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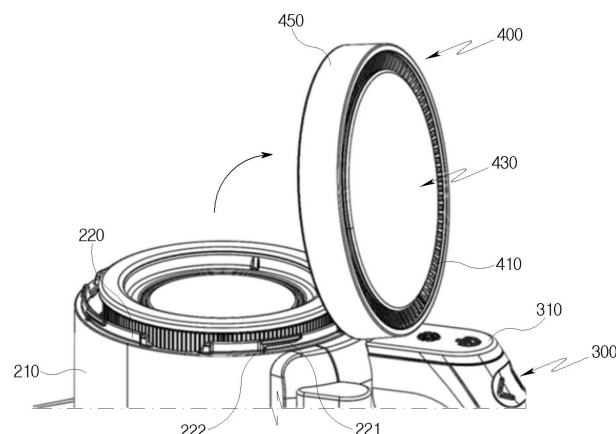
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(54) **CLEANER**

(57) The present disclosure relates to a cleaner including a dust bin configured to store sucked dust, a suction motor configured to generate a suction force toward the inside of the dust bin, a cleaner main body coupled to the dust bin, configured to accommodate the suction motor therein, and having an outer portion to which a handle part is coupled, an exhaust cover installed

to open or close the cleaner main body, and a display module installed on the exhaust cover and having a display panel exposed to the outside of the exhaust cover, in which the exhaust cover has a hinge part and is rotatably installed on the handle part, such that the display panel is installed on the exhaust cover, thereby providing convenience to a user.

[FIG. 4]



Description

[Technical Field]

[0001] The present disclosure relates to a cleaner, and more particularly, to a cleaner in which a display panel is installed on an exhaust cover to provide convenience to a user.

[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 related document, the filter mechanism is configured to be attached to or detached from the main body, and the filter mechanism is completely separated from the main body when the filter mechanism is separated. For this reason, there is a risk of a loss of the filter mechanism, and there is a problem in that a user is inconvenienced when the filter mechanism is attached or detached. In particular, the user may support the main body with one hand and separate the filter mechanism with the other hand. In order to separate the prefilter from the filter mechanism, the main body needs to be mounted at another location, and the user needs to hold the filter mechanism while separating the prefilter and mounting the prefilter again, which may cause inconvenience.

[0013] In addition, in the case of the related document, a state of the cleaner cannot be identified from an external appearance thereof, and the user may identify only local information, such as a remaining charge amount of a battery in the cleaner, through a display device disposed on a handle. For this reason, there is a problem in that it is difficult to transfer various and accurate pieces of information.

[Disclosure]

[Technical Problem]

[0014] The present disclosure has been made in an effort to solve the above-mentioned problem of the cleaner in the related art, and an object of the present disclosure is to provide a cleaner in which an exhaust cover has a hinge part and is rotatably coupled to a cleaner main body, such that the exhaust cover and a filter part are easily managed.

[0015] In addition, another object of the present disclosure is to provide a cleaner in which a display panel is installed on an exhaust cover, such that the display panel having a larger size may be installed, and various accurate pieces of information, such as a state of the cleaner, may be transferred to a user.

[0016] In addition, another object of the present disclosure is to provide a cleaner in which a display panel of an exhaust cover may be connected to a main board through an electric wire and stably supplied with power and signals, thereby improving product reliability.

[0017] In addition, another object of the present disclosure is to provide a cleaner in which the exhaust cover may be fixed at a preset angle when a cleaner main body is opened, which makes it easy to replace a filter part.

[0018] In addition, another object of the present disclosure is to provide a cleaner in which a hinge part of an exhaust cover is disposed such that a cleaner main body minimizes influence on an inner flow path, thereby preventing the inner flow region of the cleaner main body from being obstructed when an exhaust cover is opened or closed.

[0019] In addition, another object of the present disclosure is to provide a cleaner in which an exhaust cover supports a filter part, and a sealing member is installed between the exhaust cover and the filter part, such that the filter part is stably positioned, and the performance of the filter part is improved.

[0020] In addition, another object of the present disclosure is to provide a cleaner in which a display unit installed on an exhaust cover is easily replaced, and accessibility of the display unit to a connector terminal is high, which facilitates software update or the like of the display unit.

[Technical Solution]

[0021] In order to achieve the above-mentioned objects, a cleaner according to the present disclosure may include: a dust bin configured to store sucked dust; a suction motor configured to generate a suction force toward the inside of the dust bin; a cleaner main body coupled to the dust bin, configured to accommodate the suction motor therein, and having an outer portion to which a handle part is coupled; an exhaust cover installed to open or close the cleaner main body; and a display module installed on the exhaust cover and having a display panel exposed to the outside of the exhaust cover, in which the exhaust cover has a hinge part and is rotatably installed on the handle part.

[0022] The handle part may include a main board disposed therein, and the display module may include an electric wire configured to pass through the hinge part and electrically connect the display module to the main board.

[0023] The hinge part may include: a hinge frame protruding from the exhaust cover and inserted into the handle part; and a hinge cover coupled to the hinge frame

and configured to define a space through which the electric wire passes between the hinge cover and the hinge frame.

[0024] The hinge frame may include: an extension portion protruding downward from the exhaust cover and disposed to face an outer side of a filter part; and a hinge coupling portion protruding from a protruding end of the extension portion toward the handle part and rotatably coupled to the handle part.

[0025] A hinge shaft of the hinge part may be positioned on the handle part.

[0026] The exhaust cover may be fixed to the handle part by means of a catching means when the exhaust cover rotates at a preset angle while opening the cleaner main body.

[0027] The catching means may include a catching protrusion protruding from the hinge part and configured to be supported by the cleaner main body to fix an open state of the exhaust cover when the exhaust cover rotates at the preset angle, the cleaner main body may have a hinge part insertion portion into which the hinge part is inserted, the catching protrusion may be positioned in the cleaner main body, and the catching protrusion may pass over the hinge part insertion portion while deforming the hinge part insertion portion and be positioned outside the cleaner main body to fix the open state of the exhaust cover when the exhaust cover rotates.

[0028] The cleaner may further include: a filter part configured to filter air discharged through the exhaust cover, in which the exhaust cover supports the filter part when the exhaust cover closes the cleaner main body.

[0029] The exhaust cover may include a cover main body having at least one exhaust hole through which air is discharged to the outside, the display module may be installed on an upper portion of the cover main body, and the exhaust hole may be formed radially outside the display module.

[0030] The exhaust cover may further include a locking ring rotatably installed on the cover main body and configured to be locked to or unlocked from the cleaner main body while rotating.

[0031] The display module may include: a fixing plate having an upper portion to which the display panel is fixed; a protection panel mounted on the upper portion of the fixing plate and configured to define an external appearance of the exhaust cover; and a panel control board fastened to a lower portion of the fixing plate and electrically connected to the display panel.

[0032] The exhaust cover may further include a sealing member having a hollow shape and installed on a sealing member coupling portion formed on a lower portion of the cover main body, and the sealing member may seal a portion between the exhaust cover and a filter part installed in the cleaner main body.

[0033] The cover main body may have a connector insertion hole formed in the sealing member coupling portion, and the panel control board may have a connector terminal inserted into the connector insertion hole

and configured to be exposed to the outside when the sealing member is detached.

[Advantageous Effects]

[0034] As described above, according to the cleaner according to the present disclosure, the exhaust cover has the hinge part and is rotatably coupled to the cleaner main body, such that the exhaust cover and the filter part are easily managed. That is, it is possible to improve the user convenience and solve the problem in the related art caused when the exhaust cover is completely separated from the cleaner main body.

[0035] In addition, the display panel is installed on the exhaust cover, such that the display panel having a larger size may be installed, and various accurate pieces of information, such as a state of the cleaner, may be transferred to the user, thereby improving the aesthetic appearance of the cleaner.

[0036] In addition, the display panel of the exhaust cover may be connected to the main board through the electric wire and stably supplied with power and signals, thereby improving product reliability with low costs.

[0037] In addition, the exhaust cover may be fixed at the preset angle when the cleaner main body is opened, which makes it easy to replace the filter part.

[0038] In addition, the hinge part of the exhaust cover is disposed such that the cleaner main body minimizes influence on the inner flow path, thereby preventing the inner flow region of the cleaner main body from being obstructed when the exhaust cover is opened or closed.

[0039] In addition, the exhaust cover supports the filter part, and the sealing member is installed between the exhaust cover and the filter part, such that the filter part is stably positioned, and the performance of the filter part is improved.

[0040] In addition, the display unit installed on the exhaust cover is easily replaced, and the accessibility of the display unit to the connector terminal is high, which facilitates software update or the like of the display unit.

[Description of Drawings]

[0041]

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

FIG. 2 is a longitudinal cross-sectional view of the cleaner according to the embodiment of the present disclosure.

FIG. 3 is an enlarged view illustrating a portion of a cleaner main body in FIG. 2 on which an exhaust cover is installed.

FIG. 4 is a perspective view illustrating a state in which the exhaust cover of the cleaner according to the embodiment of the present disclosure is opened.

FIG. 5 is a view illustrating a state in which a filter part is separated after the exhaust cover of the cleaner

according to the embodiment of the present disclosure is opened.

FIG. 6 is a perspective view of the exhaust cover of the cleaner according to the embodiment of the present disclosure.

FIG. 7 is an exploded perspective view of the exhaust cover of the cleaner according to the embodiment of the present disclosure.

FIG. 8 is an enlarged view illustrating a portion in FIG. 3.

FIG. 9 is a view illustrating a state in which the exhaust cover in FIG. 8 is opened.

FIGS. 10 and 11 are views for explaining a catching protrusion of the cleaner according to the embodiment of the present disclosure.

FIG. 12 is a view for explaining a connector insertion hole and a sealing member of the cleaner according to the embodiment of the present disclosure.

[Mode for Invention]

[0042] Hereinafter, exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawings.

[0043] 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.

[0044] 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.

[0045] 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.

[0046] Hereinafter, a cleaner according to the present specification will be described with reference to the accompanying drawings.

[0047] FIG. 1 is a perspective view of a cleaner according to an embodiment of the present disclosure, FIG. 2 is a longitudinal cross-sectional view of the cleaner according to the embodiment of the present disclosure, FIG. 3 is an enlarged view illustrating a portion of a cleaner main body in FIG. 2 on which an exhaust cover is installed, FIG. 4 is a perspective view illustrating a state in which the

exhaust cover of the cleaner according to the embodiment of the present disclosure is opened, FIG. 5 is a view illustrating a state in which a filter part is separated after the exhaust cover of the cleaner according to the embodiment of the present disclosure is opened, FIG. 6 is a perspective view of the exhaust cover of the cleaner according to the embodiment of the present disclosure, FIG. 7 is an exploded perspective view of the exhaust cover of the cleaner according to the embodiment of the present disclosure, FIG. 8 is an enlarged view illustrating a portion in FIG. 3, FIG. 9 is a view illustrating a state in which the exhaust cover in FIG. 8 is opened, FIGS. 10 and 11 are views for explaining a catching protrusion of the cleaner according to the embodiment of the present disclosure, and FIG. 12 is a view for explaining a connector insertion hole and a sealing member of the cleaner according to the embodiment of the present disclosure.

[0048] The cleaner according to the embodiment of the present disclosure may be a cleaner that operates to suck dust-containing air from a cleaning target surface.

[0049] The cleaner according to the embodiment of the present disclosure may include a dust bin 100. The dust bin 100 may include a pipe connector 110 through which dust-containing air is sucked. The pipe connector 110 may guide the dust-containing air to the dust bin 100.

[0050] The cleaner may further include a cleaner main body 200 having a lower side to which the dust bin 100 is coupled, and a handle part 300 coupled to the cleaner main body 200.

[0051] For example, the handle part 300 may be positioned at a side of the cleaner main body 200 opposite to the pipe connector 110. However, the positions of the pipe connector 110 and the handle part 300 are not limited thereto.

[0052] The dust bin 100 may separate dust introduced into the dust bin 100 through the pipe connector 110 and store the separated dust.

[0053] A dust separating part may be positioned in the dust bin 100. The dust separating part may include a first cyclone part 120 that may separate dust by using a cyclone flow. The first cyclone part 120 may communicate with the pipe connector 110.

[0054] The air and dust sucked through the pipe connector 110 may flow approximately spirally or flow in the form of an approximate funnel along an inner circumferential surface of the first cyclone part 120.

[0055] The dust separating part may further include a second cyclone part 130 configured to separate the dust from the air discharged from the first cyclone part 120.

[0056] The second cyclone part 130 may include a plurality of cyclone bodies 131 disposed in parallel. The air may be divided and pass through the plurality of cyclone bodies 131.

[0057] In another example, the dust separating part may have a single cyclone part.

[0058] For example, the dust bin 100 and the cleaner main body 200, which has an lower portion to which the dust bin 100 is coupled, may each be formed in a cylind-

rical shape.

[0059] A lower side of the dust bin 100 may be opened or closed by a body cover that is rotated by a hinge. In another embodiment, the lower side of the dust bin 100 and a dust bin main body may be integrated into a single body.

[0060] A cyclone filter 140 may be positioned in the dust bin 100 and disposed to surround the second cyclone part 130.

[0061] For example, the cyclone filter 140 is formed in a cylindrical shape and guides the air, from which dust is separated by the first cyclone part 120, to the second cyclone part 130. The cyclone filter 140 filters out dust contained in air while the air passes through the cyclone filter 140.

[0062] To this end, the cyclone filter 140 may include a mesh portion 141 having a plurality of holes. The mesh portion 141 may be made of a metallic material. However, the present disclosure is not limited thereto.

[0063] Because the mesh portion 141 filters the air, the dust may be accumulated on the mesh portion 141. Therefore, the mesh portion 141 needs to be cleaned.

[0064] Therefore, in the present disclosure, the cleaner may further include a compression part 150 for cleaning the cyclone filter 140.

[0065] The compression part 150 may include an operating part disposed in the cleaner main body 200 so as to be moving in an upward/downward direction in the dust bin 100, a manipulation part configured to be manipulated by a user to move the operating part in the upward/downward direction, and a transmission part configured to transmit an operating force of the manipulation part to the operating part.

[0066] When the user moves the manipulation part downward, the operating part may simultaneously clean the cyclone filter 140 and compress the dust in the dust bin 100 while moving downward in the downward direction along an outer circumferential surface of the cyclone filter 140.

[0067] The operating part may include a compression plate. The compression plate, which constitutes the operating part, may be made of an elastically deformable material. For example, the compression plate may be made of a rubber material. The compression plate may be formed in a ring shape so that the compression plate may clean an entire circumference of the cylindrical cyclone filter 140. In another example, the compression plate may be made of silicone or a fiber material.

[0068] In the present embodiment, a position of the operating part in a state in which the manipulation part is not manipulated may be referred to as a standby position.

[0069] Further, at the standby position, the compression plate is on standby at a position departing from the cyclone filter 140. During a cleaning process, the compression plate moves in the upward/downward direction while wiping an outer surface of the cyclone filter 140.

[0070] An inner circumferential surface of the compression plate may include a cleaning surface that comes

into contact with an outer surface of the cyclone filter 140 during the cleaning process. The cleaning surface may be a surface, i.e., a vertical surface facing the cyclone filter 140.

[0071] Therefore, when the compression plate moved downward in a state in which the entire cleaning surface is in contact with the circumference of the cyclone filter 140, the cleaning surface removes the dust attached to the outer surface of the cyclone filter 140.

[0072] A suction motor 230 configured to generate a suction force may be accommodated and disposed in the cleaner main body 200. The cleaner main body 200 may have a space in which the suction motor 230 may be accommodated. The cleaner main body 200 may have the space in which the suction motor 230 is accommodated, and the space may be opened upward. Further, an open upper side of the cleaner main body 200 may be opened or closed by an exhaust cover 400 that is rotatably coupled to the handle part 300 and will be described below.

[0073] The cleaner main body 200 may have a locking ring support portion 220 having an upper end on which the exhaust cover 400 is seated, such that the exhaust cover 400 is supported on the upper end. The locking ring support portion 220 may be stepped and protrude from an upper end of the cleaner main body 200, the locking ring support portion 220 may be formed along a circumference of the cleaner main body 200. That is, the locking ring support portion 220 may protrude in a ring shape from the upper end of the cleaner main body 200 and be inserted into a locking ring 450 of the exhaust cover 400. The locking ring 450 of the exhaust cover 400 may be seated on the upper end of the cleaner main body 200.

[0074] In addition, the cleaner main body 200 may have a hinge part insertion portion 210 formed by cutting a part of the upper end so that a hinge part 420 to be described below is inserted into the hinge part insertion portion 210. The hinge part insertion portion 210 may be recessed by a predetermined length from the upper end of the cleaner main body 200, and the hinge part 420 may be inserted into the hinge part insertion portion 210, such that two opposite surfaces of the hinge part 420 based on a direction of a hinge shaft may be supported.

[0075] The hinge part insertion portion 210 may be formed in the cleaner main body 200, and the locking ring support portion 220 may be formed in a ring shape and have a shape formed by cutting a part of the cleaner main body 200. In addition, the locking ring support portion 220 may be formed in a cut ring shape, and a cut portion may be formed at a position corresponding to the hinge part insertion portion 210 of the cleaner main body 200. Further, the locking ring support portion 220 may have protrusion support portions 223 formed as ends of the cut portion protrude radially outward.

[0076] The suction motor 230 may generate a suction force applied from the cleaning target surface toward the inside of the dust bin 100. The suction force generated by the suction motor 230 may be applied to the pipe con-

nector 110.

[0077] The suction motor 230 may be positioned above the dust bin 100 and/or battery 330 based on an extension direction of an axis of the cyclone flow of the first cyclone part 120.

[0078] Meanwhile, in the embodiment of the present disclosure, the extension direction of the axis of the cyclone flow of the first cyclone part 120 or the second cyclone part 130 refers to the upward/downward direction.

[0079] An air guide 240 configured to guide the air, which is discharged from the second cyclone part 130, to the suction motor 230 may be disposed in the cleaner main body 200.

[0080] The second cyclone part 130 may be coupled to a lower side of the air guide 240. The cyclone filter 140 surrounds the second cyclone part 130 in a state in which the cyclone filter 140 is coupled to the second cyclone part 130.

[0081] Therefore, the cyclone filter 140 may also be positioned below the air guide 240.

[0082] A dust guide 160 may be provided below the second cyclone part 130. A lower side of the second cyclone part 130 may be coupled to an upper side of the dust guide 160. In addition, a lower side of the cyclone filter 140 may be seated on the dust guide 160.

[0083] A lower side of the dust guide 160 may be seated on a bottom surface of the dust bin 100. The dust guide 160 is spaced apart from an inner circumferential surface of the dust bin 100 and divides an internal space of the dust bin 100 into a first dust storage portion 161 configured to store the dust separated by the first cyclone part 120, and a second dust storage portion 163 configured to store the dust separated by the second cyclone part 130.

[0084] In the case in which the body cover is provided, the lower side of the dust guide 160 may be seated on the body cover.

[0085] The cleaner may further include a filter part 250 configured to filter the air to be introduced into the suction motor 230. The filter part 250 may include a first filter 251 disposed at a rear end of the suction motor 230 based on a flow direction of the air sucked into the cleaner, and a second filter 252 disposed at a front end of the suction motor 230 based on the flow direction of the air sucked into the cleaner.

[0086] In other words, the filter part 250 may include at least one of the first filter 251, which filters the air discharged through the exhaust cover 400, and the second filter 252 that filters the air to be supplied to a fan provided on the suction motor 230.

[0087] More specifically, the first filter 251 may be a high-efficiency particulate air filter (HEPA filter). The first filter 251 may be disposed in the cleaner main body 200 and surround a part of an upper side of the suction motor 230. The air having passed through the suction motor 230 may pass through the first filter 251 and then be discharged to the outside through an exhaust hole 411.

Therefore, debris may be finally filtered out from the air discharged to the outside of the cleaner.

[0088] In addition, the second filter 252 may be a prefilter. The second filter 252 may be disposed in the cleaner main body 200 and surround a part of a lower side of the suction motor 230. The air discharged from the second cyclone part 130 may flow upward along the air guide 240 and then pass through the second filter 252 and the suction motor 230. Therefore, the suction motor 230 may be protected from fine dust or ultra-fine dust.

[0089] The first filter 251 and the second filter 252 may be disposed in the upward/downward direction, and the first filter 251 may be seated and disposed on an upper portion of the second filter 252. In another example, the first filter 251 may be coupled to the upper portion of the second filter 252. In still another example, the first filter 251 and the second filter 252 may be disposed in the upward/downward direction and integrated.

[0090] In addition, the first filter 251 and the second filter 252 may each include a filter mesh, and a filter frame configured to support the filter mesh. An upper end frame 254 may be provided on an upper portion of the first filter 251 and support the filter mesh of the first filter 251. The upper end frame 254 may be provided in the form of a hollow ring. The upper end frame 254 may protrude radially inward further than the filter mesh of the first filter 251 and be spaced apart from a board seating portion 412b, which will be described below, at an interval in the upward/downward direction.

[0091] The handle part 300 may include a handle body 310 configured to be gripped by the user, and a battery housing 320 disposed below the handle body 310 and configured to accommodate a battery 330.

[0092] In addition, a main board 340 may be disposed in the handle part 300, and the main board 340 may supply power and a control signal to a panel control board 440 to be described below or be supplied with power and a control signal from the panel control board 440. For example, the main board 340 may be disposed at an upper side of the handle part 300 and disposed at a position adjacent to the cleaner main body. However, the present disclosure is not limited thereto. Specifically, the main board 340 may be disposed at a position adjacent to a portion to which the exhaust cover 400 of the handle part 300 is rotatably coupled.

[0093] In addition, an electric wire guide portion 312 configured to guide an electric wire 441 may protrude in the handle part 300, and the electric wire guide portion 312 may be provided between the main board 340 and a hinge cover insertion portion 311. The electric wire guide portion 312 may have a guide hole 312a penetratively formed in a forward/rearward direction. Therefore, the electric wire 441 passes through the hinge part 420 and the guide hole 312a and then is guided to the main board 340, such that the electric wire 441 is prevented from being twisted.

[0094] In addition, the handle part 300 may have the hinge cover insertion portion 311 formed by cutting a part

of a portion coupled to the cleaner main body 200 so that the hinge part 420 to be described below is inserted into the handle body 310. The hinge cover insertion portion 311 may be formed at a position corresponding to the hinge part insertion portion 210. Therefore, the hinge part 420 may be disposed to protrude toward the handle body 310 through the hinge part insertion portion 210 and inserted into the hinge cover insertion portion 311, and the hinge part 420 may be rotatably coupled to the handle body 310 by means of a hinge pin 424.

[0095] The cleaner may further include the exhaust cover 400. The exhaust cover 400 may have a shape illustrated in FIG. 6. The exhaust cover 400 may be rotatably coupled to the handle part 300, and a display panel 431 may be installed on an upper portion of the exhaust cover 400 and exposed to the outside. The exhaust cover 400 may be installed to open or close the upper side of the cleaner main body 200 and have the exhaust hole 411 through which the air introduced into the cleaner main body is discharged to the outside.

[0096] As illustrated in FIG. 7, the exhaust cover 400 may include a cover main body 410, the hinge part 420, a display module 430, the panel control board 440, the locking ring 450, and a sealing member 460.

[0097] The cover main body 410 may be provided to cover the open upper side of the cleaner main body 200 and provided in the form of an approximately circular plate. Further, in a closed state in which the cover main body 410 covers the upper side of the cleaner main body 200, the cover main body 410 may support the filter part 250, and the display module 430 may be installed on an upper portion of the cover main body 410.

[0098] The cover main body 410 may have a module seating portion 412 on which the display module 430 is seated and installed.

[0099] The display module 430 may be installed so as not to obstruct the air being discharged to the outside from the cleaner main body 200, and the display module 430 may be installed on the cover main body 410. The display module 430 may be installed at a position corresponding to the filter part 250 in the upward/downward direction in the state in which the exhaust cover 400 closes the upper side of the cleaner main body 200.

[0100] The module seating portion 412 may be formed as a center of the cover main body 410 protrudes downward. The module seating portion 412 may be formed at a position corresponding to the filter part 250 in the upward/downward direction. For example, an inner diameter of the module seating portion 412 may be equal to or larger than an outer diameter of the filter mesh of the first filter 251.

[0101] In addition, as the center of the cover main body 410 protrudes downward, the module seating portion 412 may have the board seating portion 412b in which the panel control board 440 to be described below is accommodated. In the state in which the exhaust cover 400 covers the upper side of the cleaner main body 200, a lower end of the board seating portion 412b may be

spaced apart from the upper end frame 254 of the filter part 250 at an interval. Further, the sealing member 460 may be inserted between the board seating portion 412b and the upper end frame 254, and a portion between the filter part 250 and the exhaust cover 400 may be sealed in the state in which the exhaust cover 400 covers the upper side of the cleaner main body 200.

[0102] In addition, the module seating portion 412 may have a connector insertion hole 412a into which a connector terminal 442 to be described below is inserted. The connector terminal 442 provided on the panel control board 440 to be described below may be penetratively inserted into the connector insertion hole 412a and exposed to the outside. With the connector insertion hole 412a, the connector terminal 442 may be disposed outside the cover main body 410 or exposed to the outside of the cover main body 410 when the display module 430 is installed on the cover main body 410.

[0103] At least one connector insertion hole 412a may be formed in the module seating portion 412. In addition, the connector insertion hole 412a may be formed through an outer circumferential wall and an inner circumferential wall formed as the center of the cover main body 410 protrudes downward. In addition, the connector insertion hole 412a may be sized such that the connector terminal 442 is inserted into the connector insertion hole 412a. Alternatively, the connector insertion hole 412a may be sized such that the connector terminal 442 is inserted into the connector insertion hole 412a with clearance so that the connector insertion hole 412a has a predetermined gap with the connector terminal 442 when the connector terminal 442 is inserted.

[0104] Further, the exhaust cover 400 may further include the sealing member 460. The sealing member 460 may be positioned between the board seating portion and the upper end frame 254 and seal the portion between the filter part 250 and the exhaust cover 400 when the exhaust cover 400 closes the upper side of the cleaner main body 200. That is, the sealing member 460 may be compressed in the upward/downward direction between a lower portion of the board seating portion 412b and an upper surface of the upper end frame 254 and seal a portion between the inside and outside of the filter part 250, thereby improving the performance of the filter part 250. In addition, the sealing member 460 may allow the exhaust cover 400 to elastically support the filter part 250, thereby increasing a supporting force.

[0105] In addition, the sealing member 460 may be inserted into a sealing member coupling portion 413 provided in the module seating portion 412, and the sealing member 460 may be mounted on the exhaust cover 400.

[0106] The sealing member coupling portion 413 is installed on the outer circumferential wall formed as the center of the cover main body 410 protrudes downward. That is, the sealing member coupling portion 413 may be installed to surround an outer circumferential surface of the module seating portion 412. A ring-shaped

sealing member support portion may be provided at a lower end of the module seating portion 412, protrude radially outward, and be provided along a circumference of the module seating portion 412. The sealing member 460 may be inserted and installed between the cover main body 410 and the sealing member support portion. Alternatively, the module seating portion 412 may be recessed in the outer circumferential surface and have the ring-shaped sealing member coupling portion 413 formed along the circumference of the module seating portion 412. Further, the ring-shaped sealing member 460 may be inserted and seated into the sealing member coupling portion 413.

[0107] The sealing member 460 may be formed to surround the circumference of the module seating portion 412 and fixed to the module seating portion 412 to elastically support the filter part 250. The sealing member 460 may include a sealing member body 461 formed in a ring shape and inserted into the sealing member coupling portion 413, and an extension end portion 462 protruding from the sealing member body 461 and configured to support the upper end frame 254 of the filter part 250.

[0108] The sealing member body 461 may have a cross-section formed in an approximate 'C' shape so that the sealing member body 461 may be fitted into the sealing member coupling portion 413. However, the present disclosure is not limited thereto. Further, an inner diameter of the sealing member body 461 may be smaller than an outer diameter of the sealing member coupling portion 413. Further, the sealing member body 461 may be inserted into the sealing member coupling portion 413 and fixed in the upward/downward direction.

[0109] The extension end portion 462 may protrude downward from a lower end of the sealing member body 461 and then protrude radially inward, such that the extension end portion 462 may elastically support the upper end frame 254.

[0110] That is, when the exhaust cover 400 closes the upper side of the cleaner main body 200, an end of the extension end portion 462 may be supported by the upper end frame 254 and elastically deformed while becoming close to the module seating portion 412, and the extension end portion 462 may elastically support the upper end frame 254 downward.

[0111] In addition, the connector insertion hole 412a may be formed in the sealing member coupling portion 413, and the sealing member 460 may be inserted and fixed into the sealing member coupling portion 413 and cover the connector insertion hole 412a and the connector terminal 442 so that the connector insertion hole 412a and the connector terminal 442 are not exposed to the outside. In this case, the sealing member 460 may have a connector cover portion (not illustrated) formed to have a shape that covers a part of the connector terminal 442 disposed outward through the connector insertion hole 412a.

[0112] Therefore, the sealing member 460 is fixed to

the cover main body 410, such that the connector terminal 442 may be protected while being prevented from being brought into contact with an external device. When the sealing member 460 is separated from the cover main body 410, the connector terminal 442 may be exposed to the outside, such that the user may easily access the connector terminal 442.

[0113] In addition, the cover main body 410 may have the exhaust hole 411 through which the air having passed through the suction motor is discharged to the outside. For example, the exhaust hole 411 may be formed through the cover main body 410 in the upward/downward direction. At least one exhaust hole 411 may be formed in the cover main body 410. For example, the exhaust hole 411 may be provided as a plurality of exhaust holes 411 formed in the cover main body 410 and arranged in a circumferential direction. That is, the plurality of exhaust holes 411 may be arranged in a ring shape in the cover main body 410.

[0114] The exhaust hole 411 may be disposed radially outside the cover main body 410. In addition, the exhaust hole 411 may be formed in the cover main body 410 and disposed radially outside the display module 430. That is, the module seating portion 412 may be provided at a center of the upper portion of the cover main body 410, and the exhaust holes 411 may be arranged in the circumferential direction around the module seating portion 412. In particular, the exhaust hole 411 may be formed at a position corresponding, in the upward/downward direction, to a space between an inner circumferential surface of the cleaner main body 200 and the filter part 250. Therefore, the air having passed through the first filter 251 may move upward and be discharged to the outside through the exhaust hole 411, and an air flow path may be shortened.

[0115] In addition, the exhaust cover 400 has the hinge part 420 and is rotatably installed on the handle part 300. In this case, the exhaust cover 400 may rotate about the hinge shaft of the hinge part 420 and be positioned outside the cleaner main body 200 so as not to obstruct the inner flow region of the cleaner main body 200 when the cleaner main body 200 is opened or closed. Further, for example, the hinge shaft of the hinge part 420 of the exhaust cover 400 may be positioned on the handle part 300.

[0116] In addition, in the state in which the cleaner main body 200 is opened, the exhaust cover 400 may be rotated so as not to collide with the filter part 250 during the process of replacing the filter part 250 disposed in the cleaner main body 200 while moving the filter part 250 in the upward/downward direction. To this end, the exhaust cover 400 may be rotated at a preset angle in a state in which the hinge shaft of the hinge part 420 is positioned on the handle part 300. Therefore, as illustrated in FIGS. 4 and 5, the first filter 251 and the second filter 252 may be separated from the cleaner main body 200 while the first filter 251 and the second filter 252 are prevented from colliding with the exhaust cover 400 when the first filter

251 and the second filter 252 are separated from the cleaner main body 200.

[0117] The hinge part 420 may protrude from a lower end of one side of the cover main body 410 and then further protrude toward the handle part 300 so that the filter part 250 may be replaced in an open state in which the exhaust cover 400 opens the upper side of the cleaner main body 200.

[0118] In addition, when the exhaust cover 400 rotates at a preset angle while opening the cleaner main body 200, the exhaust cover 400 may be fixed to the handle part 300 by means of a catching means, thereby providing the user with convenience.

[0119] For example, the catching means may include a catching protrusion protruding from any one of the hinge part and the handle part toward the other of the hinge part and the handle part, and a catching groove provided on the other of the hinge part and the handle part so that the catching protrusion is inserted into the catching groove when the exhaust cover is rotated at the preset angle.

[0120] In another example, as illustrated in FIGS. 10 and 11, the catching means may include catching protrusions 422c protruding from the hinge part 420 and configured to fix the open state of the exhaust cover 400 while being supported by the cleaner main body 200 when the exhaust cover 400 is rotated at the preset angle.

[0121] The catching protrusions 422c are positioned inside the cleaner main body 200. When the exhaust cover 400 is rotated at the preset angle, the catching protrusions 422c may be positioned outside the cleaner main body 200, disposed outside the cleaner main body 200, and supported by the cleaner main body 200. That is, when the exhaust cover 400 is rotated, the catching protrusions 422c may pass through the hinge part insertion portion 210 while deforming the hinge part insertion portion 210 by an external force. Next, when the exhaust cover 400 is rotated at the preset angle, the catching protrusions 422c may support the cleaner main body 200. That is, the hinge part insertion portion 210 may support two opposite surfaces of the hinge part 420 so that the catching protrusions 422c cannot pass through the hinge part insertion portion 210 while deforming the hinge part insertion portion 210 unless an external force is applied. Therefore, the open state in which the exhaust cover 400 is rotated at the preset angle may be fixed.

[0122] Specifically, as illustrated in FIG. 9, the catching protrusions 422c of the hinge part 420 may be supported by ends of the protrusion support portion 223 when the exhaust cover 400 is in the open state. The protrusion support portions 223 are spaced apart from each other to the extent that the hinge part 420 is inserted between the protrusion support portions 223, and the protrusion support portions 223 define a spacing into which the hinge part 420 is inserted. The protrusion support portions 223 may support two opposite surfaces of the hinge part 420. Further, the catching protrusions 422c are positioned inside the cleaner main body 200 when the exhaust cover 400 is in the closed state. When the exhaust cover 400

rotates to the open state, the catching protrusions 422c may pass over the protrusion support portions 223 and be positioned outside the cleaner main body 200.

[0123] In this case, the protrusion support portions 223 may be elastically deformed when the catching protrusions 422c pass over the protrusion support portions 223. After the catching protrusions 422c pass over the protrusion support portions 223, the protrusion support portions 223 may be restored and support the two opposite surfaces of the hinge part 420.

[0124] In addition, when the catching protrusions 422c pass over the protrusion support portions 223 and are positioned outside the cleaner main body 200, the hinge part 420 may be supported on the hinge cover insertion portion 311 of the handle part 300, and the rotated state of the exhaust cover 400 may be fixed. That is, the catching protrusions 422c may be fixed and supported by the protrusion support portions 223 at one side of the exhaust cover 400 based on a rotation direction, and the hinge part 420 may be fixed and supported by the hinge cover insertion portion 311 at the other side of the exhaust cover 400 based on the rotation direction.

[0125] As described above, in the open state, the exhaust cover 400 may be fixed to the handle part 300 by means of the catching means. In the open state of the exhaust cover 400, the open state of the exhaust cover 400 may be maintained even though the cleaner main body 200 is inclined or moved. Therefore, the user easily replace the filter part 250.

[0126] Further, as illustrated in FIG. 8, when the exhaust cover 400 is rotated back to the closed state, the catching means may be unlocked by applying an external force to the exhaust cover 400 in the direction in which the exhaust cover 400 is closed. Specifically, when the external force is applied to the exhaust cover 400, the exhaust cover 400 rotates about the hinge shaft, and the catching protrusions 422c may be positioned in the cleaner main body 200 while elastically deforming the protrusion support portion 223.

[0127] In addition, the catching protrusions 422c may provide a sense of catching to the user while passing over the protrusion support portions 223 when the exhaust cover 400 rotates. The sense of catching enables the user to recognize that the exhaust cover 400 is fixed in the rotated state. On the contrary, even when the catching means is released, the catching protrusions 422c may provide the sense of catching to the user while passing over the protrusion support portion 223.

[0128] In addition, the catching protrusion 422c may be formed on at least one of two opposite surfaces of the hinge shaft of the hinge part 420.

[0129] The display module 430 may be configured to provide the user with various pieces of information and installed on the upper portion of the exhaust cover 400 to provide a relatively large display screen. The display module 430 may include the display panel 431, a fixing plate 432, and a protection panel 433.

[0130] The display panel 431 may be a liquid crystal

panel, e.g., an LCD panel or an LED panel. The display panel 431 is installed on the exhaust cover 400 so as to be exposed to the outside of the exhaust cover 400. The display panel 431 may be seated in and fixed to a panel seating groove 432a of the fixing plate 432.

[0131] The panel seating groove 432a, which is stepped in a shape corresponding to the display panel 431, may be provided in an upper portion of the fixing plate 432, such that the display panel 431 may be seated in and fixed to the panel seating groove 432a. The panel control board 440 may be fastened to a lower portion of the fixing plate 432 and electrically connected to the display panel 431.

[0132] Further, the panel seating groove 432a may have a through-hole 432b so that an element of the panel control board 440 is connected to the display panel 431. The through-hole 432b may be provided so that the element of the panel control board 440 fastened to the lower portion of the fixing plate 432 is connected to the display panel 431 mounted on the upper portion of the fixing plate 432.

[0133] The panel control board 440 may be configured to control the display panel 431 and connected to the main board 340 through the electric wire 441 to receive a control signal and power from the main board 340. The electric wire 441 may pass through the hinge part 420 and electrically connect the panel control board 440 and the main board 340. The electric wire 441 will be described below in detail.

[0134] In addition, the panel control board 440 may have the connector terminal 442 for software update or the like. The connector terminal 442 may be inserted into the connector insertion hole 412a of the module seating portion 412 and exposed to the outside, such that the user easily accesses the connector terminal 442. Further, when the user does not need to access the connector terminal 442, the connector terminal 442 may be protected by the sealing member 460 inserted into the sealing member coupling portion 413. Therefore, the user may access the connector terminal 442 by detaching only the sealing member 460 from the display module 430, as necessary. After a process, such as an update, is completed, the sealing member 460 may be fixed to the exhaust cover 400 to protect the connector terminal 442.

[0135] The protection panel 433 may be configured to protect the display panel 431 and made of a transparent material. The protection panel 433 may be seated on and fixed to the module seating portion 412 of the cover main body 410 and define an external appearance of the exhaust cover 400. In addition, the protection panel 433 may be mounted on the upper portion of the fixing plate 432 while covering the display panel 431.

[0136] In addition, the display panel 431 may be modularized so as to be easily installed and replaced, and the display panel 431 may be installed on the exhaust cover 400. For example, the fixing plate 432 and the protection panel 433 may constitute the display module 430 and be installed on the exhaust cover 400. That is, the protection

panel 433, the display panel 431, and the fixing plate 432 may be unitized and installed on the cover main body 410. The protection panel 433, the display panel 431, and the fixing plate 432 may be replaced or separated at once in the event of a failure. Therefore, the LCD module or the LED module is also easily replaced.

[0137] Meanwhile, the electric wire 441 may be disposed while passing through the hinge part 420, and the state in which the electric wire 441 is connected to the panel control board 440 and the main board 340 may be maintained when the exhaust cover 400 rotates.

[0138] To this end, the hinge part 420 may define a space through which the electric wire 441 passes, and the hinge part 420 may include a hinge frame 421, a hinge cover 422, and a support member 423. Hereinafter, the space of the hinge part 420, through which the electric wire 441 passes, may be referred to as an electric wire passing hole 420a.

[0139] The hinge frame 421 may protrude from one side to which the handle part 300 of the exhaust cover 400 is coupled, and a protruding end may be inserted into the handle part 300. For example, the hinge frame 421 may include an extension portion 421a and a hinge coupling portion 421b.

[0140] The extension portion 421a may protrude downward from the exhaust cover 400 and be disposed to face an outer side of the filter part 250.

[0141] The hinge coupling portion 421b may protrude toward the handle part 300 from the protruding end of the extension portion 421a. The hinge coupling portion 421b may support an inner surface of a portion that defines an external appearance of the upper portion of the handle part 300 in the state in which the exhaust cover 400 closes the cleaner main body 200.

[0142] The hinge coupling portion 421b may be rotatably coupled to the handle part 300. The hinge coupling portion 421b may have a hinge pin insertion hole 421c into which the hinge pin 424 is inserted. In addition, the protruding end of the hinge coupling portion 421b may be formed to define a curved surface.

[0143] The hinge cover 422 may be coupled to the hinge frame 421, and the electric wire passing hole 420a, through which the electric wire 441 passes, may be formed between the hinge cover 422 and the hinge frame 421. The hinge cover 422 may also include a first part disposed in the upward/downward direction and configured to cover the extension portion 421a, and a second part disposed in the forward/rearward direction perpendicular to the first part and configured to cover the hinge coupling portion 421b.

[0144] The electric wire passing hole 420a may be formed between the hinge cover 422 and the hinge frame 421 and formed between the extension portion 421a and the first part and between the hinge coupling portion 421b and the second part.

[0145] Therefore, the electric wire 441 may be disposed to pass through the hinge frame 421 and the hinge cover 422 and pass through the protruding end of the

hinge coupling portion 421b and an end of the second part. That is, the electric wire 441 may pass through the electric wire passing hole 420a and the guide hole 312a and be connected to the main board 340 disposed in the handle part 300.

[0146] The hinge cover 422 may have the catching protrusion 422c formed on at least one of two opposite surfaces based on the direction of the hinge shaft. The hinge cover 422 may have a hinge pin through-hole 422a formed to be consistent with the hinge pin insertion hole 421c so that the hinge pin 424 is inserted into the hinge pin through-hole 422a. The catching protrusion 422c may be positioned to be spaced apart from the hinge pin through-hole 422a. In the state in which the exhaust cover 400 closes the cleaner main body 200, the catching protrusion 422c may be positioned in the cleaner main body 200, and the hinge pin 424 may be positioned outside the cleaner main body 200, i.e., positioned in the handle part 300.

[0147] In addition, the hinge cover 422 may be inserted into the hinge cover insertion portion 311 and define a part of an external appearance between the cleaner main body 200 and the handle part 300. A support rib 422b configured to support an inner surface of the handle part 300 may be provided at an end of the second part adjacent to the handle part 300. The support rib 422b may be formed as an end of the hinge cover 422 protrudes rearward. When the exhaust cover 400 is in the closed state, the support rib 422b may support the inner surface of the handle part 300. Alternatively, when the exhaust cover 400 is in the closed state, the support rib 422b may support an inner surface of an edge end of the hinge cover insertion portion 311 of the handle part 300.

[0148] The support member 423 may be inserted between the hinge frame 421 and the hinge cover 422, support the electric wire 441, fix the electric wire 441 between the support member 423 and the hinge frame 421, and prevent a motion of the electric wire 441. The support member 423 may fix the electric wire 441 and prevent the electric wire 441 from being twisted.

[0149] The support member 423 may include a guide block 423b and an external appearance forming portion 423a. The guide block 423b may be disposed in the upward/downward direction and inserted between the extension portion 421a of the hinge frame 421 and the hinge cover 422. The external appearance forming portion 423a is provided at an upper end of the guide block 423b, and an upper portion of the external appearance forming portion 423a is formed to define a shape of the exhaust hole 411. The external appearance forming portion 423a is inserted into the cover main body 410 so that the exhaust hole 411 of the cover main body 410 is disposed in a ring shape in view of an external appearance.

[0150] That is, the hinge part 420 may be disposed on the cover main body 410, and the exhaust hole 411 may be disposed in a ring shape cut along a circumference of the module seating portion 412. The support member

423 may be inserted between the cut portions, and the external appearance forming portion 423a may define a part of an external appearance of the exhaust hole 411. Therefore, the exhaust hole 411 may define a ring shape together with the external appearance forming portion 423a.

[0151] The hinge pin 424 may be inserted and disposed into the hinge pin insertion hole 421c and the hinge pin through-hole 422a and fixed to the handle part 300.

[0152] Meanwhile, the locking ring 450 may define an external appearance of an outer circumferential side of the exhaust cover 400 and be formed in a hollow cylindrical shape that surrounds an outer circumferential side of the cover main body 410. At least one support projection 452 may protrude from an inner circumferential surface of the locking ring 450. The support projection 452 may be provided as a plurality of support projections 452 spaced apart from one another at equal intervals in the circumferential direction. The display module 430 may be seated on the support projection 452.

[0153] The locking ring 450 may be fixedly installed on the cover main body 410 while defining an external appearance of the display module 430 and rotatably installed on the cover main body 410. The locking ring 450 may rotate relative to the cover main body 410 to lock the exhaust cover 400 to the cleaner main body 200 or unlock the exhaust cover 400 from the cleaner main body 200.

[0154] For example, the cleaner main body 200 may include a locking portion 221 protruding from an outer circumferential surface of the locking ring support portion 220 and configured to define a predetermined gap together with an upper end of the cleaner main body 200. Further, when the locking ring 450 rotates, a locking protrusion 451 formed on the locking ring 450 is inserted into a predetermined gap between the upper end of the cleaner main body 200 and the locking portion 221, and the locking protrusion 451 is supported by the locking portion 221, such that the exhaust cover 400 is locked to the cleaner main body 200 in the closed state.

[0155] The locking protrusion 451 may protrude from an inner circumferential surface of the locking ring 450 and be disposed at a lower end of the locking ring 450. Further, the locking portion 221 and the locking protrusion 451 may be configured as a pair. In case that a plurality of pairs are provided, the locking portions 221 and the locking protrusions 451 may be disposed to be spaced apart from one another at equal intervals in the circumferential direction.

[0156] In addition, a rotation restricting portion 222 may protrude from one end of the locking portion 221 based on the circumferential direction toward an upper end of the cleaner main body 200. After the locking protrusion 451 is inserted into the predetermined gap between the upper end of the cleaner main body 200 and the locking portion 221, the locking ring 450 may rotate until the locking ring 450 is supported by the rotation restricting portion 222. Further, when the locking protrusion

451 is supported on the rotation restricting portion 222 while the locking ring 450 rotates in one direction, the locking ring 450 cannot rotate any further. In this case, the user may recognize that the exhaust cover 400 is locked.

[0157] That is, when the exhaust cover 400 rotates to close the open upper side of the cleaner main body 200, the locking protrusions 451 are inserted between the locking portions 221, rotated in one direction, and inserted into the predetermined gap between the upper end of the cleaner main body 200 and the locking portion 221, such that the closed state of the exhaust cover 400 is locked.

[0158] On the contrary, when the exhaust cover 400 rotates in the other direction, the locking protrusion 451 is not supported by the locking portion 221, the exhaust cover 400 is unlocked from the cleaner main body 200, and a state is made in which the exhaust cover 400 may be rotated.

[0159] While the specific embodiments of the present disclosure have been described and illustrated, it is obvious to those skilled in the art that the present disclosure is not limited to the aforementioned embodiments and may be variously changed and modified without departing from the spirit and the scope of the present disclosure. Therefore, the scope of the present disclosure should be determined by the technical spirit of the appended claims instead of being determined by the described embodiment.

[Description of Reference Numerals]

[0160]

100:	Dust bin
200:	Cleaner main body
210:	Hinge part insertion portion
220:	Locking ring support portion
230:	Suction motor
240:	Air guide
250:	Filter part
251:	First filter
252:	Second filter
300:	Handle part
310:	Handle body
311:	Hinge cover insertion portion
312:	Electric wire guide portion
340:	Main board
400:	Exhaust cover
410:	Cover main body
411:	Exhaust hole
420:	Hinge part
421:	Hinge frame
422:	Hinge cover
423:	Support member
424:	Hinge pin
430:	Display module
431:	Display panel
432:	Fixing plate

433: Protection panel
 440: Panel control board
 441: Electric wire
 442: Connector terminal
 450: Locking ring
 460: Sealing member

Claims

1. A cleaner comprising:

a dust bin (100) configured to store sucked dust;
 a suction motor (230) configured to generate a suction force toward the inside of the dust bin (100);
 a cleaner main body (200) coupled to the dust bin (100), configured to accommodate the suction motor (230) therein, and having an outer portion to which a handle part (300) is coupled;
 an exhaust cover (400) installed to open or close the cleaner main body (200); and
 a display module (430) installed on the exhaust cover (400) and having a display panel (431) exposed to the outside of the exhaust cover (400),
characterized in that wherein the exhaust cover (400) has a hinge part (420) and is rotatably installed on the handle part (300).

2. The cleaner of claim 1, wherein the handle part (300) comprises a main board (340) disposed therein, and wherein the display module (430) comprises an electric wire (441) configured to pass through the hinge part (420) and electrically connect the display module (430) to the main board (340).

3. The cleaner of claim 2, wherein the hinge part (420) comprises:

a hinge frame (421) protruding from the exhaust cover (400) and inserted into the handle part (300); and
 a hinge cover (422) coupled to the hinge frame (421) and configured to define a space through which the electric wire (441) passes between the hinge cover (422) and the hinge frame (421).

4. The cleaner of claim 3, wherein the hinge frame (421) comprises:

an extension portion (421a) protruding downward from the exhaust cover (400) and disposed to face an outer side of a filter part (250); and
 a hinge coupling portion (421b) protruding from a protruding end of the extension portion (421a) toward the handle part (300) and rotatably coupled to the handle part (300).

5. The cleaner of claim 1, wherein a hinge shaft of the hinge part (420) is positioned on the handle part (300).

6. The cleaner of claim 5, wherein the exhaust cover (400) is fixed to the handle part (300) by means of a catching means when the exhaust cover (400) rotates at a preset angle while opening the cleaner main body (200).

7. The cleaner of claim 6, wherein the catching means comprises a catching protrusion (422c) protruding from the hinge part (420) and configured to be supported by the cleaner main body (200) to fix an open state of the exhaust cover (400) when the exhaust cover (400) rotates at the preset angle,

wherein the cleaner main body (200) has a hinge part insertion portion (210) into which the hinge part (420) is inserted,
 wherein the catching protrusion (422c) is positioned in the cleaner main body (200), and
 wherein the catching protrusion (422c) passes over the hinge part insertion portion (210) while deforming the hinge part insertion portion (210) and is positioned outside the cleaner main body (200) to fix the open state of the exhaust cover (400) when the exhaust cover (400) rotates.

8. The cleaner of claim 1, further comprising:

a filter part (250) configured to filter air discharged through the exhaust cover (400),
 wherein the exhaust cover (400) supports the filter part (250) when the exhaust cover (400) closes the cleaner main body (200).

9. The cleaner of claim 1, wherein the exhaust cover (400) comprises a cover main body (410) having at least one exhaust hole (411) through which air is discharged to the outside,

wherein the display module (430) is installed on an upper portion of the cover main body (410), and
 wherein the exhaust hole (411) is formed radially outside the display module (430).

10. The cleaner of claim 9, wherein the exhaust cover (400) further comprises a locking ring (450) rotatably installed on the cover main body (410) and configured to be locked to or unlocked from the cleaner main body (200) while rotating.

11. The cleaner of claim 9, wherein the display module (430) comprises:

a fixing plate (432) having an upper portion to

which the display panel (431) is fixed;
a protection panel (433) mounted on the upper
portion of the fixing plate (432) and configured to
define an external appearance of the exhaust
cover (400); and
a panel control board (440) fastened to a lower
portion of the fixing plate (432) and electrically
connected to the display panel (431).

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- 12.** The cleaner of claim 11, wherein the exhaust cover (400) further comprises a sealing member (460) having a hollow shape and installed on a sealing member coupling portion (413) formed on a lower portion of the cover main body (410), and wherein the sealing member (460) seals a portion between the exhaust cover (400) and a filter part (250) installed in the cleaner main body (200). 10 15
- 13.** The cleaner of claim 12, wherein the cover main body (410) has a connector insertion hole (412a) formed in the sealing member coupling portion (413), and wherein the panel control board (440) has a connector terminal (442) inserted into the connector insertion hole (412a) and configured to be exposed to the outside when the sealing member (460) is detached. 20 25

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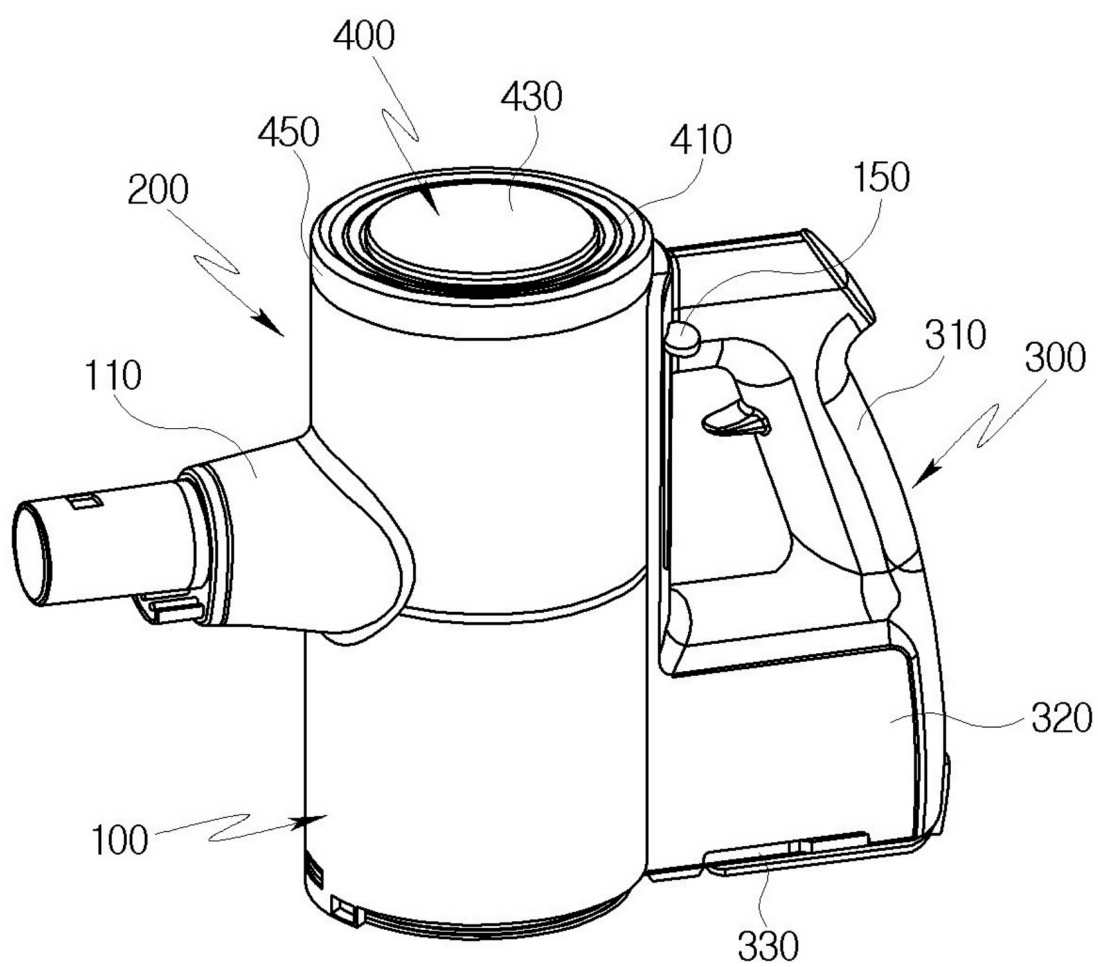
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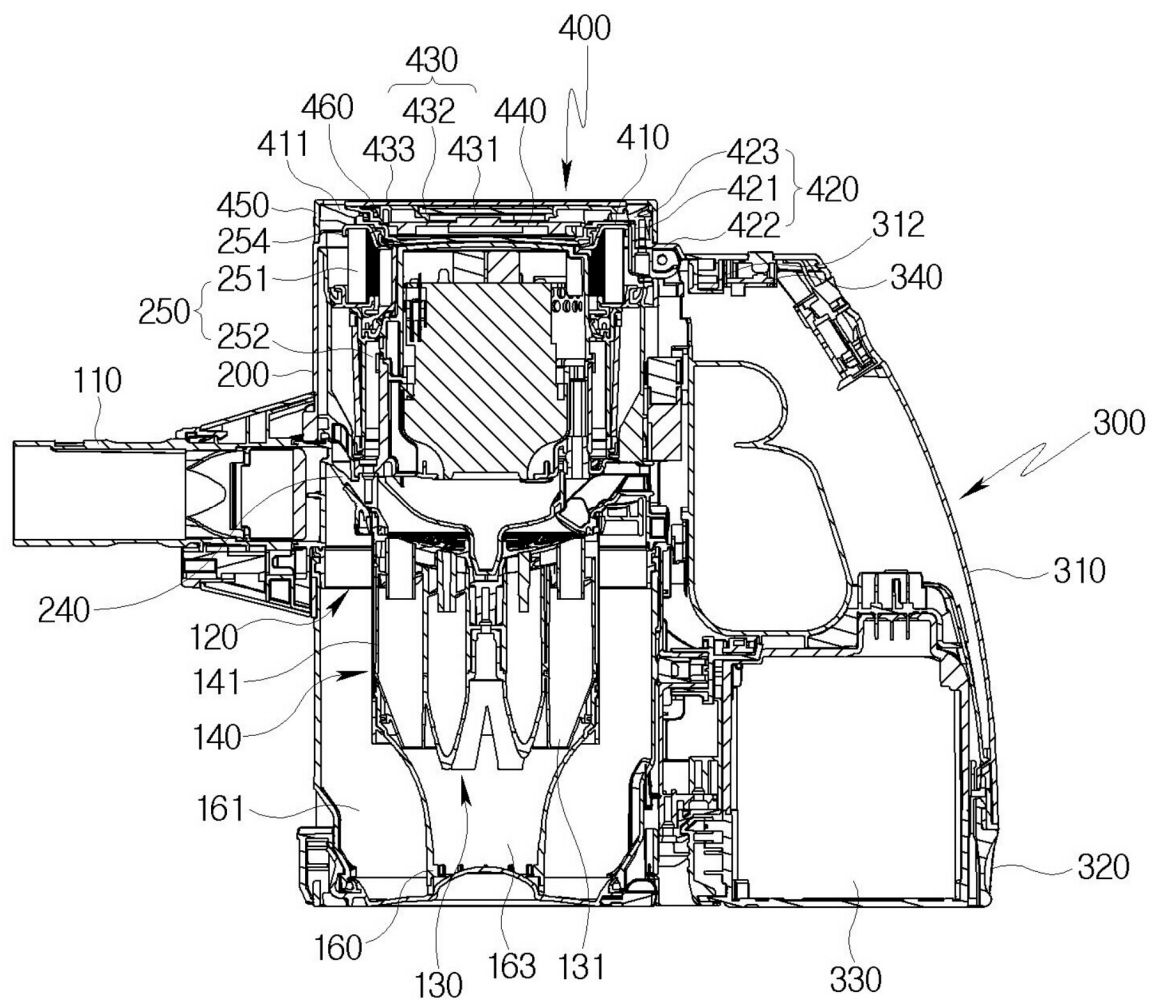
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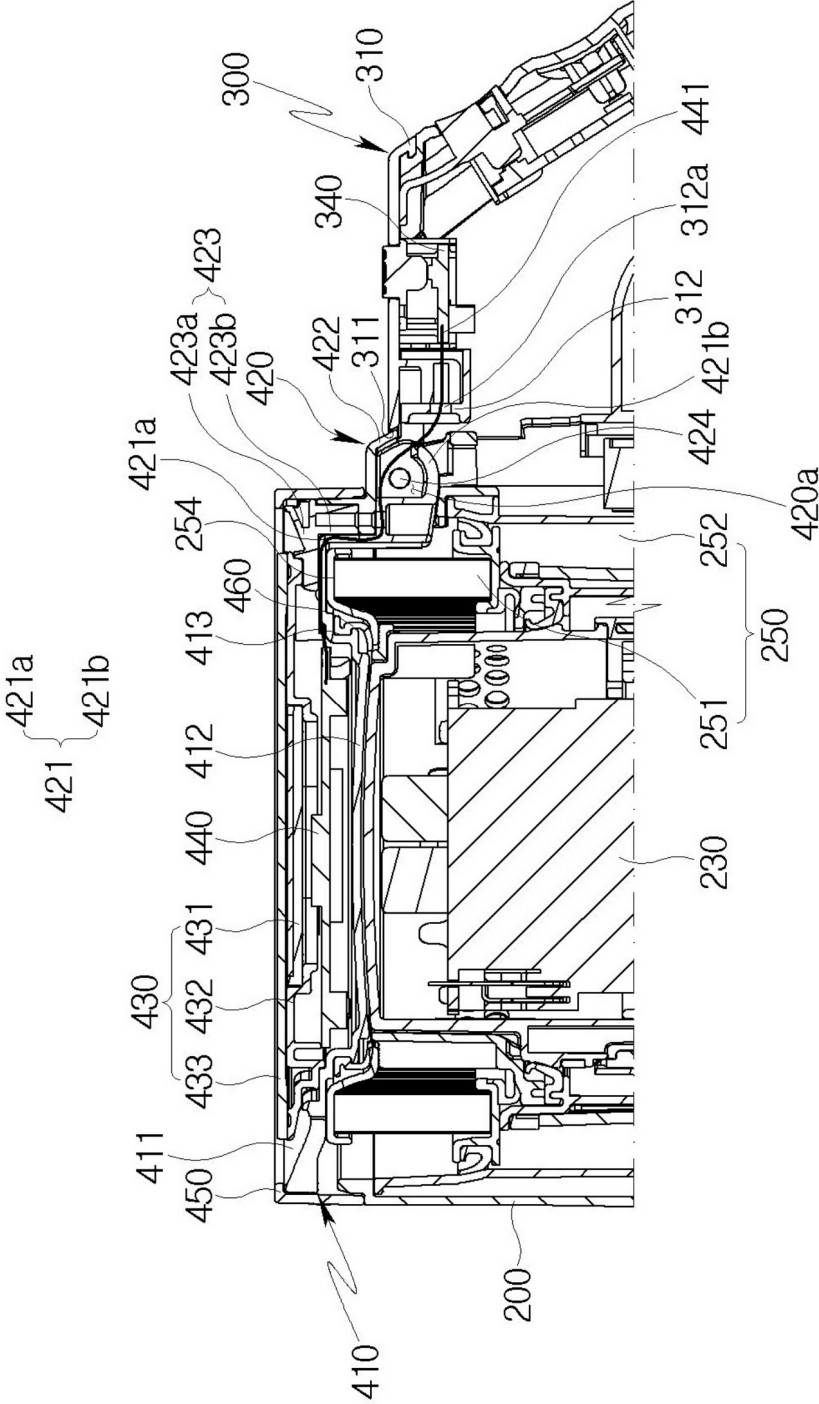
[FIG. 1]



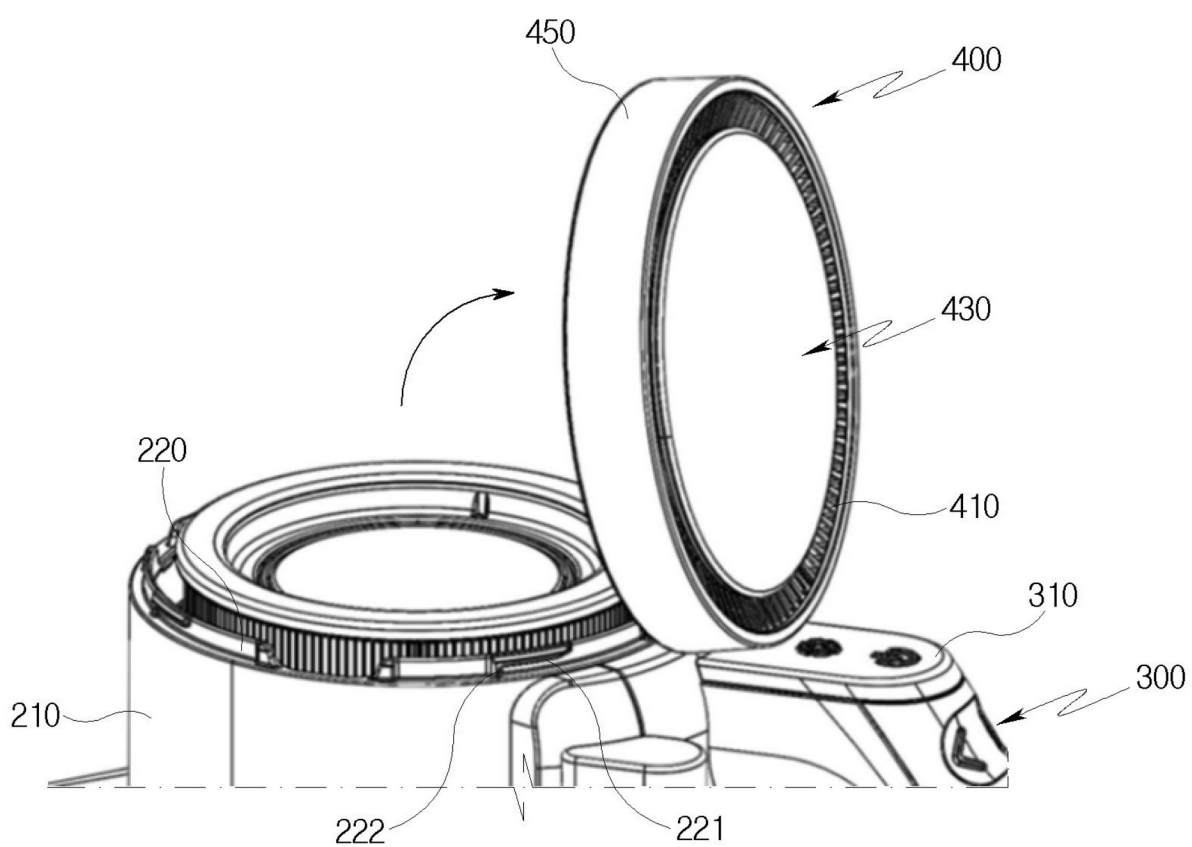
[FIG. 2]



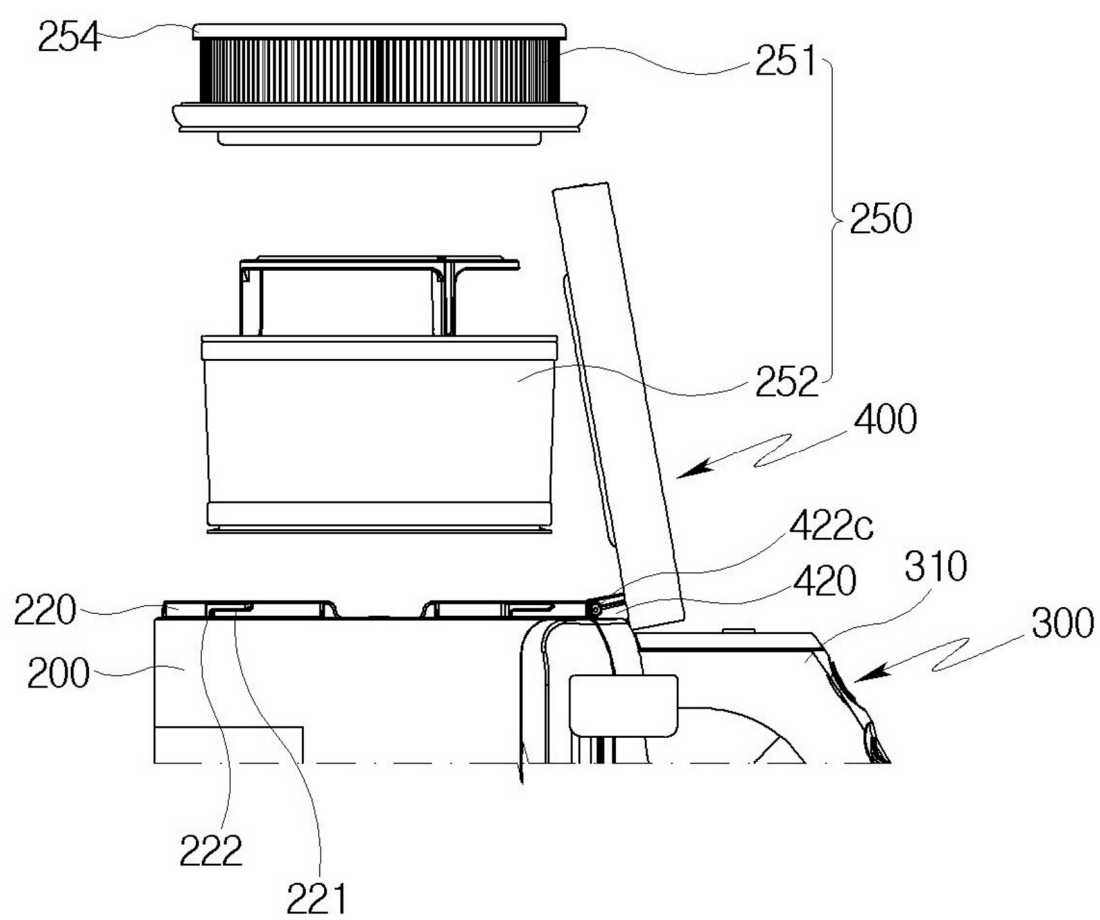
[FIG. 3]



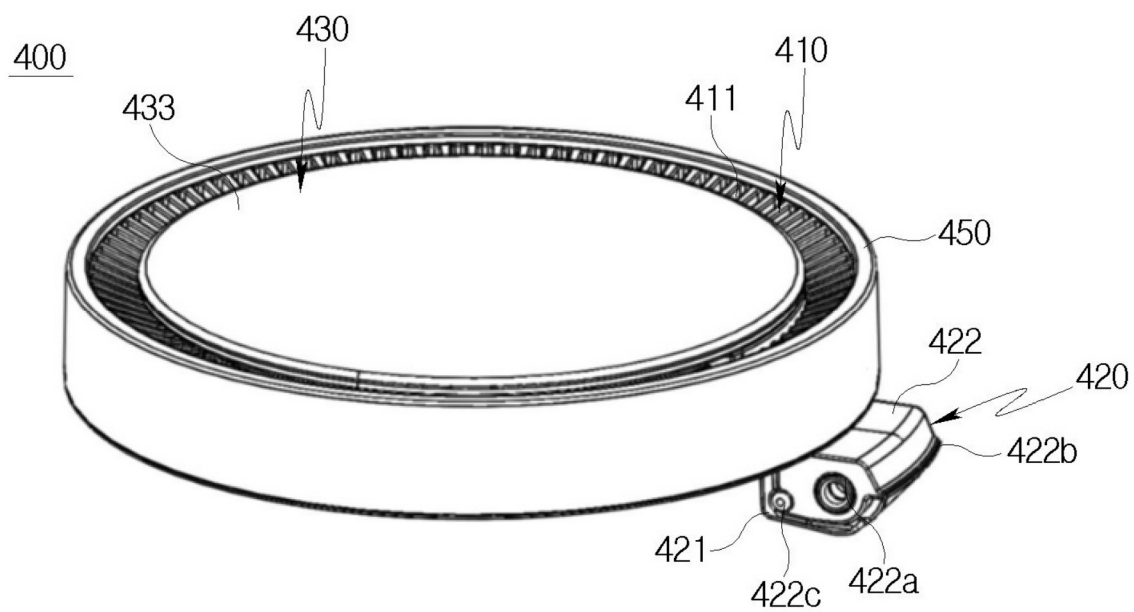
[FIG. 4]



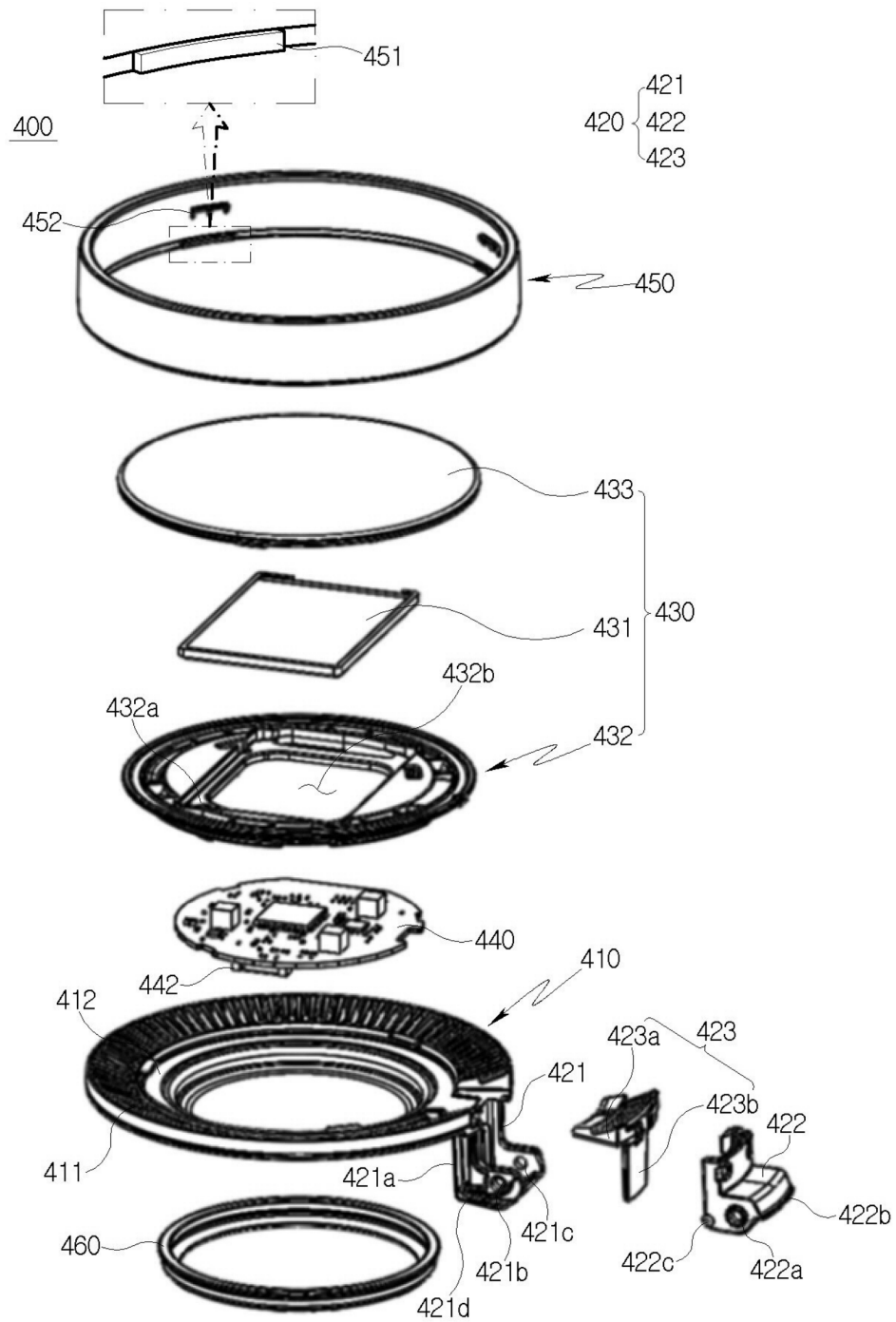
[FIG. 5]



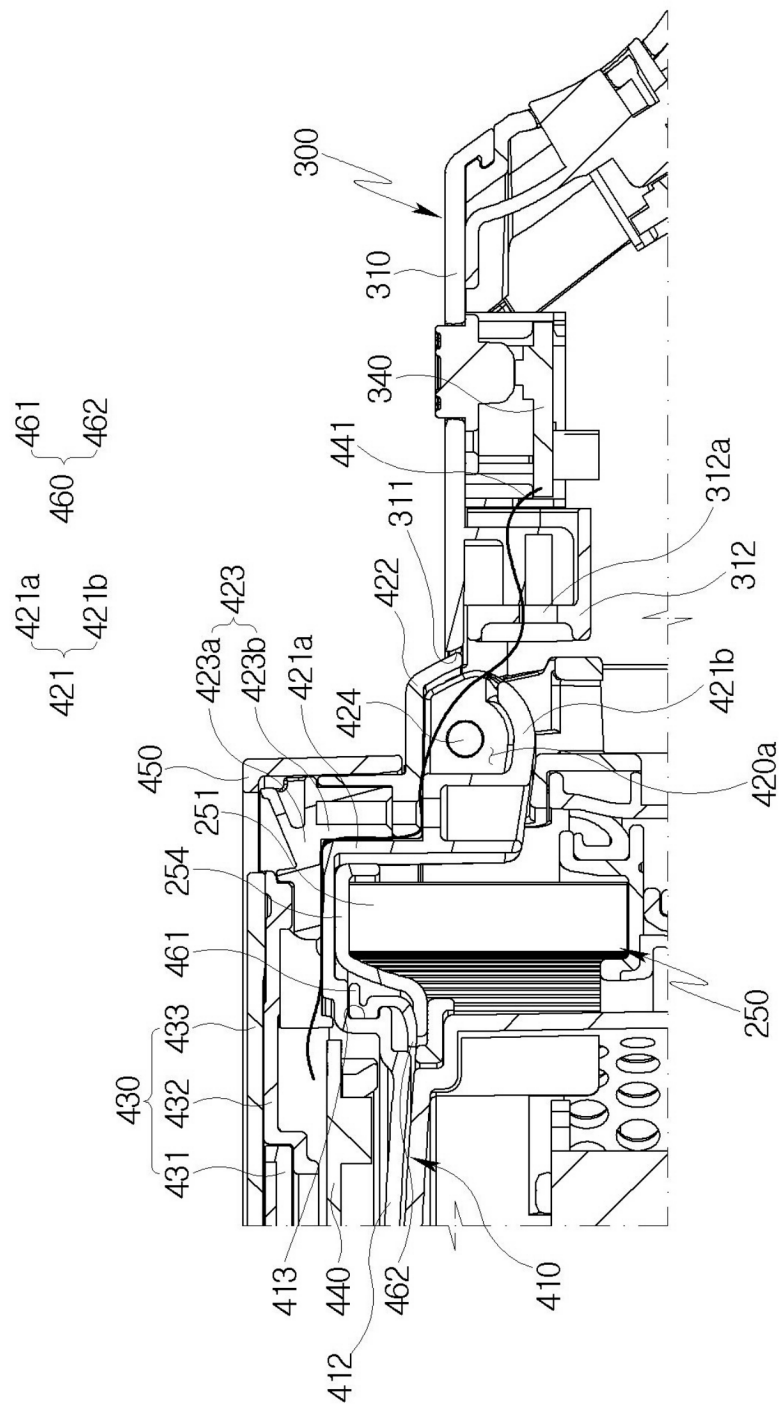
[FIG. 6]



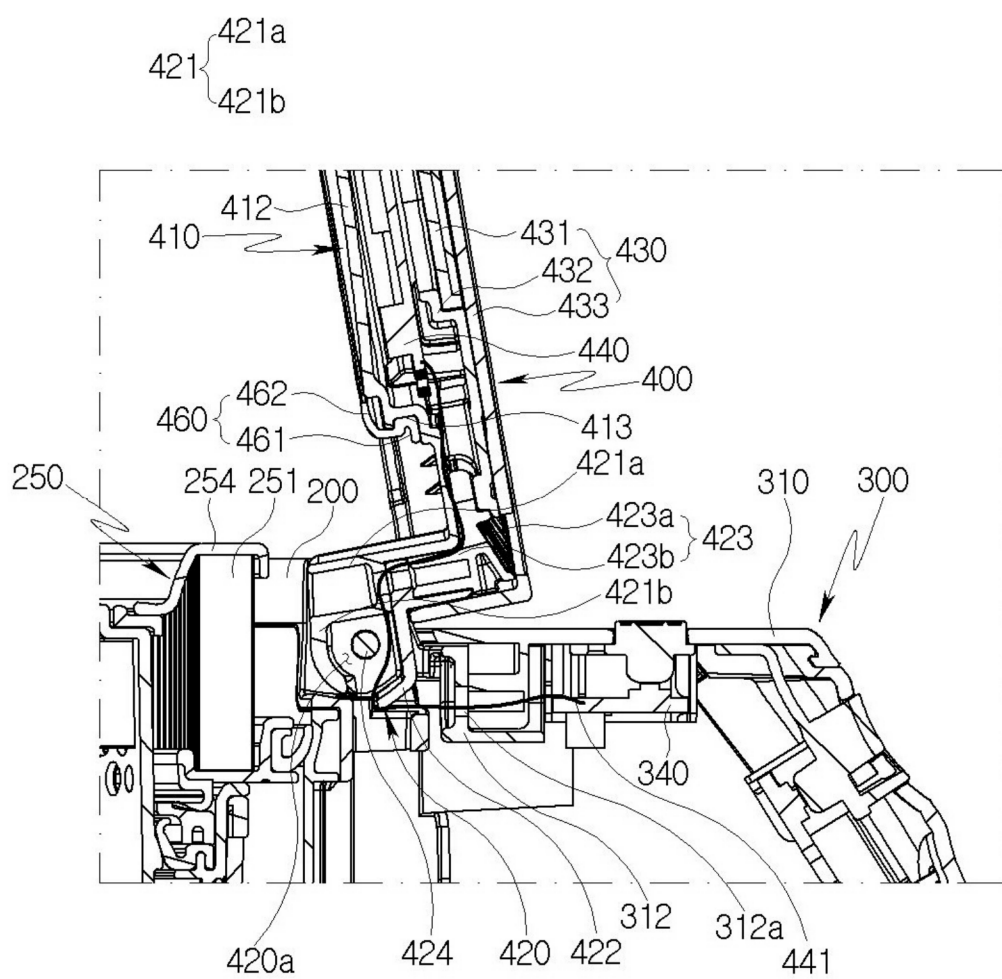
[FIG. 7]



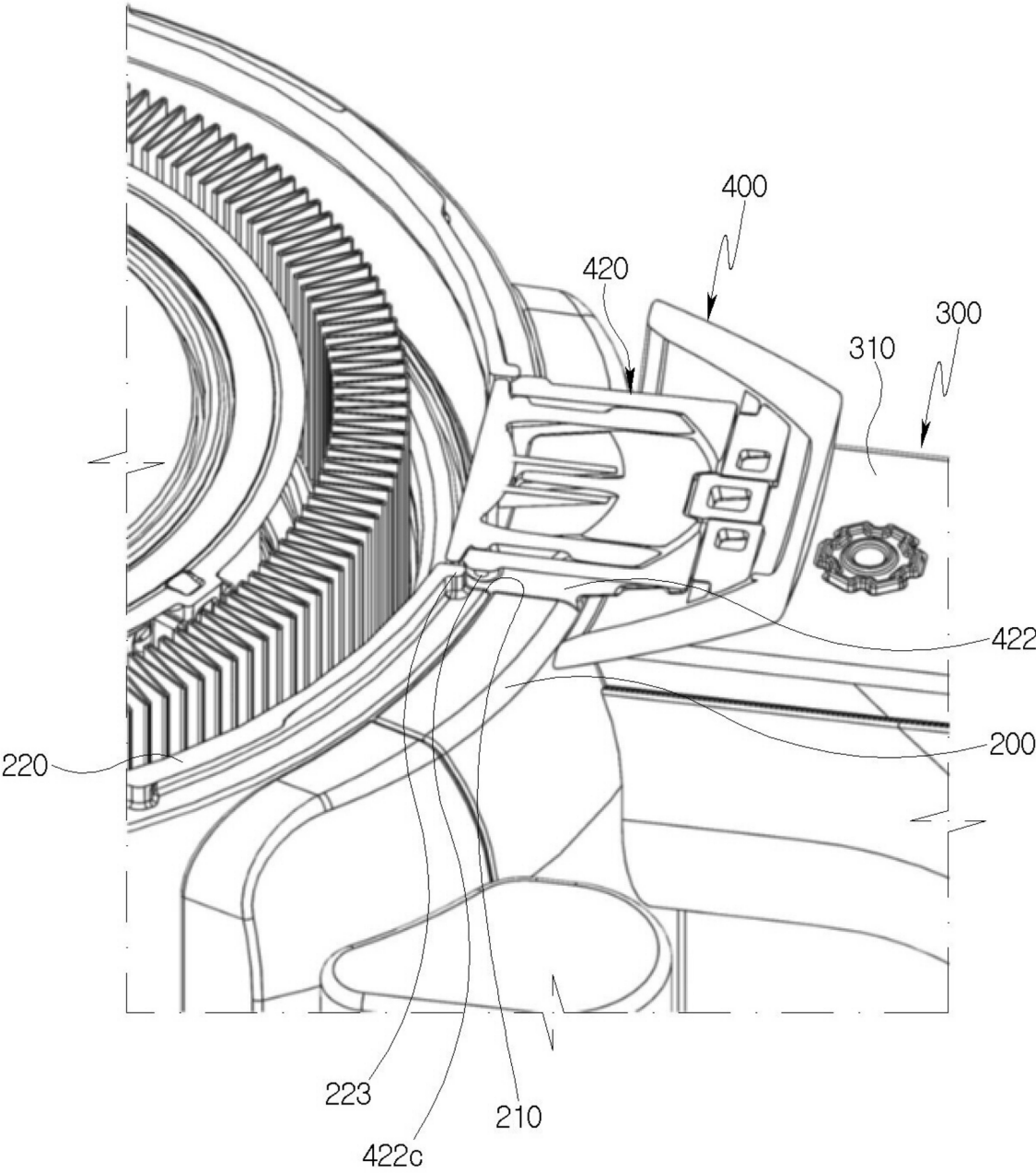
[FIG. 8]



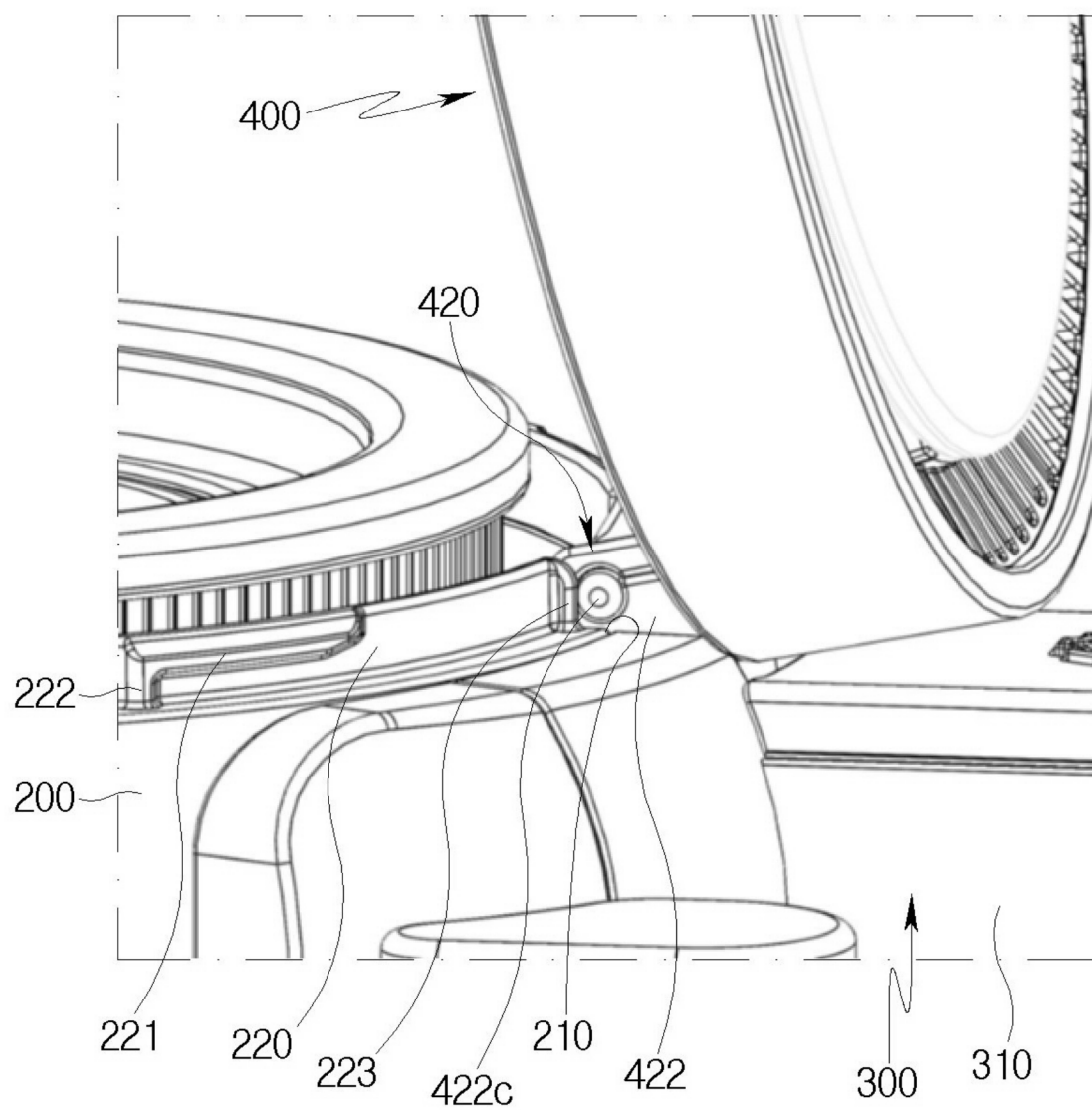
[FIG. 9]



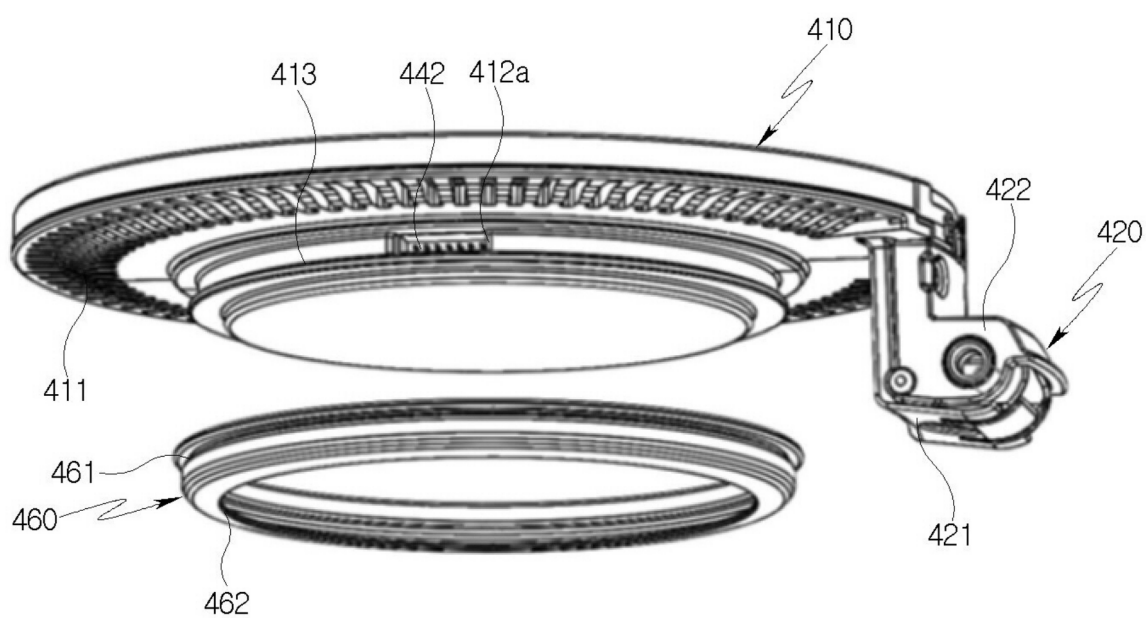
[FIG. 10]



[FIG. 11]



[FIG. 12]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2024/002250

A. CLASSIFICATION OF SUBJECT MATTER

A47L 9/28(2006.01)i; A47L 9/12(2006.01)i; A47L 5/24(2006.01)i; A47L 9/32(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 5/24(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(cleaner), 집진부(dust collector), 모터(motor), 핸들(handle), 배기 커버(exhaust cover), 디스플레이(display), 힌지(hinge)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2017-0131287 A (LG ELECTRONICS INC.) 29 November 2017 (2017-11-29) See paragraphs [0120]-[0138] and [0243]-[0315] and figures 1-3 and 15-25.	1-13
Y	JP 2022-145901 A (HITACHI GLOBAL LIFE SOLUTIONS INC.) 04 October 2022 (2022-10-04) See paragraphs [0016]-[0033] and [0052]-[0069] and figures 1-2 and 8-12.	1-13
Y	KR 10-2019-0000620 A (LG ELECTRONICS INC.) 03 January 2019 (2019-01-03) See paragraphs [0102]-[0109] and [0179] and figures 5-12.	8-13
A	KR 10-2022-0057139 A (LG ELECTRONICS INC.) 09 May 2022 (2022-05-09) See paragraph [0126] and figures 6-7.	1-13
A	KR 10-2022-0029054 A (SAMSUNG ELECTRONICS CO., LTD.) 08 March 2022 (2022-03-08) See paragraph [0082] and figures 4-7.	1-13

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

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“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

20 June 2024

Date of mailing of the international search report

21 June 2024

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2024/002250

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				KR	10-1978282	B1	13 May 2019
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				WO	2022-050549	A1	10 March 2022

REFERENCES CITED IN THE DESCRIPTION

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