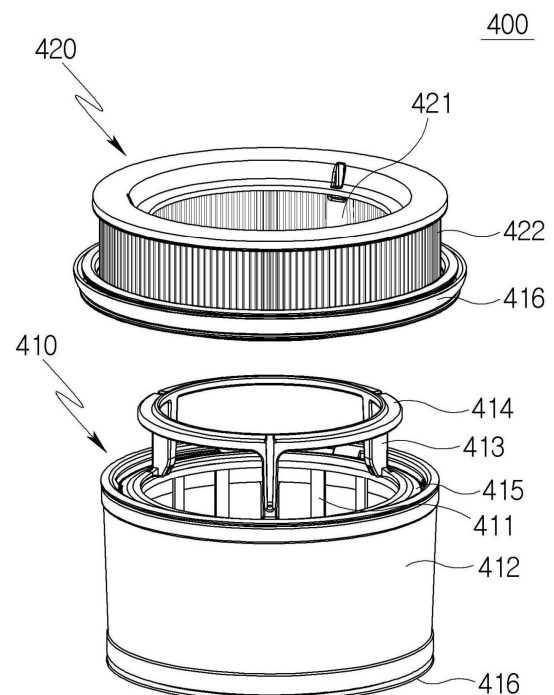
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(54) **CLEANER**

(57) The present disclosure relates to a cleaner in which a plurality of filters are separably coupled to a main body housing of the cleaner and configured such that any one of the plurality of filters is separated first, and then another filter is separated, thereby allowing a user to easily separate and wash the filter.

[FIG. 5]



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## Description

### [Technical Field]

[0001] The present disclosure relates to a cleaner, and more particularly, to a cleaner having a filter capable of being easily separated and washed.

### [Background Art]

[0002] In general, a cleaner refers to an electrical appliance that draws in small garbage or dust by sucking air using electricity and fills a dust bin provided in a product with the garbage or dust. Such a cleaner is generally called a vacuum cleaner.

[0003] The cleaners may be classified into a manual cleaner which is moved directly by a user to perform a cleaning operation, and an automatic cleaner which performs a cleaning operation while autonomously traveling. Depending on the shape of the cleaner, the manual cleaners may be classified into a canister cleaner, an upright cleaner, a handy cleaner, a stick cleaner, and the like.

[0004] The canister cleaners were widely used in the past as household cleaners. However, recently, there is an increasing tendency to use the handy cleaner and the stick cleaner in which a dust bin and a cleaner main body are integrally provided to improve convenience of use.

[0005] In the case of the canister cleaner, a main body and a suction port are connected by a rubber hose or pipe, and in some instances, the canister cleaner may be used in a state in which a brush is fitted into the suction port.

[0006] The handy cleaner (hand vacuum cleaner) has maximized portability and is light in weight. However, because the handy cleaner has a short length, there may be a limitation to a cleaning region when the user cleans the cleaning region while being seated in the cleaning region. Therefore, the handy cleaner is used to clean a local place such as a desk, a sofa, or an interior of a vehicle.

[0007] A user may use the stick cleaner while standing and thus may perform a cleaning operation without bending his/her waist. Therefore, the stick cleaner is advantageous for the user to clean a wide region while moving in the region. The handy cleaner may be used to clean a narrow space, whereas the stick cleaner may be used to clean a wide space and also used to a high place that the user's hand cannot reach. Recently, modularized stick cleaners are provided, such that types of cleaners are actively changed and used to clean various places.

[0008] A main body of the stick cleaner has a suction motor configured to apply a suction force to air containing dust, and a dust separating part using centrifugation. In addition, a prefilter is provided at a front end of the suction motor (a front end of an air flow path) in order to prevent the sucked dust from being introduced into the suction motor. The reason why the prefilter is provided at the front

end of the suction motor is to protect the suction motor from dust or debris. This is because so-called fine dust or ultra-fine dust is not separated completely (100%) although dust is separated from the dust separating part.

[0009] Meanwhile, the amount of fine dust or ultra-fine dust accumulated in the prefilter gradually increases as an operating time of the cleaner increases. Because the prefilter is adjacent to the suction motor, the prefilter has a high temperature, and as a result, an environment is created in which bacteria may easily proliferate.

[0010] As a related document, Korean Patent No. 2292991 is presented. The related document relates to a cleaner, and a main body of the cleaner includes a suction motor, and a filter mechanism configured to filter air, which is discharged from the suction motor, and discharge the filtered air.

[0011] According to the related document, in case that the filter mechanism is separated from the main body of the cleaner, the prefilter is exposed to the outside. In this case, the prefilter may be separated from the main body. Therefore, according to the related document, the prefilter may be hygienically managed.

[0012] However, in the case of the cleaner, in order to separate and wash a filter, a user needs to separate an air discharge cover, disassemble the air discharge cover, and separate a HEPA filter.

[0013] In addition, there is a limitation in gripping a prefilter in the state in which the air discharge cover is separated.

[0014] In addition, because debris is attached to the prefilter and the HEPA filter, there is a problem in that the debris is attached to the user's hand when the user grips the filter.

[0015] In addition, the user cannot recognize a method of separating the HEPA filter and the prefilter.

[0016] Meanwhile, there is a cleaner in which a HEPA filter and a prefilter are integrated to make it easy to replace the filters.

[0017] However, in case that the HEPA filter and the prefilter are integrated, the HEPA filter cannot be washed with water, unlike the prefilter that may be washed with water. As a result, it is difficult to clean the filter.

[0018] In addition, because replacement cycles for the HEPA filter and the prefilter are different, any one of the HEPA filter and the prefilter, for which the replacement cycle remains, needs to be replaced in advance, which leads to an economic burden on the user.

### [Disclosure]

### [Technical Problem]

[0019] The present disclosure has been made in an effort to solve the above-mentioned problem with the cleaner in the related art, and an object of the present disclosure is to provide a cleaner having a filter capable of being easily separated and washed by a user.

[0020] In addition, another object of the present dis-

closure is to provide a cleaner in which a filter, which can be washed with water, and a filter, which cannot be washed with water, may be separated and separately cleaned.

**[0021]** In addition, another object of the present disclosure is to provide a cleaner in which a plurality of filters with different replacement cycles may be separated and separately managed.

**[0022]** In addition, another object of the present disclosure is to provide a cleaner in which a plurality of filters may be prevented from being erroneously assembled when a user assembles the plurality of filters.

**[0023]** In addition, another object of the present disclosure is to provide a cleaner capable of preventing a problem in which dust contained in air is discharged to the outside of the cleaner even though a plurality of filters are used.

### **[Technical Solution]**

**[0024]** In order to achieve the above-mentioned objects, in a cleaner according to the present disclosure, a plurality of filters are separably coupled to a main body housing of the cleaner and configured such that any one of the plurality of filters is separated first, and then another filter is separated.

**[0025]** Specifically, the cleaner according to the present disclosure includes: a main body housing; an air discharge cover detachably coupled to the main body housing and configured to cover an upper side of the main body housing of the cleaner; a suction part having a flow path through which air flows; a dust separating part configured to separate dust from air sucked through the suction part; a suction motor configured to provide a flow force of the air; and a filter part detachably coupled in the main body housing of the cleaner and disposed to surround an outer portion of the suction motor.

**[0026]** In this case, the filter part may include: a first filter configured to filter out debris from the air introduced into the suction motor; and a second filter configured to filter out debris from the air that passes through the suction motor and is discharged, the first filter and the second filter may be separably coupled, and the first filter may be separated from the main body housing after the second filter is separated from the main body housing.

**[0027]** Therefore, the first filter and the second filter may be separately separated and washed.

**[0028]** Further, it is possible to separately wash one of the first filter or the second filter that can be washed with water.

**[0029]** In addition, the first and second filters with different washing or replacement cycles may be separately managed.

**[0030]** In this case, the first filter may include: a first filter housing formed in a cylindrical shape; a first filter portion disposed to surround an outer peripheral surface of the first filter housing; and a plurality of guide ribs extending in a longitudinal direction from the first filter

housing and configured to guide coupling of the first filter to the second filter.

**[0031]** Therefore, it is possible to prevent the first filter and the second filter from being erroneously assembled when the user couples the first filter and the second filter again after the first filter and the second filter are separated.

**[0032]** In addition, the first filter may further include a grip portion formed in an annular shape to connect the plurality of guide ribs.

**[0033]** Therefore, the user may easily grip the grip portion and separate the first filter.

**[0034]** In addition, it is possible to prevent debris attached to the first filter from contaminating the user's hand when the user grips the first filter.

**[0035]** Meanwhile, the second filter may include: a second filter housing formed in a cylindrical shape; and a second filter portion disposed to surround an outer peripheral surface of the second filter housing, and an inner diameter of the second filter housing may be equal to or larger than an inner diameter of the first filter housing.

**[0036]** Therefore, when the first filter and the second filter are coupled, the guide ribs may be inserted into the second filter housing.

**[0037]** Meanwhile, the first filter may further include a second filter accommodation portion extending from one side of the first filter housing based on the longitudinal direction and configured to accommodate at least a part of the second filter.

**[0038]** Therefore, when the first filter and the second filter are coupled, the second filter may be stably coupled to the upper side of the first filter, and it is possible to prevent debris from being discharged to the portion between the first filter and the second filter.

**[0039]** Meanwhile, the cleaner according to the present embodiment may further include a sealer disposed between the first filter and the second filter and configured to seal a portion between the first filter and the second filter.

**[0040]** Specifically, the sealer may be disposed between the second filter accommodation portion and a lower surface of the second filter.

**[0041]** Therefore, it is possible to prevent the air, which passes through the first filter, and the air, which passes through the second filter, from being mixed.

**[0042]** Therefore, it is possible to prevent debris contained in the air from leaking to the outside of the cleaner.

**[0043]** The first filter and the second filter may be separated from the main body housing in a direction intersecting a longitudinal direction of the suction part.

**[0044]** Therefore, the user may separate the first filter and the second filter by raising the first filter and the second filter in a state in which a dust bin of the cleaner stands on a ground surface. Therefore, the user may easily separate the first filter and the second filter.

**[0045]** Meanwhile, in order to achieve the above-mentioned objects, in the cleaner according to the second

embodiment of the present disclosure, the second filter may include: a second filter housing formed in a cylindrical shape; a second filter portion disposed to surround an outer peripheral surface of the second filter housing; and a plurality of hook portions extending in a longitudinal direction from the second filter housing and coupled to the first filter by a hook engagement.

[0046] Therefore, when the first filter is moved upward and separated from the main body housing, the second filter may also be moved upward.

[0047] In this case, the main body housing may include a motor accommodation portion configured to accommodate the suction motor, and a filter stopper configured to restrict a movement of the first filter may be formed on an outer peripheral surface of the motor accommodation portion.

[0048] Therefore, the user may raise the second filter and identify a contaminated state of the first filter.

[0049] In this case, when the second filter moves by a predetermined distance or longer toward an upper side of the main body housing, the first filter may be caught by the filter stopper, and the hook portions may be separated from the first filter.

[0050] Therefore, as necessary, the user may separate only the second filter by raising the second filter.

[0051] Meanwhile, in order to achieve the above-mentioned objects, in the cleaner according to the third embodiment of the present disclosure, the filter part may include: a filter configured to filter out debris from the air introduced into the suction motor; and a sound absorbent configured to reduce noise of the air that passes through the suction motor and is discharged, the filter and the sound absorbent may be separably coupled, and the filter may be separated from the main body housing after the sound absorbent is separated from the main body housing.

[0052] Meanwhile, in order to achieve the above-mentioned objects, in the cleaner according to the fourth embodiment of the present disclosure, the second filter may be separably coupled to the air discharge cover, and the second filter, together with the air discharge cover, may be separated from the main body housing when the air discharge cover is separated from the main body housing.

[0053] Therefore, the second filter may be separated only by the operation of opening the air discharge cover, and the first filter or the second filter may be selectively separated.

#### [Advantageous Effects]

[0054] As described above, according to the cleaner according to the present disclosure, the user may open the air discharge cover in the state in which the cleaner stands on the ground surface, and the user may raise the second filter upward and then raise the first filter, such that the user may easily separate and wash the filter.

[0055] In addition, the prefilter, which can be washed

with water, and the HEPA filter, which cannot be washed with water, may be separated and separately washed with water, thereby maintaining the filter in a clean state.

[0056] In addition, the plurality of filters with different replacement cycles may be separated and separately replaced, thereby reducing the costs required to replace the filter.

[0057] In addition, the position at which the second filter is coupled may be guided by the guide rib of the first filter, thereby preventing a problem in which debris is not filtered or debris is discharged to the outside of the cleaner because the filters are erroneously assembled.

[0058] In addition, the filter part has the plurality of sealers, thereby preventing a problem in which dust contained in air is discharged to the outside of the cleaner even though the plurality of filters are used.

#### [Description of Drawings]

##### [0059]

FIG. 1 is a perspective view of a cleaner according to the present disclosure.

FIG. 2 is a perspective view for explaining a cleaner main body of the cleaner according to the present disclosure.

FIG. 3 is a side view for explaining a configuration of a cleaner main body of a cleaner according to a first embodiment of the present disclosure.

FIG. 4 is a cross-sectional view of FIG. 2.

FIG. 5 is a perspective view for explaining a filter part of the cleaner according to the first embodiment of the present disclosure.

FIG. 6 is a perspective view for explaining a filter part of a cleaner according to a second embodiment of the present disclosure.

FIG. 7 is a perspective view for explaining a state in which a second filter of the cleaner according to the second embodiment of the present disclosure is raised.

FIG. 8 is a cross-sectional view for explaining a state in which a position of a first filter of the cleaner according to the second embodiment of the present disclosure is maintained.

FIG. 9 is a side view for explaining a filter part of a cleaner according to a third embodiment of the present disclosure.

FIG. 10 is a partial cross-sectional view of FIG. 9.

FIG. 11 is a cross-sectional view for explaining the cleaner according to the third embodiment of the present disclosure.

FIG. 12 is a perspective view for explaining a state in which an air discharge cover of a cleaner according to a fourth embodiment of the present disclosure is open.

FIG. 13 is a perspective view for explaining a filter part of a cleaner according to a fifth embodiment of the present disclosure.

FIG. 14 is a perspective view for explaining a filter part of a cleaner according to a sixth embodiment of the present disclosure.

#### [Mode for Invention]

**[0060]** Hereinafter, exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawings.

**[0061]** The present disclosure may be variously modified and may have various embodiments, and particular embodiments illustrated in the drawings will be specifically described below. The description of the embodiments is not intended to limit the present disclosure to the particular embodiments, but it should be interpreted that the present disclosure is to cover all modifications, equivalents and alternatives falling within the spirit and technical scope of the present disclosure.

**[0062]** The terminology used herein is used for the purpose of describing particular embodiments only and is not intended to limit the present disclosure. Singular expressions may include plural expressions unless clearly described as different meanings in the context.

**[0063]** Unless otherwise defined, all terms used herein, including technical or scientific terms, may have the same meaning as commonly understood by those skilled in the art to which the present disclosure pertains. The terms such as those defined in a commonly used dictionary may be interpreted as having meanings consistent with meanings in the context of related technologies and may not be interpreted as ideal or excessively formal meanings unless explicitly defined in the present application.

**[0064]** FIG. 1 is a perspective view of a cleaner according to the present disclosure, FIG. 2 is a perspective view for explaining a cleaner main body of the cleaner according to the present disclosure, FIG. 3 is a side view for explaining a configuration of a cleaner main body of a cleaner according to a first embodiment of the present disclosure, and FIG. 4 is a cross-sectional view of FIG. 2.

**[0065]** Meanwhile, the term "floor surface" used in the present specification may refer to not only a floor surface of a room such as a living room but also a cleaning surface such as a carpet.

**[0066]** With reference to FIGS. 1 to 4, a cleaner 1 according to an embodiment of the present disclosure may include a cleaner main body 100 having a suction motor 140 configured to generate a suction force, a cleaner nozzle 300 connected to the cleaner main body 100 and configured to suck air and debris from the floor surface, and an extension tube 200 configured to connect the cleaner main body 100 and the cleaner nozzle 300.

**[0067]** A structure of the cleaner main body 100 will be described below.

**[0068]** First, a structure of the cleaner 1 will be described below with reference to FIGS. 1 to 4.

**[0069]** The cleaner 1 may refer to a cleaner configured to be manually operated by the user. For example, the

cleaner 1 may refer to a handy cleaner or a stick cleaner.

**[0070]** Meanwhile, in the embodiment of the present disclosure, directions of the cleaner 1 may be defined based on when a bottom surface (lower surface) of a dust bin 170 and a bottom surface (lower surface) of a battery housing 180 are placed on a ground surface.

**[0071]** In this case, a forward direction may refer to a direction in which a suction part 120 is disposed based on the suction motor 140, and a rearward direction may refer to a direction in which a handle 160 is disposed based on the suction motor 140. Further, based on a state in which the suction part 120 is viewed from the suction motor 140, a rightward direction may refer to a direction in which a component is disposed at the right side, and a leftward direction may refer to a direction in which a component is disposed at the left side. In addition, in the embodiment of the present disclosure, upper and lower sides may be defined in a direction perpendicular to the ground surface based on the state in which the bottom surface (lower surface) of the dust bin 170 and the bottom surface (lower surface) of the battery housing 180 are placed on the ground surface.

**[0072]** The cleaner 1 may include the cleaner main body 100. The cleaner main body 100 may include a main body housing 110, the suction part 120, a dust separating part 130, the suction motor 140, an air discharge cover 150, and the handle 160.

**[0073]** The main body housing 110 may define an external appearance of the cleaner 1. The main body housing 110 may provide a space that may accommodate the suction motor 140 and a filter part 400. The main body housing 110 may be formed in a shape similar to a cylindrical shape.

**[0074]** The suction part 120 may protrude outward from the main body housing 110. For example, the suction part 120 may be formed in a cylindrical shape with an opened inside. The suction part 120 may be coupled to an extension tube 200. Therefore, the suction part 120 may provide a flow path (hereinafter, referred to as a 'suction flow path') through which air containing dust may flow.

**[0075]** Meanwhile, in the present embodiment, an imaginary line may be defined to penetrate the inside of the suction part 120 having a cylindrical shape.

**[0076]** The dust separating part 130 may communicate with the suction part 120. The dust separating part 130 may separate dust sucked into the dust separating part 130 through the suction part 120. A space in the dust separating part 130 may communicate with a space in the dust bin 170.

**[0077]** For example, the dust separating part 130 may have at least one cyclone part capable of separating dust by using a cyclone flow. Further, the space in the dust separating part 130 may communicate with the suction flow path. Therefore, air and dust, which are sucked through the suction part 120, spirally flow along an inner circumferential surface of the dust separating part 130. Therefore, the cyclone flow may be generated in an internal space of the dust separating part 130.

**[0078]** The dust separating part 130 may communicate with the suction part 120. The dust separating part 130 adopts a principle of a dust collector using a centrifugal force to separate the dust sucked into the cleaner main body 100 through the suction part 120.

**[0079]** The dust separating part 130 may further include a secondary cyclone part configured to separate again dust from the air discharged from the cyclone part. In this case, the secondary cyclone part may be positioned in the cyclone part to minimize a size of the dust separating part. The secondary cyclone part may include a plurality of cyclone bodies disposed in parallel. The air discharged from the cyclone part may be distributed to and pass through the plurality of cyclone bodies.

**[0080]** In this case, an axis of a cyclone flow of the secondary cyclone part may also extend in an upward/-downward direction. The axis of the cyclone flow of the cyclone part and the axis of the cyclone flow of the secondary cyclone part may be disposed coaxially in the upward/downward direction and collectively called

an axis of the cyclone flow of the dust separating part 130. **[0081]** Meanwhile, the dust separating part 130 may be surrounded by a mesh net 131. The mesh net 131 may serve to prevent foreign substances, which have relatively large sizes among foreign substances contained in air having passed through the suction part 120, from being introduced into the dust separating part 130. That is, the mesh net 131 may be formed in a cylindrical shape, and a plurality of holes may be formed along an outer peripheral surface of the mesh net 131.

**[0082]** The suction motor 140 may generate a suction force for sucking air. The suction motor 140 may include a motor shaft, and an impeller configured to be rotated by a rotation of the motor shaft. Therefore, a flow force of the air may be generated by the rotation of the impeller. As a result, the suction motor 140 may generate the suction force while rotating.

**[0083]** The suction motor 140 may be accommodated in the main body housing 110. Specifically, the suction motor 140 may be accommodated in a motor accommodation portion 111 formed in the main body housing 110. For example, the suction motor 140 may be provided in a shape similar to a cylindrical shape and accommodated in the motor accommodation portion 111.

**[0084]** Meanwhile, in the present embodiment, an imaginary suction motor axis may be formed by extending a rotation axis of the suction motor 140.

**[0085]** The air discharge cover 150 may be disposed at one side of the main body housing 110 based on an axial direction. The air discharge cover 150 may be configured to open or close an internal space of the main body housing 110. For example, the air discharge cover 150 may be hingedly coupled to the main body housing 110.

**[0086]** A display part (not illustrated) may be disposed on the air discharge cover 150. For example, the display part (not illustrated) may be disposed on an upper surface of the air discharge cover 150.

**[0087]** A printed circuit board (not illustrated) config-

ured to control the display part (not illustrated) may be provided in the air discharge cover 150.

**[0088]** The air discharge cover 150 may have an air discharge port 151 for discharging the air introduced by the suction force of the suction motor 140.

**[0089]** A flow guide may be disposed on the air discharge cover 150. The flow guide may guide a flow of the air to be discharged through the air discharge port 151.

**[0090]** Meanwhile, a flow path, through which the air having passed through the inside of the dust bin 170, may be formed in the main body housing 110. Specifically, the flow path may include a flow path configured to guide the air so that the air flows from the dust separating part 130 to the suction motor 140, and a flow path configured to guide the air, which has passed through the suction motor 140, so that the air flows to the air discharge port 151.

**[0091]** Further, a first filter 410 may be disposed in the flow path configured to connect the dust separating part 130 and the suction motor 140, and a second filter 420 may be disposed in the flow path configured to connect the suction motor 140 and the air discharge port 151. The first filter 410 may refer to a prefilter. The first filter 410 may refer to a filter configured to filter out debris (dust), such as fur, lint, and hair, having relatively large sizes. Further, the second filter 420 may refer to a HEPA filter. The second filter 420 may refer to a filter configured to filter out fine dust having relatively small sizes.

**[0092]** Meanwhile, in the cleaner 1 according to the embodiment of the present disclosure, the first filter 410 may be disposed at a position that surrounds an outer side of an outer peripheral surface of the suction motor 140. With this configuration, it is possible to minimize a path through which the air flows. In addition, it is possible to increase an area through which the air passes through the first filter 410 during the process in which the air flows. Therefore, according to the present disclosure, it is possible to maximize the effect of filtering out debris while minimizing a flow loss.

**[0093]** The structure and arrangement of the filter part 400 will be described below.

**[0094]** The handle 160 may be gripped by the user. The handle 160 may be disposed rearward of the suction motor 140. For example, the handle 160 may be formed in a shape similar to a cylindrical shape. Alternatively, the handle 160 may be formed in a curved cylindrical shape. The handle 160 may be disposed at a predetermined angle with respect to the main body housing 110, the suction motor 140, or the dust separating part 130.

**[0095]** The handle 160 may include a grip portion formed in a column shape so that the user may grasp the grip portion, a first extension portion connected to one end of the grip portion based on the longitudinal direction (axial direction) of the grip portion and extending toward the suction motor 140, and a second extension portion connected to the other end of the grip portion based on the longitudinal direction (axial direction) of the grip portion and extending toward the dust bin 170.

**[0096]** An upper side of the handle 160 may define an

external appearance of a part of an upper side of the cleaner 1. Therefore, it is possible to prevent a component of the cleaner 1 from coming into contact with the user's arm in case that the user grips the handle 160.

**[0097]** The first extension portion may extend from the grip portion toward the main body housing 110 or the suction motor 140. At least a part of the first extension portion may extend in a horizontal direction.

**[0098]** The second extension portion may extend from the grip portion toward the dust bin 170. At least a part of the second extension portion may extend in the horizontal direction.

**[0099]** An operating part may be disposed on the handle 160. The operating part may be disposed on an inclined surface formed in an upper region of the handle 160. The user may input an instruction for operating or stopping the cleaner 1 through the operating part.

**[0100]** The cleaner 1 may include the dust bin 170. The dust bin 170 may communicate with the dust separating part 130. The dust bin 170 may store the dust separated by the dust separating part 130.

**[0101]** The dust bin 170 may include a dust bin main body 171, a discharge cover 172, a dust bin compression lever 173, and a compression member 174.

**[0102]** The dust bin main body 171 may provide a space capable of storing the dust separated by the dust separating part 130. For example, the dust bin main body 171 may be formed in a shape similar to a cylindrical shape.

**[0103]** A part of a lower side (bottom side) of the dust bin main body 171 may be opened. In addition, a lower extension portion may be formed at the lower side (bottom side) of the dust bin main body 171. The lower extension portion may be formed to block a part of the lower side of the dust bin main body 171.

**[0104]** The dust bin 170 may include the discharge cover 172. The discharge cover 172 may be disposed at a lower side of the dust bin 170.

**[0105]** The discharge cover 172 may be provided to open or close one end of the dust bin main body 171 based on the longitudinal direction. Specifically, the discharge cover 172 may selectively open or close the lower side of the dust bin 170 that is opened downward.

**[0106]** The discharge cover 172 may include a cover main body and a hinge part. The cover main body may be formed to block a part of the lower side of the dust bin main body. The cover main body may rotate downward relative to the hinge part. The hinge part may be disposed adjacent to the battery housing 180. The hinge part may have a torsion spring. Therefore, in case that the discharge cover 172 is separated from the dust bin main body 171, an elastic force of the torsion spring may support the cover main body in a state in which the cover main body is rotated by a predetermined angle or more about the hinge part with respect to the dust bin main body 171.

**[0107]** The discharge cover 172 may be coupled to the dust bin 170 by a hook engagement. Meanwhile, the

discharge cover 172 may be separated from the dust bin 170 by means of a coupling lever. The coupling lever may be disposed at a front side of the dust bin. Specifically, the coupling lever may be disposed on an outer surface at the front side of the dust bin 170. When an external force is applied, the coupling lever may elastically deform a hook, which extends from the cover main body, in order to release the hook engagement between the cover main body and the dust bin main body 171.

**[0108]** In case that the discharge cover 172 is closed, the lower side of the dust bin 170 may be blocked (sealed) by the discharge cover 172 and the lower extension portion.

**[0109]** The dust bin 170 may include the dust bin compression lever 173. The dust bin compression lever 173 may be disposed outside the dust bin 170 or the dust separating part 130. The dust bin compression lever 173 may be disposed outside the dust bin 170 or the dust separating part 130 so as to be movable upward and downward. The dust bin compression lever 173 may be connected to the compression member 174. In case that the dust bin compression lever 173 is moved downward by an external force, the compression member 174 may also be moved downward.

**[0110]** Therefore, it is possible to provide convenience for the user. The compression member 174 and the dust bin compression lever 173 may return back to original positions by an elastic member (not illustrated). Specifically, in case that the external force applied to the dust bin compression lever 173 is eliminated, the elastic member may move the dust bin compression lever 173 and the compression member 174 upward.

**[0111]** The compression member 174 may be disposed in the dust bin main body 171. The compression member may move in the internal space of the dust bin main body 171. Specifically, the compression member may move upward and downward in the dust bin main body 171.

**[0112]** Therefore, the compression member may compress downward the dust in the dust bin main body 171. In addition, in case that the discharge cover 172 is separated from the dust bin main body 171 and thus the lower side of the dust bin 170 is opened, the compression member may move from an upper side of the dust bin 170 to the lower side of the dust bin 170, thereby removing debris such as residual dust in the dust bin 220.

**[0113]** Therefore, it is possible to improve the suction force of the cleaner by preventing the residual dust from remaining in the dust bin 170. Further, it is possible to remove an offensive odor caused by the residual dust by preventing the residual dust from remaining in the dust bin 170.

**[0114]** The cleaner 1 may include the battery housing 180. A battery 190 may be accommodated in the battery housing 180. The battery housing 180 may be disposed below the handle 160. For example, the battery housing 180 may have a hexahedral shape opened at a lower side thereof. A rear side of the battery housing 180 may be

connected to the handle 160.

**[0115]** The battery housing 180 may include an accommodation portion opened downward. The battery 190 may be attached or detached through the accommodation portion of the battery housing 180.

**[0116]** The cleaner 1 may include the battery 190.

**[0117]** For example, the battery 190 may be separably coupled to the cleaner 1. The battery 190 may be separably coupled to the battery housing 180. For example, the battery 190 may be inserted into the battery housing 180 from the lower side of the battery housing 180. With this configuration, the portability of the cleaner 1 may be improved.

**[0118]** On the contrary, the battery 190 may be integrally provided in the battery housing 180. In this case, a lower surface of the battery 190 is not exposed to the outside.

**[0119]** The battery 190 may supply power to the suction motor 140 of the cleaner 1. The battery 190 may be disposed below the handle 160. The battery 190 may be disposed rearward of the dust bin 170.

**[0120]** In case that the battery 190 is coupled to the battery housing 180 in accordance with the embodiment, the lower surface of the battery 190 may be exposed to the outside. Because the battery 190 may be placed on the floor when the cleaner 1 is placed on the floor, the battery 190 may be immediately separated from the battery housing 180. In addition, because the lower side of the battery 190 is exposed to the outside and thus in direct contact with the air present outside the battery 190, the performance in cooling the battery 190 may be improved.

**[0121]** Meanwhile, in case that the battery 190 is fixed integrally to the battery housing 180, the number of structures for attaching or detaching the battery 190 and the battery housing 180 may be reduced, and as a result, it is possible to reduce an overall size of the cleaner 1 and a weight of the cleaner 200.

**[0122]** The cleaner 1 may include the extension tube 200. The extension tube 200 may communicate with the cleaner nozzle 300. The extension tube 200 may communicate with the cleaner main body 100. The extension tube 200 may communicate with the suction part 120 of the cleaner main body 100. The extension tube 200 may be formed in a long cylindrical shape.

**[0123]** The cleaner main body 100 may be connected to the extension tube 200. The cleaner main body 100 may be connected to the cleaner nozzle 300 through the extension tube 200. The cleaner main body 100 may generate the suction force by means of the suction motor 140 and provide the suction force to the cleaner nozzle 300 through the extension tube 200. The outside dust may be introduced into the cleaner main body 100 through the cleaner nozzle 300 and the extension tube 200.

**[0124]** The cleaner 1 may include the cleaner nozzle 300. The cleaner nozzle 300 may communicate with the extension tube 200. Therefore, the outside air may be

introduced into the cleaner main body 100 of the cleaner 1 via the cleaner nozzle 300 and the extension tube 200 by the suction force generated in the cleaner main body 100 of the cleaner 1.

**[0125]** For example, the cleaner nozzle 300 may be a suction nozzle. In this case, the suction nozzle may refer to a device configured to come into contact with the floor and directly suck dust and air. Therefore, the suction force, which is generated by the suction motor 140 mounted in the cleaner main body 100 of the cleaner, is transmitted to the suction nozzle, and dust and air are sucked into the suction nozzle by the suction force.

**[0126]** An agitator may be installed in the suction nozzle. The agitator serves to scrape dust on the floor or dust in a carpet while rotating, thereby improving cleaning performance.

**[0127]** Meanwhile, the cleaner nozzle 300 includes a nozzle body and a suction port.

**[0128]** The nozzle body may be detachably coupled to the extension tube 200 or the cleaner main body 100 of the cleaner. In addition, a flow path, through which air and dust may flow, may be formed in the nozzle body.

**[0129]** The suction port may refer to a space formed in a bottom surface of the nozzle body (a surface facing the ground surface) so that outside air and dust are introduced into the space. The suction port is formed to communicate with the flow path formed in the nozzle body. Therefore, when the suction motor 140 operates, outside air and dust may be introduced into the cleaner main body 100 of the cleaner through the suction port by the suction force of the suction motor 140.

**[0130]** Meanwhile, a flow of the air in the cleaner 1 of the present disclosure will be described below with reference to FIG. 4.

**[0131]** When the dust-containing air is sucked into the cleaner main body 100 by the operation of the suction motor 140, the air is introduced into the dust bin 170 through the flow path (suction flow path) in the suction part 120. Further, when the air introduced into the dust bin 170 performs the cyclone flow at least once in the dust separating part 130, the dust in the air is collected at the lower side of the dust bin 170, and the air, from which the dust is separated, flows toward the suction motor 140.

**[0132]** In this case, debris, such as hair, with a relatively large size may be mixed with the air that passes through the dust separating part 130 and flows to the suction motor 140, and the debris may be filtered out by the first filter 410. Meanwhile, debris having a relatively small size and remaining in the air passing through the suction motor 140 may be filtered out by the second filter 420. Therefore, it is possible to prevent the dust and debris introduced into the cleaner main body 100 from being discharged to the outside of the cleaner main body 100.

**[0133]** Meanwhile, in a cleaner main body in the related art, a HEPA filter is provided on an air discharge cover, and a prefilter is provided in a main body housing.

**[0134]** For this reason, in order to separate and wash the filter, a user needs to separate the air discharge cover,

disassemble the air discharge cover, and separate the HEPA filter. In addition, there is a limitation in gripping the prefilter in the state in which the air discharge cover is separated. In addition, because debris is attached to the prefilter and the HEPA filter, there is a problem in that the debris is attached to the user's hand in case that the user grips the filter. In addition, the user cannot recognize a method of separating the HEPA filter and the prefilter.

[0135] There is a cleaner in which a HEPA filter and a prefilter are integrated to solve the above-mentioned problem.

[0136] However, in case that the HEPA filter and the prefilter are integrated, the HEPA filter cannot be washed with water, unlike the prefilter that may be washed with water. As a result, it is difficult to clean the filter.

[0137] In addition, because replacement cycles for the HEPA filter and the prefilter are different, any one of the HEPA filter and the prefilter, for which the replacement cycle remains, needs to be replaced in advance, which leads to an economic burden on the user.

[0138] In order to collectively solve the above-mentioned problems, in the cleaner main body 100 according to the embodiment of the present disclosure, a plurality of filters may be separably coupled to the cleaner main body 100 and configured such that any one filter is separated and then another filter is separated.

[0139] Hereinafter, specific structures and separation processes according to the embodiment will be described.

[0140] FIG. 5 is a perspective view for explaining a filter part of a cleaner according to a first embodiment of the present disclosure.

[0141] The filter part 400 according to the first embodiment of the present disclosure will be described below with reference to FIGS. 3 to 5.

[0142] The filter part 400 according to the first embodiment of the present disclosure includes the first filter 410 and the second filter 420.

[0143] The first filter 410 may filter out debris from the air that passes through the dust separating part 130 and is introduced into the suction motor 140. The first filter 410 may refer to a filter configured to filter out debris (dust), such as fur, lint, and hair, having relatively large sizes. For example, the first filter 410 may be a prefilter.

[0144] The first filter 410 may be disposed in the flow path configured to connect the dust separating part 130 and the suction motor 140. Specifically, the first filter 410 may be disposed at the position that surrounds the outer side of the outer peripheral surface of the suction motor 140.

[0145] The first filter 410 includes a first filter housing 411, a first filter portion 412, guide ribs 413, a grip portion 414, and a second filter accommodation portion 415.

[0146] The first filter housing 411 may be formed to surround an outer peripheral surface of the suction motor 140. For example, the first filter housing 411 may be formed in a cylindrical shape, i.e., a shape in which a plurality of holes are formed in a circumferential direction.

[0147] The first filter portion 412 may be provided to surround an outer peripheral surface of the first filter housing 411. That is, the first filter portion 412 may be provided in a cylindrical shape that surrounds the outer peripheral surface of the first filter housing 411. The first filter portion 412 may be made of a material that may filter out debris, such as fur, lint, and hair, with a relatively large size.

[0148] The guide ribs 413 may be provided as a plurality of guide ribs 413 extending in the longitudinal direction from the first filter housing 411, and the guide ribs 413 may guide the coupling of the second filter 420. That is, the plurality of guide ribs 413 may extend in the longitudinal direction from an upper end of the first filter housing 411 based on the longitudinal direction and be disposed at predetermined intervals in the circumferential direction.

[0149] Therefore, in the state in which the first filter 410 and the second filter 420 are separated, the user may easily assemble the first filter 410 and the second filter 420 by inserting the guide ribs 413 into the second filter 420, such that the coupling position of the second filter 420 may be guided.

[0150] Therefore, according to the present disclosure, it is possible to prevent the first filter 410 and the second filter 420 from being erroneously assembled when the user couples the first filter 410 and the second filter 420 again.

[0151] The grip portion 414 may be formed in an annular shape to connect the plurality of guide ribs 413. The grip portion 414 may be disposed above the first filter housing 411 at a predetermined interval.

[0152] In this case, an interval between the grip portion 414 and the first filter housing 411 may be 1 cm or more. This is because the user's finger may be hooked between the grip portion 414 and the first filter housing 411.

[0153] Therefore, the user may hook his/her finger on the grip portion 414 and raise the first filter 410 coupled in the main body housing 110.

[0154] Therefore, according to the present disclosure, the user may easily raise the first filter 410 and separate the first filter 410 from the main body housing 110.

[0155] In addition, according to the present disclosure, when the user grips the first filter 410, the user only needs to hold the grip portion 414, which is relatively less contaminated, without touching the first filter portion 412 to which debris is attached. Therefore, it is possible to prevent debris attached to the first filter 410 from contaminating the user's hand.

[0156] Meanwhile, a diameter of the grip portion 414 may be smaller than an inner diameter of the second filter 420. With this configuration, the grip portion 414 may be accommodated in the second filter 420.

[0157] In addition, the interval between the grip portion 414 and the first filter housing 411 may be equal to a height of the inside of the second filter 420 in the longitudinal direction. With this configuration, the grip portion 414 may stably support the inside of the second filter 420.

**[0158]** In addition, the grip portion 414 may be disposed at the same height as an upper end of the motor accommodation portion 111 of the main body housing 110. With this configuration, it is possible to maximize spatial efficiency in the main body housing 110.

**[0159]** In addition, when the user separates the second filter 420 from the main body housing 110, the grip portion 414 is exposed to the user's eyes, such that the user may easily recognize a method of separating the second filter 420.

**[0160]** The second filter accommodation portion 415 may extend from one side of the first filter housing 411 based on the longitudinal direction and accommodate at least a part of the second filter 420.

**[0161]** For example, the second filter accommodation portion 415 may extend radially outward from the upper end of the first filter housing 411 and then extend upward.

**[0162]** Therefore, the second filter 420 may be accommodated between the second filter accommodation portion 415 and the guide ribs 413.

**[0163]** Therefore, when the first filter 410 and the second filter 420 are coupled, the second filter 420 may be stably coupled to an upper side of the first filter 410.

**[0164]** In addition, because no space is formed between the first filter 410 and the second filter 420, it is possible to prevent debris from being discharged into a space between the first filter 410 and the second filter 420.

**[0165]** The first filter 410 may have at least one sealer 416. The sealer 416 may be made of a rubber or resin material and seal a space between objects.

**[0166]** For example, the sealer 416 may be provided at a lower end of the first filter 410. That is, the sealer 416 may be provided at a lower end of the first filter housing 411. With this configuration, a portion between the first filter 410 and the main body housing 110 may be sealed. Therefore, it is possible to prevent dust in the air from being introduced directly into the suction motor 140.

**[0167]** In addition, the sealer 416 may be provided at the upper side of the first filter 410. Specifically, the sealer 416 may be provided at an upper side of the first filter housing 411. With this configuration, the air, which passes through the first filter portion 412 and is introduced into the suction motor 140, may be prevented from being mixed with the air flowing from the suction motor 140 to a second filter portion 422.

**[0168]** In addition, the sealer 416 may be provided at the outermost side of the first filter 410 or the second filter 420 based on the radial direction.

**[0169]** Therefore, it is possible to prevent the air introduced into the first filter 410 from flowing directly to the air discharge port 151.

**[0170]** In addition, the sealer 416 may be provided between the first filter 410 and the second filter 420. Specifically, the sealer 416 may be provided at a lower end of a second filter housing 421 and seal a portion between the lower end of the second filter housing 421 and the first filter 410.

**[0171]** Therefore, it is possible to prevent the air, which passes through the first filter 410, and the air, which passes through the second filter 420, from being mixed. Therefore, it is possible to prevent debris contained in the air from leaking to the outside of the cleaner 1.

**[0172]** In addition, the sealer 416 may be provided between the second filter 420 and the air discharge cover 150. Specifically, the annular sealer 416 may be provided at a lower end of the air discharge cover 150.

**[0173]** With this configuration, it is possible to prevent the air having passed through the filter part 400 from being introduced into the printed circuit board (not illustrated) provided in the air discharge cover 150.

**[0174]** The second filter 420 may filter out debris from the air that passes through the dust separating part 130 and is introduced into the suction motor 140. The second filter 420 may refer to a filter configured to filter out fine dust having relatively small sizes. For example, the second filter 420 may be an HEPA filter.

**[0175]** The second filter 420 may be disposed in the flow path configured to connect the suction motor 140 and the air discharge port 151. Specifically, the second filter 410 may be disposed at the position that surrounds the outer side of the outer peripheral surface of the suction motor 140.

**[0176]** The second filter 420 may be disposed above the first filter 410. Specifically, the second filter 420 may be coupled to an upper side of the second filter accommodation portion 415 of the first filter 410. In addition, the second filter 420 may be disposed radially outside the guide rib 413.

**[0177]** The second filter 420 may be disposed below the air discharge cover 150.

**[0178]** That is, the first filter 410 and the second filter 420 may be separably coupled in the main body housing 110. Further, the first filter 410 and the second filter 420 may be coupled to surround an outer portion of the motor accommodation portion 111.

**[0179]** The second filter 420 includes the second filter housing 421 and the second filter portion 422.

**[0180]** The second filter housing 421 may be formed to surround the outer peripheral surface of the suction motor 140. For example, the second filter housing 421 may be formed in a cylindrical shape, i.e., a shape in which a plurality of holes are formed in the circumferential direction.

**[0181]** In this case, an inner diameter of the second filter housing 421 may be equal to or larger than an inner diameter of the first filter housing 411.

**[0182]** With this configuration, when the first filter 410 and the second filter 420 are coupled, the guide ribs 413 may be inserted into the second filter housing 421.

**[0183]** The second filter portion 422 may be provided to surround an outer peripheral surface of the second filter housing 421. That is, the second filter portion 422 may be provided in a cylindrical shape that surrounds the outer peripheral surface of the second filter housing 421. The second filter portion 422 may be made of a material that

may filter out fine dust with a relatively small size.

**[0184]** Meanwhile, a process of separating the first filter 410 and the second filter 420 and coupling the first filter 410 and the second filter 420 again in the cleaner 1 according to the present disclosure will be described below.

**[0185]** In the case of the cleaner 1 according to the present disclosure, the user may open a space in the main body housing 110 by opening the air discharge cover 150.

**[0186]** The second filter 420 may be exposed in the main body housing 110 when the air discharge cover 150 is opened. In this case, the user may raise the second filter 420 and separate the second filter 420 from the main body housing 110.

**[0187]** Meanwhile, in the present disclosure, a direction in which the user separates the second filter 420 may be an axial direction of the suction motor 140. That is, the separation direction of the second filter 420 may be a direction of a rotary shaft of the impeller of the suction motor 140.

**[0188]** In this case, because the axial direction of the suction motor 140 is a direction intersecting the longitudinal direction of the suction part 120, the separation direction of the second filter 420 may be a direction intersecting the longitudinal direction of the suction part 120.

**[0189]** When the user separates the second filter 420 from the main body housing 110, the guide ribs 413 and the grip portion 414 may be exposed. In this case, the user may raise the first filter 410 and separate the first filter 410 from the main body housing 110.

**[0190]** Therefore, according to the present disclosure, the first filter 410 is configured to be separated from the main body housing 110 after the second filter 420 is separated from the main body housing 110.

**[0191]** Meanwhile, in the present disclosure, a direction in which the user separates the first filter 410 may be the axial direction of the suction motor 140. That is, the separation direction of the first filter 410 may be the direction of the rotary shaft of the impeller of the suction motor 140.

**[0192]** In this case, because the axial direction of the suction motor 140 is the direction intersecting the longitudinal direction of the suction part 120, the separation direction of the first filter 410 may be a direction intersecting the longitudinal direction of the suction part 120.

**[0193]** Therefore, the user may separate the first filter 410 and the second filter 420 by raising the first filter 410 and the second filter 420 in a direction perpendicular to the ground surface in a state in which the dust bin 170 of the cleaner 1 stands on the ground surface. Therefore, the user may easily separate the first filter 410 and the second filter 420.

**[0194]** Therefore, the first filter 410 and the second filter 420 may be separately separated and washed.

**[0195]** Therefore, it is possible to separately wash one of the first filter 410 or the second filter 420 that can be

washed with water.

**[0196]** In addition, the first and second filters 410 and 420 with different washing or replacement cycles may be separately managed.

**[0197]** Meanwhile, in case that the user intends to couple the filter part 400 again, the user may couple the first filter 410, which has a relatively long axial length, to the main body housing 110 first in the state in which the air discharge cover 150 is open, and then the user may completely assemble the filter part 400 by simply coupling the second filter 420 to the upper side of the first filter 410. In particular, because the guide ribs 413 are provided in the case of the present embodiment, the user may easily recognize the coupling positions of the first filter 410 and the second filter 420.

**[0198]** On the contrary, in the present embodiment, the filter part 400 may be coupled into the main body housing 110 in a state in which the first filter 410 and the second filter 420 are coupled first. That is, the user may couple the first filter 410 and the second filter 420 by inserting the guide ribs 413 of the first filter 410 into the inner peripheral surface of the second filter 420 and couple the coupled filter part 400 into the internal space of the main body housing 110 at once.

**[0199]** Therefore, according to the present disclosure, the user may easily assemble the filter part 400 to the main body housing 110, and it is possible to prevent the filter part 400 from being erroneously assembled.

**[0200]** Meanwhile, FIG. 6 is a perspective view for explaining a filter part of a cleaner according to a second embodiment of the present disclosure, FIG. 7 is a perspective view for explaining a state in which a second filter of the cleaner according to the second embodiment of the present disclosure is raised, and FIG. 8 is a cross-sectional view for explaining a state in which a position of a first filter of the cleaner according to the second embodiment of the present disclosure is maintained.

**[0201]** In order to avoid the repeated description, the description of the configuration and effect of the cleaner according to the first embodiment of the present disclosure may be applied except for components particularly described in the present embodiment.

**[0202]** In the cleaner according to the present embodiment, a main body housing 1110 further includes a filter stopper 1112.

**[0203]** The filter stopper 1112 may protrude from an outer peripheral surface of the motor accommodation portion 1111. For example, the filter stopper 1112 may protrude in the circumferential direction from the outer peripheral surface of the motor accommodation portion 1111.

**[0204]** Meanwhile, in the cleaner according to the present embodiment, a first filter 1410 includes a first filter housing 1411, a first filter portion 1412, and a position fixing portion 1413.

**[0205]** The first filter housing 1411 may be formed to surround the outer peripheral surface of the suction motor 140. For example, the first filter housing 1411

may be formed in a cylindrical shape, i.e., a shape in which a plurality of holes are formed in a circumferential direction.

**[0206]** Meanwhile, in the present embodiment, a hole, to which a hook portion 1423 to be described below is coupled by a hook engagement, may be formed at an upper end of the first filter housing 1411.

**[0207]** The first filter portion 1412 may be provided to surround an outer peripheral surface of the first filter housing 1411. That is, the first filter portion 1412 may be provided in a cylindrical shape that surrounds the outer peripheral surface of the first filter housing 1411. The first filter portion 1412 may be made of a material that may filter out debris, such as fur, lint, and hair, with a relatively large size.

**[0208]** The position fixing portion 1413 may protrude from an inner peripheral surface of the first filter housing 1411. For example, the position fixing portion 1413 may protrude from a lower end of the inner peripheral surface of the first filter housing 1411.

**[0209]** The position fixing portion 1413 may be disposed below the filter stopper 1112 in a state in which the first filter 1410 is coupled to a cleaner main body 1110.

**[0210]** With this configuration, the position fixing portion 1413 may come into contact with and be supported by the filter stopper 1112 when the first filter 1410 moves upward.

**[0211]** With this configuration, a movement of the first filter 1410 may be restricted by the position fixing portion 1413 when the first filter 1410 moves upward.

**[0212]** In the present embodiment, a second filter 1420 further includes the hook portion 1423.

**[0213]** The hook portion 1423 may be provided as a plurality of hook portions 1423 extending in the longitudinal direction from a second filter housing 1421, and the plurality of hook portions 1423 may be coupled to the first filter 1410 by a hook engagement. For example, the hook portion 1423 may extend downward in the longitudinal direction from a lower end of the second filter housing 1421.

**[0214]** The hook portion 1423 may be uncoupled from the first filter 1410 in accordance with the user's selection. For example, the hook portions 1423 may be configured as a pair of hooks extending in parallel with each other. The user may compress the pair of hooks with his/her fingers and separate the pair of hooks from the first filter 1410.

**[0215]** In the cleaner 1 according to the present embodiment, the user may separate the second filter 1420 from the main body housing 110 by raising the second filter 1420 in the state in which the air discharge cover 150 is open.

**[0216]** In this case, when the second filter 1420 is raised and separated from the main body housing 1110, the first filter 1410 is caught by the hook portions 1423, such that the first filter 1410 may also be moved upward.

**[0217]** Meanwhile, in case that the first filter 1410,

together with the second filter 1420, is moved upward to a predetermined position, the position fixing portion 1413 may be caught and fixed by the filter stopper 1112.

**[0218]** Therefore, the user may raise the second filter 1420 and identify a contaminated state of the first filter 1410. That is, in case that the user raises the second filter 1420, the first filter 1410 may be moved upward to a position at which the position fixing portion 1413 is caught by the filter stopper 1112. Further, the user may identify a contaminated state of the first filter 1410 even without separating the first filter 1410 from the main body housing 1110.

**[0219]** In this case, in case that the user determines that the first filter 1410 is required to be replaced or washed, the user may raise the second filter 1420 together with the first filter 1410 and separate the second filter 1420 from the main body housing 1110.

**[0220]** Meanwhile, in case that the user determines that only the second filter 1420 is required to be replaced or washed and the first filter 1410 is not required to be replaced or washed, the user may push the hook portions 1423 of the second filter 1420 and separate the second filter 1420 from the first filter 1410 separately.

**[0221]** That is, in case that the second filter 1420 is moved by a predetermined distance or longer toward the upper side of the main body housing 1110, the first filter 1410 may be caught by the filter stopper 1112, and the hook portions 1423 may be separated from the first filter 1410.

**[0222]** Therefore, the user may separate both the first filter 1410 and the second filter 1420 by raising only the second filter 1420. In addition, as necessary, the user may separate only the second filter 1420 by raising the second filter 1420.

**[0223]** Meanwhile, FIG. 9 is a side view for explaining a filter part of a cleaner according to a third embodiment of the present disclosure, FIG. 10 is a partial cross-sectional view of FIG. 9, and FIG. 11 is a cross-sectional view for explaining the cleaner according to the third embodiment of the present disclosure.

**[0224]** In order to avoid the repeated description, the description of the configuration and effect of the cleaner according to the first embodiment of the present disclosure may be applied except for components particularly described in the present embodiment.

**[0225]** In the present embodiment, a filter part 2400 includes a filter 2410 configured to filter out debris from air introduced into a suction motor 2140, and a sound absorbent 2420 configured to reduce noise of the air that is discharged while passing through the suction motor 2140.

**[0226]** The filter 2410 may filter out debris from the air that passes through the dust separating part 130 and is introduced into the suction motor 2140.

**[0227]** In the present embodiment, the filter 2410 includes a filter housing 2411, a first filter 2412, and a second filter 2413.

**[0228]** The filter housing 2411 may be formed to sur-

round an outer peripheral surface of the suction motor 2140. For example, the filter housing 2411 may be formed in a cylindrical shape, i.e., a shape in which a plurality of holes are formed in a circumferential direction.

**[0229]** The first filter 2412 may be provided to surround an outer peripheral surface of the filter housing 2411. That is, the first filter 2412 may be provided in a cylindrical shape that surrounds the outer peripheral surface of the filter housing 2411. The first filter 2412 may refer to a filter configured to filter out debris (dust), such as fur, lint, and hair, having relatively large sizes. For example, the first filter 2412 may be a prefilter.

**[0230]** The second filter 2413 may be disposed between the first filter 2412 and the filter housing 2411. The second filter 2413 may be provided in a cylindrical shape that surrounds the outer peripheral surface of the filter housing 2411. The second filter 2413 may refer to a filter configured to filter out fine dust having relatively small sizes. For example, the second filter 2413 may be an HEPA filter.

**[0231]** With this configuration, in the present embodiment, the prefilter and the HEPA filter may be integrated, such that the prefilter and the HEPA filter may be separated at once. Therefore, in the present embodiment, it is possible to ensure a space in which the sound absorbent 2420 may be additionally coupled.

**[0232]** The sound absorbent 2420 may reduce noise caused by the air that passes through the dust separating part 130 and is introduced into the suction motor 2140. Because the specific material of the sound absorbent 2420 has been already publicly known, a detailed description thereof will be omitted.

**[0233]** The sound absorbent 2420 may be disposed in a flow path configured to connect the suction motor 2140 and an air discharge port 2151. Specifically, the sound absorbent 2420 may be disposed at a position that surrounds an outer side of an outer peripheral surface of the suction motor 2140.

**[0234]** The sound absorbent 2420 may be disposed above the filter 2410.

**[0235]** The sound absorbent 2420 may be disposed below an air discharge cover 2150.

**[0236]** That is, the filter 2410 and the sound absorbent 2420 may be separably coupled in a main body housing 2110.

**[0237]** With this configuration, in the present embodiment, the filter 2410 may be separated from the main body housing 2110 after the sound absorbent 2420 is separated from the main body housing 2110.

**[0238]** According to the present embodiment, there is an advantage in that the sound absorbent 2420 may be additionally provided. Therefore, it is possible to reduce noise generated by the suction motor 2140.

**[0239]** Meanwhile, the filter 2410 and the sound absorbent 2420 may be separated in an axial direction of the suction motor 2140. That is, the filter 2410 and the sound absorbent 2420 may be separated in a direction intersecting a longitudinal direction of a suction part 2120.

**[0240]** Meanwhile, FIG. 12 is a perspective view for explaining a state in which an air discharge cover of a cleaner according to a fourth embodiment of the present disclosure is open.

**[0241]** In order to avoid the repeated description, the description of the configuration and effect of the cleaner according to the first embodiment of the present disclosure may be applied except for components particularly described in the present embodiment.

**[0242]** In the cleaner of the present embodiment, a second filter 3420 may be separably coupled to an air discharge cover 3150. That is, in the present embodiment, in case that the air discharge cover 3150 is separated from a main body housing 3110, a second filter 3150, together with the air discharge cover 3150, may be separated from the main body housing 3110.

**[0243]** With this configuration, the user may separate the second filter 3420 together with the air discharge cover 3150 only by the operation of opening the air discharge cover 3150.

**[0244]** Therefore, both a first filter 3410 and the second filter 3420 are exposed to the user in a state in which the air discharge cover 3150 is open. Therefore, according to the present embodiment, the user may selectively separate the first filter 3410 or the second filter 3420.

**[0245]** Therefore, according to the present embodiment, it is possible to easily separate the first filter 3410 or the second filter 3420 only by the simple operation of opening the air discharge cover 3150.

**[0246]** Meanwhile, FIG. 13 is a perspective view for explaining a structure of a filter of a cleaner according to a fifth embodiment of the present disclosure.

**[0247]** In order to avoid the repeated description, the description of the configuration and effect of the cleaner according to the first embodiment of the present disclosure may be applied except for components particularly described in the present embodiment.

**[0248]** In the present embodiment, the first filter 410 includes a guide rib 413'.

**[0249]** The guide rib 413' may be provided as a plurality of guide ribs 413' extending in the longitudinal direction from an upper end of an outer peripheral surface of the second filter accommodation portion 415, and the plurality of guide ribs 413' may guide the coupling of the second filter 420. That is, the plurality of guide ribs 413' may extend in the longitudinal direction from the upper end of the outer peripheral surface of the second filter accommodation portion 415 may be disposed at predetermined intervals in the circumferential direction.

**[0250]** Therefore, in the state in which the first filter 410 and the second filter 420 are separated, the user may easily assemble the second filter 420 by coupling the second filter 420 into the guide rib 413', such that the coupling position of the second filter 420 may be guided.

**[0251]** Therefore, according to the present disclosure, it is possible to prevent the first filter 410 and the second filter 420 from being erroneously assembled when the user couples the first filter 410 and the second filter 420

again.

[0252] Meanwhile, FIG. 14 is a perspective view for explaining a structure of a filter of a cleaner according to a sixth embodiment of the present disclosure.

[0253] In order to avoid the repeated description, the description of the configuration and effect of the cleaner according to the first embodiment of the present disclosure may be applied except for components particularly described in the present embodiment.

[0254] In the present embodiment, the first filter 410 includes a handle 413".

[0255] The handle 413" may be hingedly coupled to the upper end of the outer peripheral surface of the second filter accommodation portion 415. For example, the handle 413" may be formed in a circular arc shape, and two opposite ends of the arc may be rotatably coupled to the upper end of the outer peripheral surface of the second filter accommodation portion 415 (or an extension portion extending in the longitudinal direction from the upper end of the outer peripheral surface of the second filter accommodation portion 415).

[0256] Therefore, the user may easily recognize the handle 413" after separating the second filter 420.

[0257] In addition, the user may raise the first filter 410, which is coupled in the main body housing 110, by holding and raising the handle 413".

[0258] Therefore, according to the present disclosure, the user may easily raise the first filter 410 and separate the first filter 410 from the main body housing 110.

[0259] In addition, according to the present disclosure, when the user grips the first filter 410, the user only needs to hold the handle 413", which is relatively less contaminated, without touching the first filter portion 412 to which debris is attached. Therefore, it is possible to prevent debris attached to the first filter 410 from contaminating the user's hand.

[0260] While the present disclosure has been described with reference to the specific embodiments, the specific embodiments are only for specifically explaining the present disclosure, and the present disclosure is not limited to the specific embodiments. It is apparent that the present disclosure may be modified or altered by those skilled in the art without departing from the technical spirit of the present disclosure.

[0261] All the simple modifications or alterations to the present disclosure fall within the scope of the present disclosure, and the specific protection scope of the present disclosure will be defined by the appended claims.

## Claims

### 1. A cleaner (1) comprising:

a main body housing (110);  
an air discharge cover (150) detachably coupled to the main body housing (110) and configured to cover an upper side of the main body housing

(110) of the cleaner (1);

a suction part (120) having a flow path through which air flows;

a dust separating part (130) configured to separate dust from air sucked through the suction part (120);

a suction motor (140) configured to provide a flow force of the air; and

a filter part (400) detachably coupled in the main body housing (110) of the cleaner (1) and disposed to surround an outer portion of the suction motor (140),  
wherein the filter part (400) comprises:

a first filter (410) configured to filter out debris from the air introduced into the suction motor (140); and

a second filter (420) configured to filter out debris from the air that passes through the suction motor (140) and is discharged, wherein the first filter (410) and the second filter (420) are separably coupled, and wherein the first filter (410) is separated from the main body housing (110) after the second filter (420) is separated from the main body housing (110).

### 2. The cleaner (1) of claim 1, wherein the first filter (410) comprises:

a first filter housing (411) formed in a cylindrical shape;

a first filter portion (412) disposed to surround an outer peripheral surface of the first filter housing (411); and

a plurality of guide ribs (413) extending in a longitudinal direction from the first filter housing (411) and configured to guide coupling of the first filter (410) to the second filter (420).

### 3. The cleaner (1) of claim 2, wherein the first filter (410) further comprises a grip portion (414) formed in an annular shape to connect the plurality of guide ribs (413).

### 4. The cleaner (1) of claim 2, wherein the second filter (420) comprises:

a second filter housing (421) formed in a cylindrical shape; and

a second filter portion (422) disposed to surround an outer peripheral surface of the second filter housing (421),

and wherein an inner diameter of the second filter housing (421) is equal to or larger than an inner diameter of the first filter housing (411).

### 5. The cleaner (1) of claim 2, wherein the first filter (410)

- further comprises a second filter accommodation portion (415) extending from one side of the first filter housing (411) based on the longitudinal direction and configured to accommodate at least a part of the second filter (420) 5
6. The cleaner (1) of claim 1, wherein the second filter (420) comprises:
- a second filter housing (421) formed in a cylindrical shape; 10
  - a second filter portion (422) disposed to surround an outer peripheral surface of the second filter housing (421); and
  - a plurality of hook portions (423) extending in a longitudinal direction from the second filter housing (421) and coupled to the first filter (410) by a hook engagement. 15
7. The cleaner (1) of claim 6, wherein the main body housing (110) comprises a motor accommodation portion (111) configured to accommodate the suction motor (140), and 20
- wherein a filter stopper (112) configured to restrict a movement of the first filter (410) is formed on an outer peripheral surface of the motor accommodation portion (111). 25
8. The cleaner (1) of claim 7, wherein when the second filter (420) moves by a predetermined distance or longer toward an upper side of the main body housing (110), the first filter (410) is caught by the filter stopper (112), and the hook portions (423) are separated from the first filter (410). 30
9. The cleaner (1) of claim 1, wherein the first filter (410) is separably coupled to the air discharge cover (150), and 35
- wherein the first filter (410), together with the air discharge cover (150), is separated from the main body housing (110) when the air discharge cover (150) is separated from the main body housing (110). 40
10. The cleaner (1) of claim 1, comprising a sealer (416) disposed between the first filter (410) and the second filter (420) and configured to seal a portion between the first filter (410) and the second filter (420). 45
11. The cleaner (1) of claim 1, wherein the first filter (410) and the second filter (420) are separated from the main body housing (110) in a direction intersecting a longitudinal direction of the suction part (120). 50
12. A cleaner (1) comprising: 55
- a main body housing (110);
  - an air discharge cover (150) detachably coupled to the main body housing (110) and configured to

cover an upper side of the main body housing (110) of the cleaner (1);

a suction part (120) having a flow path through which air flows;

a dust separating part (130) configured to separate dust from air sucked through the suction part (120);

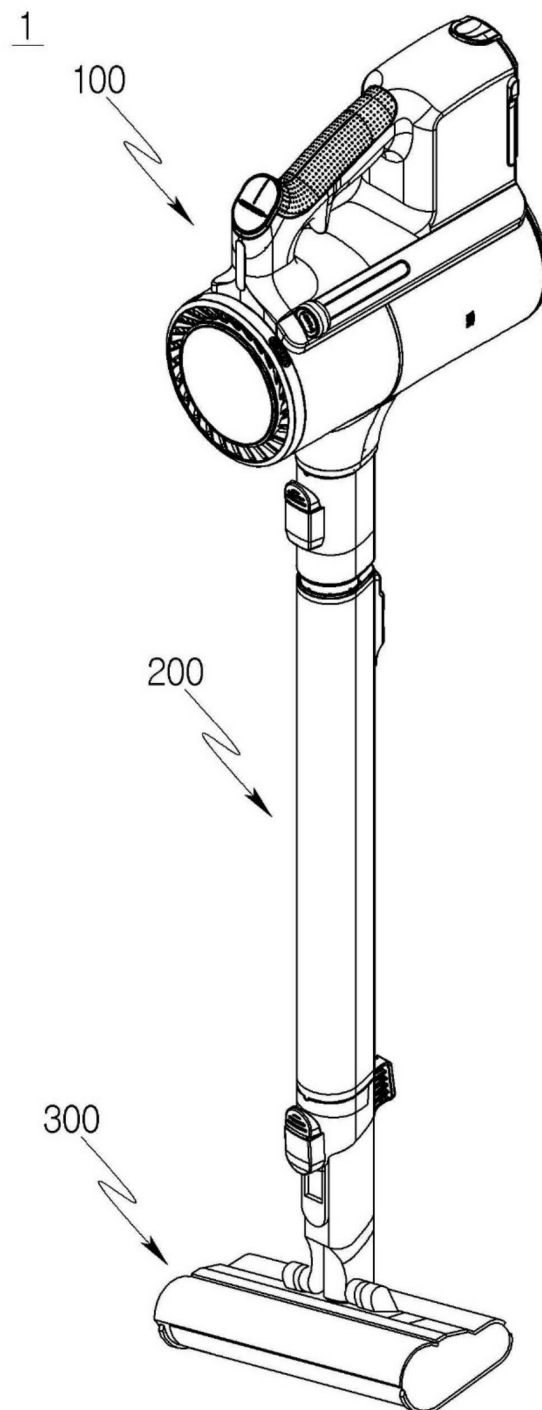
a suction motor (140) configured to provide a flow force of the air; and

a filter part (2400) detachably coupled in the main body housing (110) and disposed to surround an outer portion of the suction motor (140),

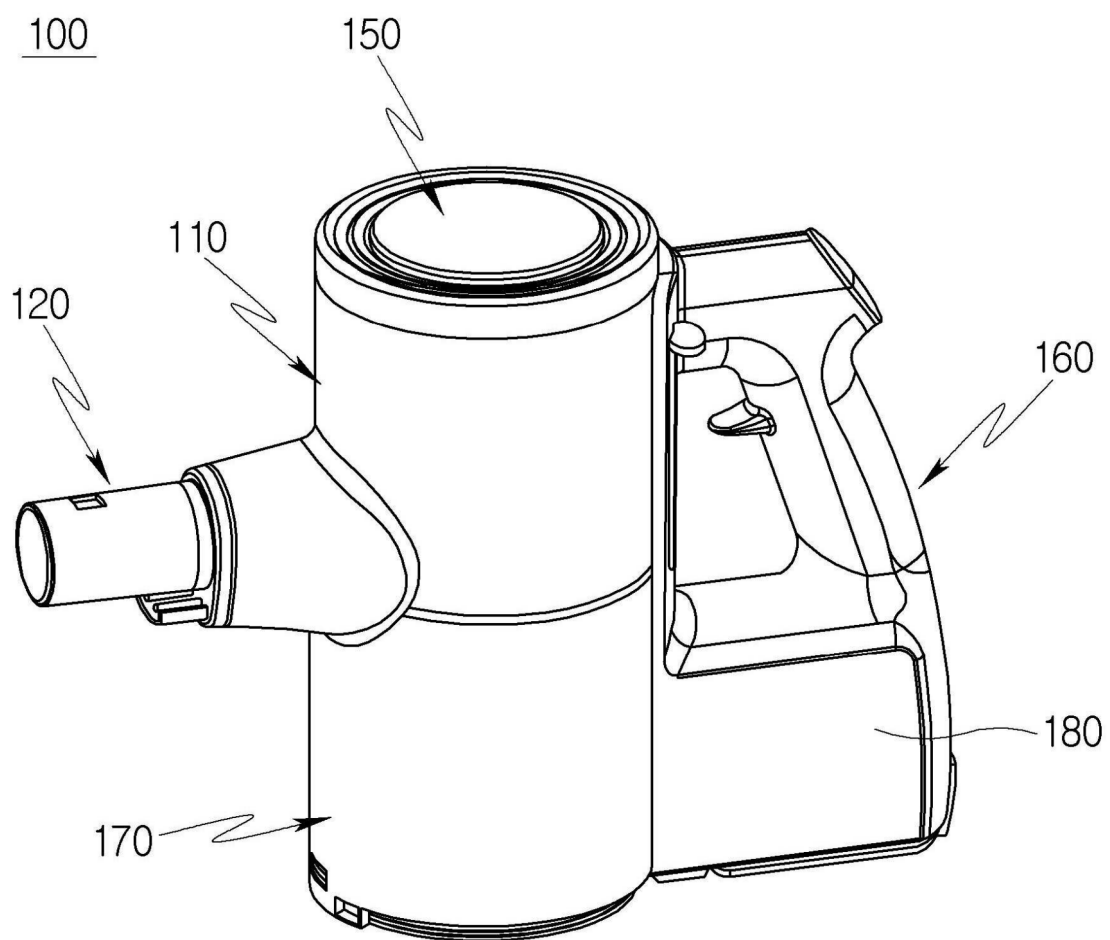
wherein the filter part (2400) comprises:

- a filter (2410) configured to filter out debris from the air introduced into the suction motor (140); and
- a sound absorbent (2420) configured to reduce noise of the air that passes through the suction motor (140) and is discharged, wherein the filter (2410) and the sound absorbent (2420) are separably coupled, and wherein the filter (2410) is separated from the main body housing (110) after the sound absorbent (2420) is separated from the main body housing (110).

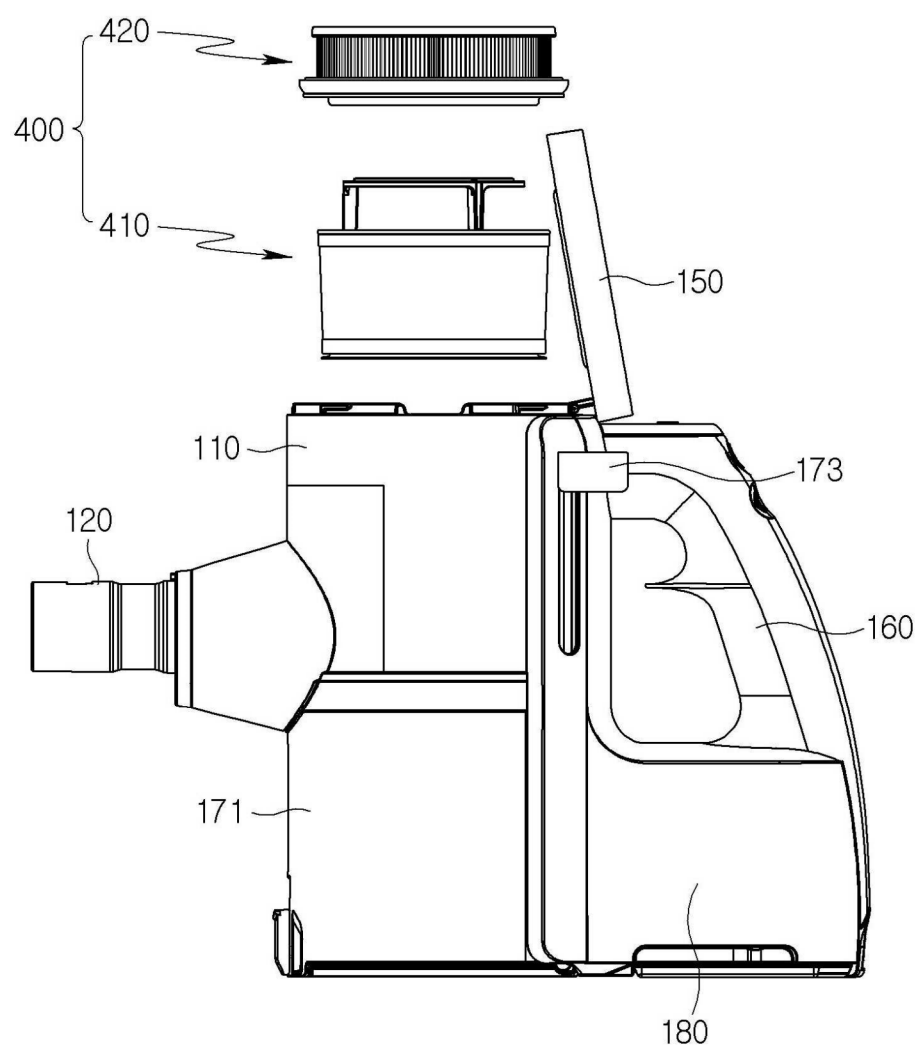
[FIG. 1]



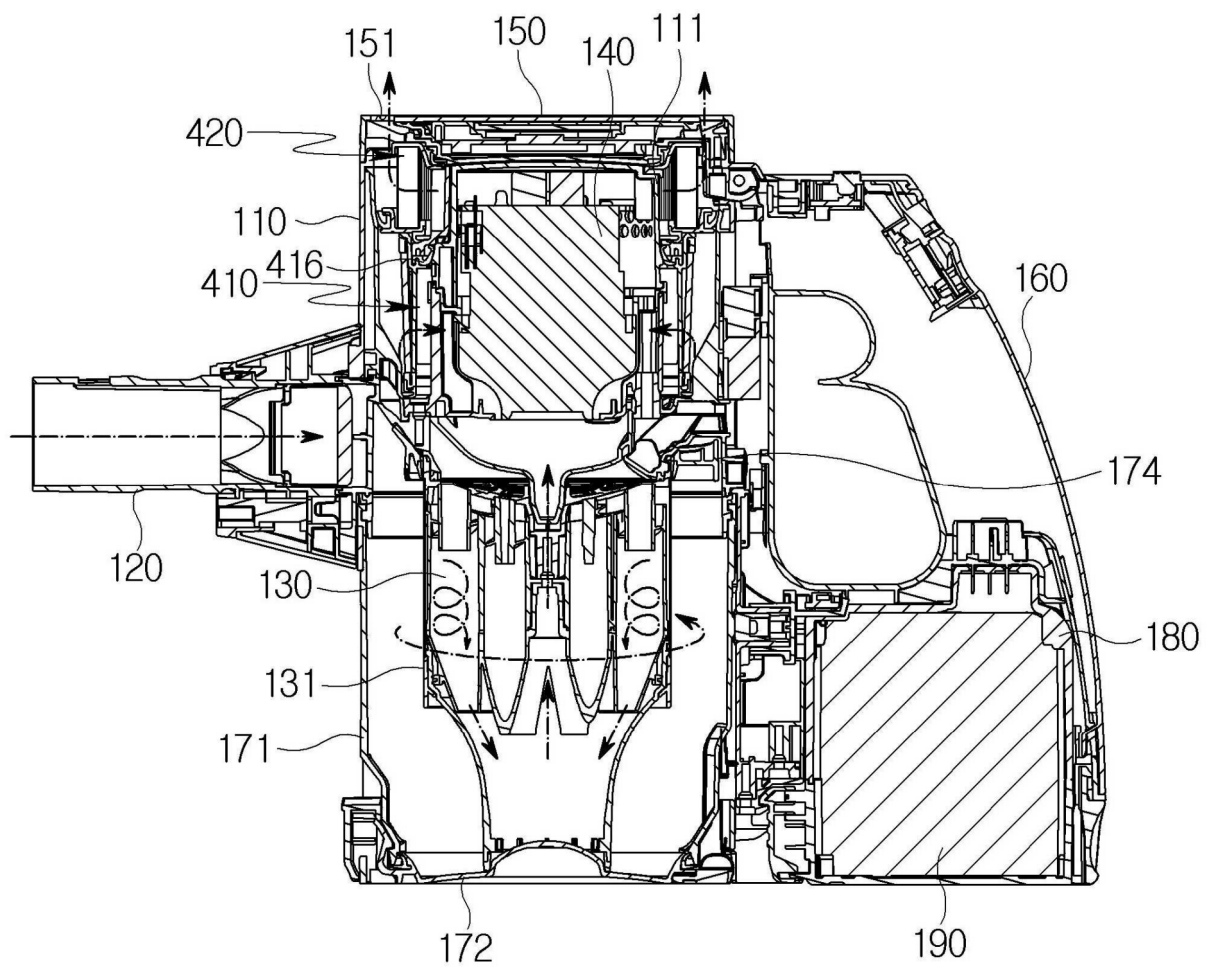
[FIG. 2]



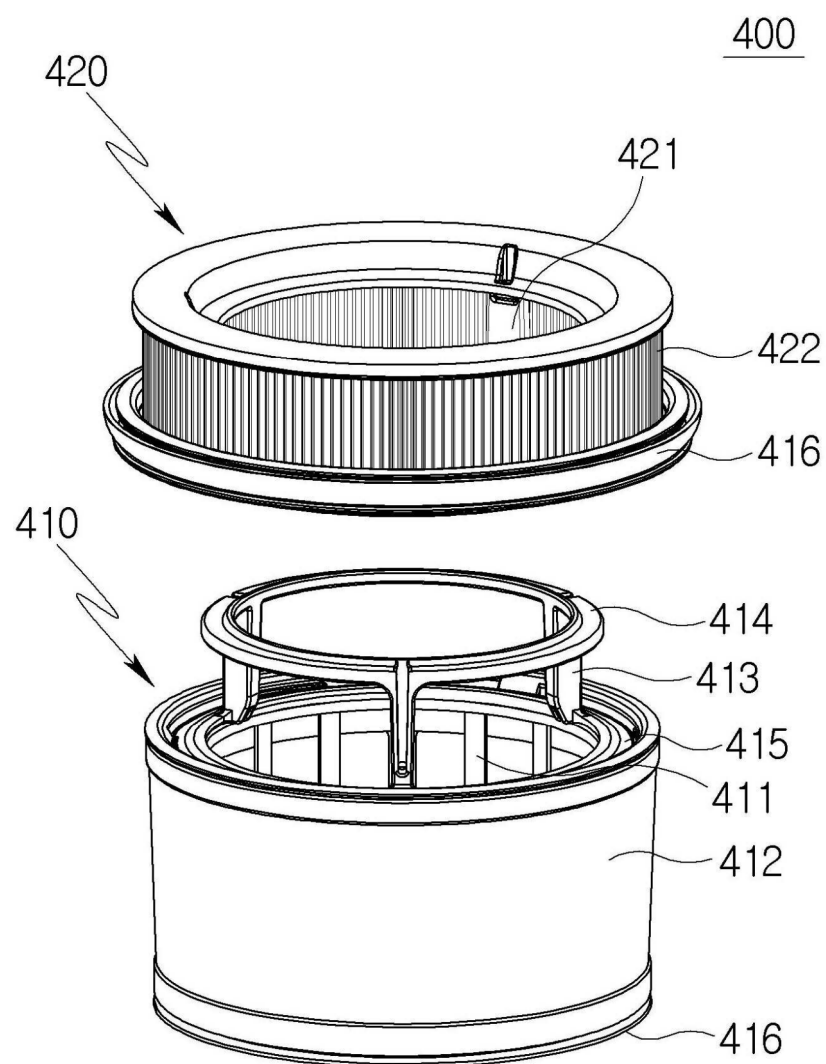
[FIG. 3]



[FIG. 4]

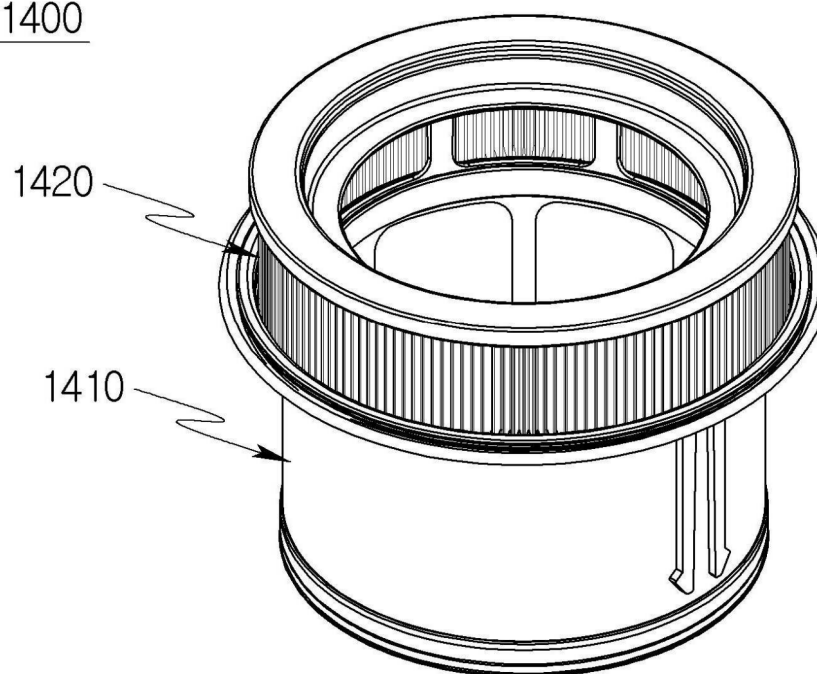


[FIG. 5]

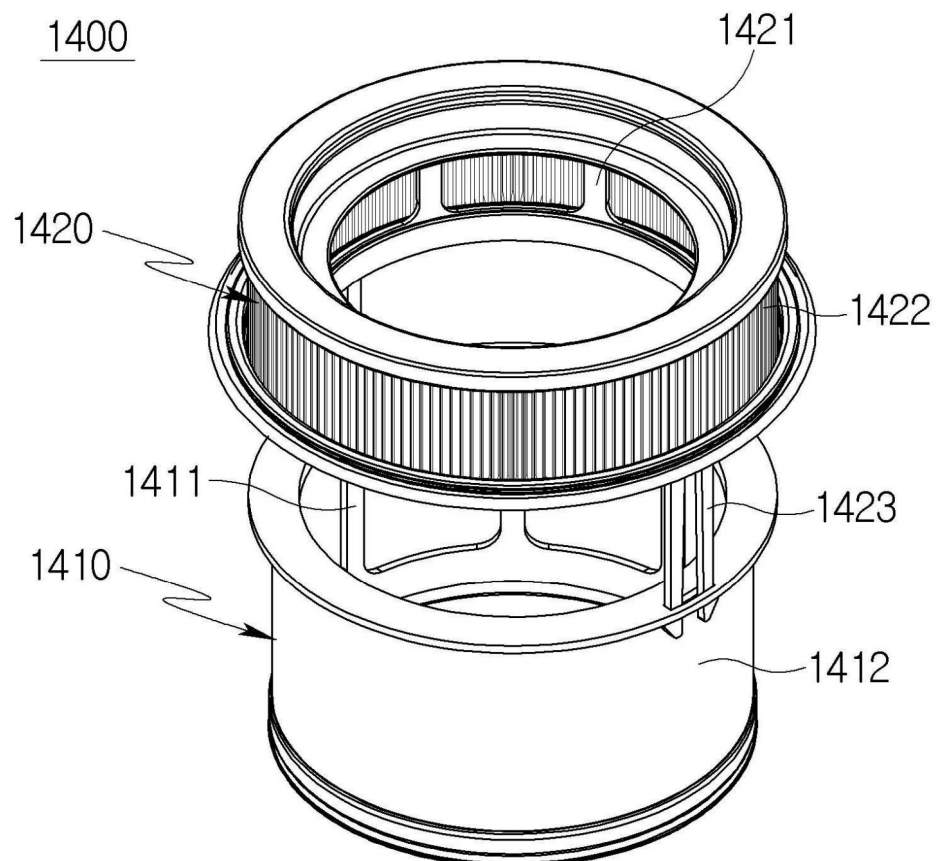


[FIG. 6]

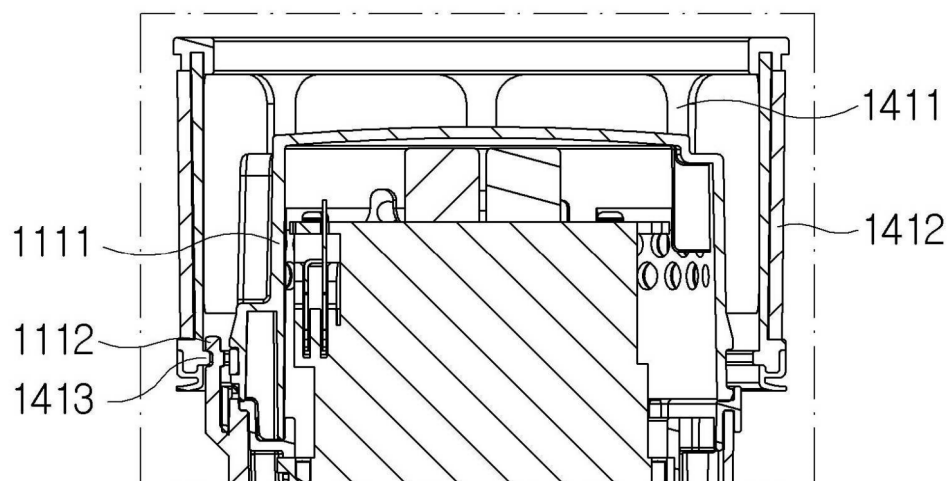
1400



[FIG. 7]

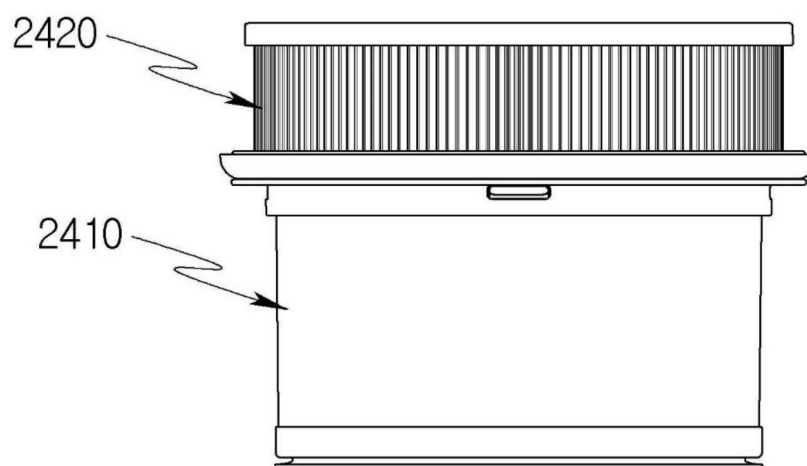


[FIG. 8]



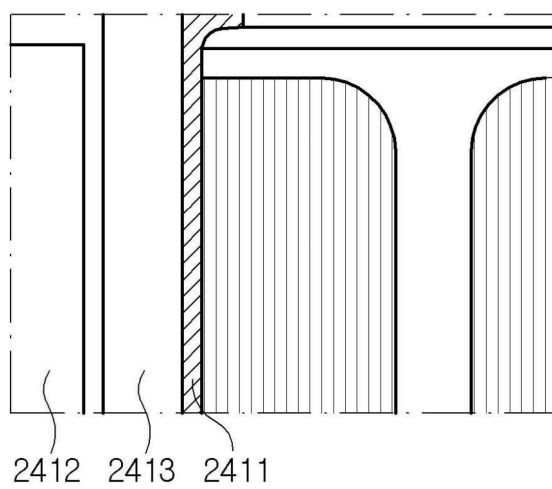
[FIG. 9]

2400

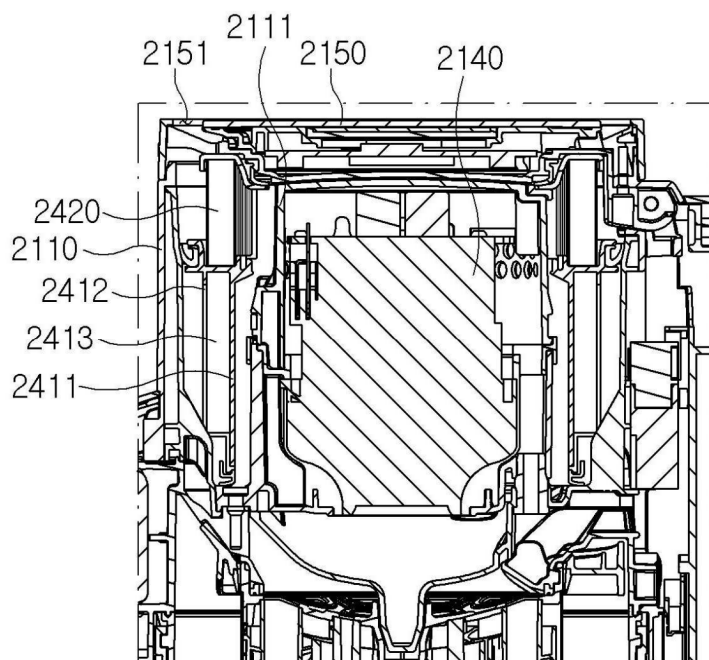


[FIG. 10]

2410

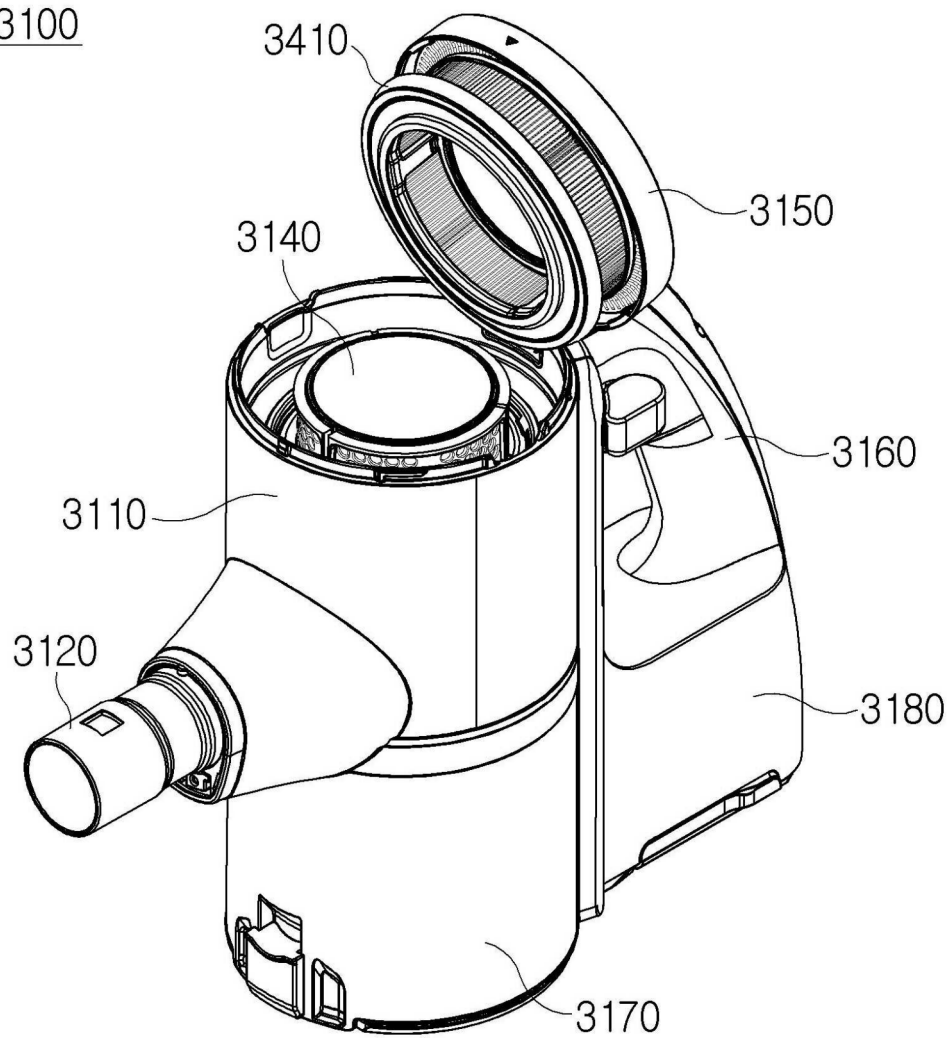


[FIG. 11]

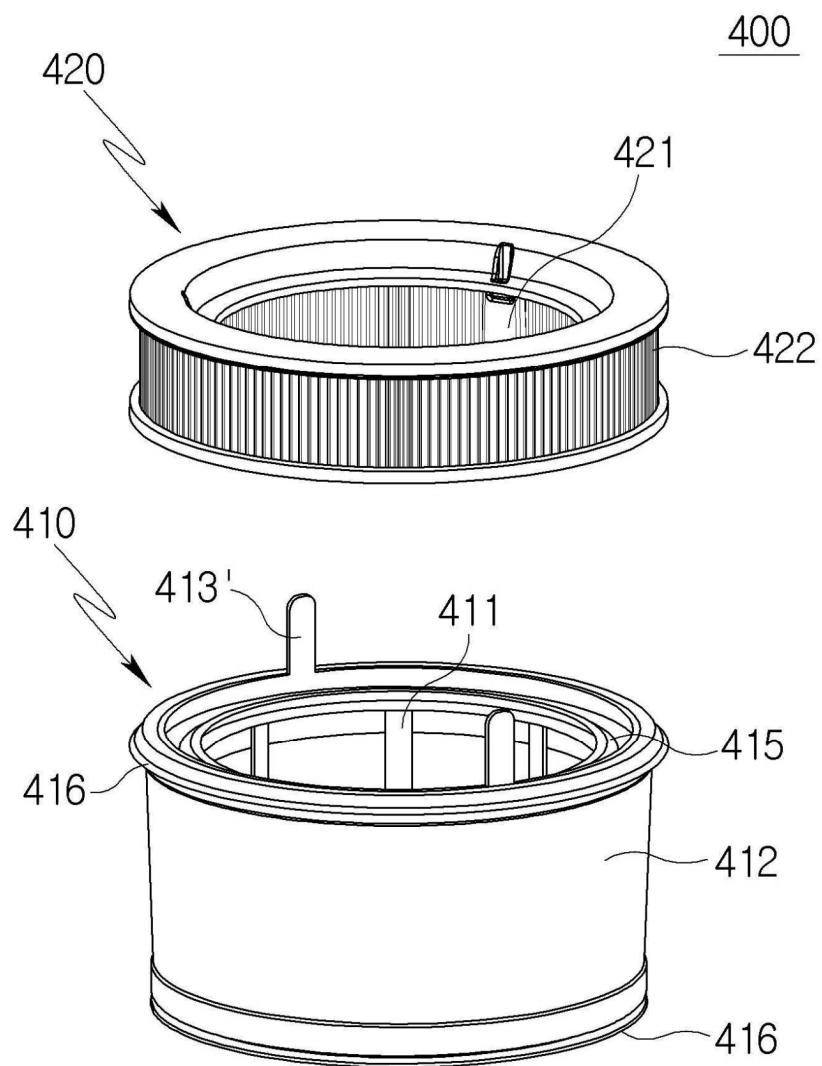


[FIG. 12]

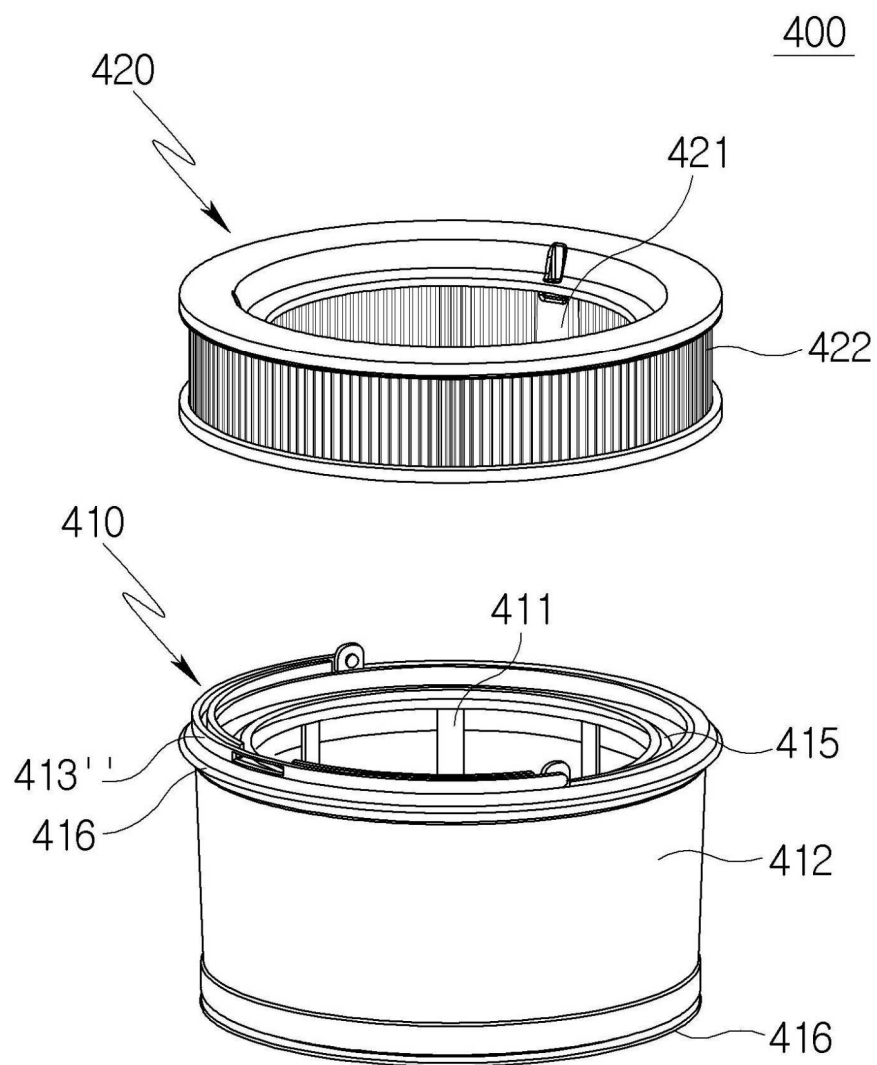
3100



[FIG. 13]



[FIG. 14]



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2024/003281

**A. CLASSIFICATION OF SUBJECT MATTER**

A47L 9/12(2006.01)i; A47L 9/22(2006.01)i; A47L 9/00(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 9/12(2006.01); A47L 11/40(2006.01); A47L 5/24(2006.01); A47L 9/00(2006.01); A47L 9/10(2006.01);  
A47L 9/16(2006.01); A47L 9/28(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), 필터(filter), 소음(noise), 스톱퍼(stopper), 배출 커버  
(discharge cover), 가이드 리브(guide rib), 후크(hook), 실러(sealer)**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                | Relevant to claim No. |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Y<br>A    | KR 10-2022-0050527 A (LG ELECTRONICS INC.) 25 April 2022 (2022-04-25)<br>See paragraphs [0041]-[0135] and figures 1-9.            | 1-7,9-12<br>8         |
| Y         | KR 10-2022-0052603 A (LG ELECTRONICS INC.) 28 April 2022 (2022-04-28)<br>See paragraphs [0105]-[0184] and [0197] and figures 1-9. | 1-7,9-11              |
| Y         | CN 215937256 U (BEIJING DOG VACUUM CLEANER GROUP CO., LTD.) 04 March 2022<br>(2022-03-04)<br>See claims 1 and 9 and figures 3-4.  | 10                    |
| Y         | CN 218128334 U (TINECO INTELLIGENT TECHNOLOGY CO., LTD.) 27 December 2022<br>(2022-12-27)<br>See paragraph [0061] and figure 6.   | 12                    |

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

\* Special categories of cited documents:

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“&amp;” document member of the same patent family

Date of the actual completion of the international search

01 July 2024

Date of mailing of the international search report

03 July 2024

Name and mailing address of the ISA/KR

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Authorized officer

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

INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/KR2024/003281**

|                                        |                                                                                                                 |                       |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------|
| C. DOCUMENTS CONSIDERED TO BE RELEVANT |                                                                                                                 |                       |
| Category*                              | Citation of document, with indication, where appropriate, of the relevant passages                              | Relevant to claim No. |
| A                                      | KR 10-2022-0028748 A (SAMSUNG ELECTRONICS CO., LTD.) 08 March 2022 (2022-03-08)<br>See claim 1 and figures 2-3. | 1-12                  |

## INTERNATIONAL SEARCH REPORT

### Information on patent family members

International application No.

**PCT/KR2024/003281**

| Patent document cited in search report |                 |   | Publication date (day/month/year) | Patent family member(s) |             |    | Publication date (day/month/year) |
|----------------------------------------|-----------------|---|-----------------------------------|-------------------------|-------------|----|-----------------------------------|
| KR                                     | 10-2022-0050527 | A | 25 April 2022                     | WO                      | 2022-080925 | A1 | 21 April 2022                     |
| KR                                     | 10-2022-0052603 | A | 28 April 2022                     | None                    |             |    |                                   |
| CN                                     | 215937256       | U | 04 March 2022                     | None                    |             |    |                                   |
| CN                                     | 218128334       | U | 27 December 2022                  | None                    |             |    |                                   |
| KR                                     | 10-2022-0028748 | A | 08 March 2022                     | WO                      | 2022-045560 | A1 | 03 March 2022                     |

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- KR 2292991 [0010]