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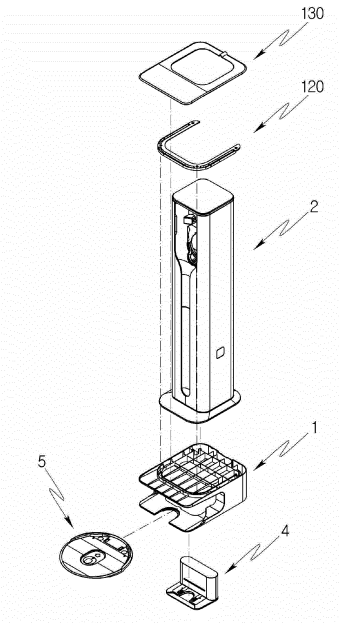
(54) **CLEANER SYSTEM AND CONNECTION ASSEMBLY FOR CLEANER SYSTEM**

(57) The present invention relates to a connection assembly for a cleaner system, the connection assembly comprising: a station coupling part which supports and is coupled to the lower side of a cleaner station that suctions and collects dust inside a dust container of a cleaner; and a charging stand coupling part which is disposed below the station coupling part and to which a robot cleaner coupling plate and a charging stand are coupled, wherein a robot cleaner is coupled to the robot cleaner coupling plate and the charging stand supplies power to the robot cleaner. The present disclosure has the effect of improving space efficiency.

[FIG. 2]



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Description

Technical Field

[0001] The present disclosure relates to a cleaner system and a connection assembly for a cleaner system, and more specifically, to a cleaner system and a connection assembly for a cleaner system that combines a cleaner station that collects dust inside the dust bin of a cleaner and a charging stand that charges a robot cleaner.

Background Art

[0002] In general, a cleaner may refer to an electrical appliance that draws in small garbage or dust by sucking air and fills a dust bin provided in the cleaner with the garbage or dust. Such a cleaner may be 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 and configuration of the cleaner, the manual cleaners may be classified into a canister cleaner, an upright cleaner, a handheld 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 handheld and stick cleaners, 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 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. 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] However, in the conventional hand vacuum cleaner and the conventional stick vacuum cleaner, since the dust bin that stores the collected dust has a small capacity, it is inconvenient for the user to empty the dust bin every time.

[0009] Also, dust scatters to adversely affect the user's health during the emptying of the dust bin.

[0010] Also, when the residual dust in the dust bin is not removed, the suction force of the vacuum cleaner is decreased.

[0011] Also, when the residual dust in the dust bin is not removed, odors occur due to the residue.

[0012] Recently, robot cleaners, which autonomously perform a cleaning operation without a user's manipulation, are becoming more common. The robot cleaner may automatically clean a zone to be cleaned by sucking in foreign substances, such as dust, from the floor while autonomously traveling in the zone to be cleaned.

[0013] Here, after performing cleaning, the robot cleaner may autonomously drive and be connected to a charging stand for the robot cleaner, and may be charged by receiving power from the charging stand.

[0014] Meanwhile, prior literature KR2020-0074054A discloses a vacuum cleaner and a docking station.

[0015] In the case of the docking station, when the dust bin of the cleaner is coupled to the docking station, dust stored in the dust bin of the cleaner may be collected into the interior of the docking station.

[0016] However, the docking station cannot charge the robot cleaner, and even if a separate charging stand for the robot cleaner is used, the docking station and charging stand for the robot cleaner are placed separately on a plane, so the plane space occupied by the docking station and charging stand for the robot cleaner increases.

Disclosure

Technical Problem

[0017] The present disclosure has been devised to improve the problems of the conventional cleaner system as described above, and has an object to provide a connection assembly for a cleaner system that can minimize the space occupied by the cleaner station and charging stand for the robot cleaner.

[0018] In addition, the present disclosure has an object to provide a connection assembly for a cleaner system that can stably support a cleaner station.

[0019] In addition, the present disclosure has an object to provide a connection assembly for a cleaner system that can facilitate communication between a charging stand and the robot cleaner.

[0020] In addition, the present disclosure has an object to provide a connection assembly for a cleaner system that can prevent tangles of wires by organizing the wires connected to the cleaner station and the wires connected to the charging stand for the robot cleaner.

[Technical Solution]

[0021] In order to achieve the above objects, a connection assembly for a cleaner system according to the present disclosure may comprise a station coupling part

that supports and is coupled to a lower side of a cleaner station that suctions and collects dust inside a dust container of a cleaner; and a charging stand coupling part that is disposed on a lower side of the station coupling part and to which a robot cleaner coupling plate and a charging stand are coupled, wherein a robot cleaner is coupled to the robot cleaner coupling plate and the charging stand supplies power to the robot cleaner.

[0022] Here, the station coupling part may include a station support plate that is disposed to face a lower surface of the cleaner station and in contact with the lower surface of the cleaner station.

[0023] The station coupling part may include a support plate cover that is coupled to an upper side of the station support plate and covers at least a portion of the lower surface of the cleaner station.

[0024] A station through hole through which the cleaner station passes is formed in the support plate cover, and a maximum diameter of the station through hole is smaller than a minimum diameter of the lower surface of the cleaner station.

[0025] A station receiving groove in which the lower surface of the cleaner station is accommodated may be formed in the station support plate, and in a state in which the support cover is coupled to the station support plate, at least a portion of the support plate cover may cover a vertical upper portion of the station receiving groove.

[0026] The station coupling part may include a support frame that is coupled between the station support plate and the support plate cover and supports the lower surface of the cleaner station.

[0027] The station support plate may include a station receiving groove in which the lower surface of the cleaner station is accommodated; and a frame receiving groove that is formed to surround an outside of the station receiving groove and receives the support frame.

[0028] The support frame may include a frame main body that is formed to cover an upper portion of the lower surface of the cleaner station; and a coupling rib that protrudes and extends downward from the frame main body and is coupled to the frame receiving groove.

[0029] The station coupling part may include a wire passage groove that is formed by protruding from the support plate cover in an arch shape and through which a wire passes.

[0030] Meanwhile, the robot cleaner coupling part may include a coupling frame that is disposed on a lower side of the station coupling part and disposed in parallel with the station coupling part at a predetermined interval; and a charging stand receiving hole that is formed in the coupling frame and accommodates the charging stand that supplies power to the robot cleaner.

[0031] An upper portion of the coupling frame may be covered by the robot cleaner coupling plate.

[0032] The connection assembly for a cleaner system according to the present disclosure may further comprise a pair of connection walls that connect the station coupling part and the charging stand coupling part.

[0033] The connection assembly for a cleaner system according to the present disclosure may further comprise a wire organizer that is disposed between the pair of connection walls, disposed below the station support plate, and capable of winding a wire.

[0034] The connection assembly for a cleaner system according to the present disclosure may further comprise a support wall that extends from the connection wall and supports the station coupling part.

[0035] The connection assembly for a cleaner system according to the present disclosure may further comprise a plurality of signal passage holes formed in the support wall to allow a signal to pass through

[0036] A cleaner system according to the present disclosure may comprise a cleaner that includes a suction part with a suction passage through which air is able to flow, a dust separating part having at least one cyclone part, and a dust bin that stores dust separated through the dust separating part; a cleaner station that includes a coupling part to which the dust bin is coupled, a dust collecting part that collects dust inside the dust bin, a dust collecting motor that generates a suction force to suck the dust inside the dust bin into the dust collecting part, and a housing that includes the dust collecting part and the dust collecting motor therein along a longitudinal direction; a robot cleaner that includes a battery and a motor inside and moves along a floor surface to clean the floor surface; a charging stand that supplies power to the robot cleaner; a robot cleaner coupling plate on which the robot cleaner is coupled at an upper portion thereof and through which a charging terminal of the charging stand passes; and a connection assembly that is coupled to a lower side of the cleaner station, accommodates the charging stand therein, and is coupled to the robot cleaner coupling plate.

[0037] Here, the charging stand may be disposed below the cleaner station, and the robot cleaner may be disposed below the cleaner.

[0038] Meanwhile, the charging stand may be electrically connected to the cleaner station and may receive current through the cleaner station.

Advantageous Effects

[0039] As described above, according to a cleaner system and a connection assembly for a cleaner system according to the present disclosure, the lower side of the cleaner station is supported and the charging stand for the robot cleaner is accommodated therein, thereby improving space efficiency.

[0040] In addition, the lower surface of the cleaner station is coupled to the upper surface of the connection assembly for the cleaner system, and the upper portion of the lower surface of the cleaner station is covered with a cover to stably support the cleaner station.

[0041] In addition, the cleaner and the cleaner station may be stably supported through the connection wall and support wall.

[0042] In addition, a signal passage hole is formed in the support wall, and thus, the transmission and reception of signals are facilitated between the charging stand and the robot cleaner.

[0043] In addition, the electric wires connected to the cleaner station and the electric wires connected to the charging stand for the robot cleaner may be wound and organized through the winding part.

[0044] In addition, by electrically connecting the charging stand to the cleaner station, current may be supplied to the charging stand and the cleaner station with a single power line.

Description of Drawings

[0045]

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

FIG. 2 is an exploded perspective view for explaining a connection assembly for a cleaner system according to an embodiment of the present disclosure.

FIG. 3 is a cross-sectional view for explaining a cleaner and cleaner station in a cleaner system according to an embodiment of the present disclosure.

FIG. 4 is a perspective view for explaining a charging stand in a cleaner system according to an embodiment of the present disclosure.

FIG. 5 is a perspective view for explaining a robot cleaner coupling plate in a cleaner system according to an embodiment of the present disclosure.

FIG. 6 is a perspective view of a state in which a charging stand and robot cleaner coupling plate are coupled to a connection assembly in a cleaner system according to an embodiment of the present disclosure.

FIG. 7 is a rear view of FIG. 6.

FIG. 8 is a side view of FIG. 6.

FIG. 9 is a perspective view of FIG. 6 viewed from another direction.

FIG. 10 is a perspective view for explaining a connection assembly in a vacuum cleaner system according to an embodiment of the present disclosure.

FIG. 11 is a perspective view of FIG. 10 viewed from another direction.

FIG. 12 is a perspective view for explaining a support frame in a connection assembly according to an embodiment of the present disclosure.

FIG. 13 is a perspective view for explaining a support plate cover in a connection assembly according to an embodiment of the present disclosure.

FIG. 14 is a perspective view of FIG. 13 viewed from a different angle.

FIG. 15 is a diagram for explaining a state in which a charging stand is coupled to a connection assembly for a cleaner system according to an embodiment of the present disclosure.

FIG. 16 is a diagram for explaining a state in which a robot cleaner coupling plate is coupled to a connection assembly for a cleaner system according to an embodiment of the present disclosure.

FIG. 17 is a diagram for explaining a state in which a cleaner station is coupled to a connection assembly for a vacuum cleaner system according to an embodiment of the present disclosure.

FIG. 18 is a diagram for explaining a state in which a support frame is coupled with a cleaner station coupled to a connection assembly for a cleaner system according to an embodiment of the present disclosure.

FIG. 19 is a diagram for explaining a state in which a support plate cover is coupled with a cleaner station coupled to a connection assembly for a cleaner system according to an embodiment of the present disclosure.

FIG. 20 is a perspective view for explaining a cleaner system according to another embodiment of the present disclosure.

FIG. 21 is a side view for explaining a connection assembly for a cleaner system according to another embodiment of the present disclosure.

FIG. 22 is a block diagram for explaining a connection relationship of power in a cleaner system according to another embodiment of the present disclosure.

Mode for Invention

[0046] Hereinafter, preferred embodiments of the present disclosure will be described in detail with reference to the accompanying drawings.

[0047] As the present disclosure can have various embodiments as well as can be diversely changed, specific embodiments will be illustrated in the drawings and described in detail. While the present disclosure is not limited to particular embodiments, all modification, equivalents and substitutes included in the spirit and scope of the present disclosure are understood to be included therein.

[0048] Terms used in the present specification are provided for description of only specific embodiments of the present disclosure, and not intended to be limiting. An expression of a singular form includes the expression of plural form thereof unless otherwise explicitly mentioned in the context.

[0049] Unless otherwise defined, all terms used herein including technical and scientific terms have the same meaning as commonly understood by one of ordinary skill in the art to which the present disclosure belongs. Terms, for example, commonly used terms defined in the dictionary, are to be construed to have exactly the same meaning as that of related technology in the context. As long as terms are not clearly defined in the present application, the terms should not be ideally or excessively construed as formal meaning.

[0050] FIG. 1 is a perspective view for explaining a cleaner system according to an embodiment of the present disclosure, and FIG. 2 is an exploded perspective view for explaining a connection assembly for a cleaner system according to an embodiment of the present disclosure.

[0051] Referring to FIGS. 1 and 2, a connection assembly for a cleaner system, cleaner station, and robot cleaner according to an embodiment of the present disclosure will be described as follows.

[0052] A connection assembly 1 may be coupled to a cleaner station 2, charging stand 4, and robot cleaner coupling plate 5. Here, it is possible that the cleaner station 2, charging stand 4, and robot cleaner coupling plate 5 may be coupled to the connection assembly 1, and some of the cleaner station 2, charging stand 4, and robot cleaner coupling plate 5 may be also coupled to the connection assembly 1.

[0053] The connection assembly 1 may be coupled to the cleaner station 2 on the upper side thereof, and the charging stand 4 and robot cleaner coupling plate 5 may be coupled to the lower side of the cleaner station 2. Here, the cleaner 3 may be coupled to the cleaner station 2, and the robot cleaner 6 may be coupled to the robot cleaner coupling plate 5. Therefore, in a state in which both the cleaner 3 and the robot cleaner 6 are combined, the robot cleaner 6 may be placed on the lower side of the cleaner 3.

[0054] The specific structure of the connection assembly 1 will be described later.

[0055] FIG. 3 is a cross-sectional view for explaining a cleaner and cleaner station in a cleaner system according to an embodiment of the present disclosure.

[0056] Referring to FIGS. 1 to 3, the cleaner 3 and cleaner station 2 in the cleaner system according to an embodiment of the present disclosure are described as follows.

[0057] The cleaner station 2 is coupled to the cleaner 3. The cleaner 3 may be coupled to the side surface of the cleaner station 2. The cleaner station 2 is coupled to a dust bin 32 of the cleaner 3 and may remove dust stored in the dust bin 32. The dust stored in the dust bin 32 may be collected and captured in the cleaner station 2. In addition, the cleaner station 2 may supply power to the cleaner 3 to charge a battery (not shown) of the cleaner 3.

[0058] The cleaner station 2 may include a housing 21. The housing 21 may form an external appearance of the cleaner station 2. In particular, the housing 21 may be formed in the form of a column including one or more outer wall surfaces. For example, the housing 21 may be formed in a shape similar to a quadrangular column.

[0059] Although not shown, the housing 21 may have a space capable of accommodating a dust collecting part that stores dust therein and a dust collecting motor that generates a flow force to collect dust into the dust collecting part.

[0060] The housing 21 may include a bottom surface 21a, an outer wall surface 21b, and an upper surface 21c.

[0061] The bottom surface 21a forms a lower external appearance of the cleaner station 2. The bottom surface 21a may be disposed at the lowermost side of the cleaner station 2. That is, the lower surface 21a may support the lower side of the dust collecting motor.

[0062] The bottom surface 21a may be disposed toward the ground. The bottom surface 21a may be arranged parallel to the ground. With this configuration, the dust collecting motor may be stably supported, and the overall weight may be balanced even when the cleaner 3 is coupled.

[0063] The bottom surface 21a is formed to have the largest diameter in the cleaner station 2. That is, the bottom surface 21a of the cleaner station 2 has the largest front-to-back length and left-right length. Accordingly, the bottom surface 21a is formed to have the largest horizontal area (direction parallel to the ground). With this configuration, the bottom surface 21a increases the area in contact with the ground, thereby preventing the cleaner station 2 from falling over and maintaining its balance.

[0064] The outer wall surface 21b may mean a surface formed in the gravitational direction or a surface connected to the bottom surface 21a. For example, the outer wall surface 21b may mean a surface connected to the bottom surface 21a so as to be perpendicular to the bottom surface 21a.

[0065] The outer wall surface 21b may include at least one surface. For example, the outer wall surface 21b may be configured of four surfaces connected to each other.

[0066] Meanwhile, the directions are defined as follows to understand the present embodiment. In the present embodiment, the directions may be defined in the state in which the cleaner 3 is mounted on the cleaner station 2.

[0067] When the cleaner 3 is mounted on the cleaner station 2, a direction in which the cleaner 3 is disposed based on the inner space of the housing 21 may be referred to as a front surface of the cleaner station 2, and a surface of the cleaner 3 exposed to the outside of the cleaner station 2 may be referred to as a front surface of the cleaner station 2.

[0068] In addition, a surface facing the front surface based on the inner space of the housing 21 may be referred to as a rear surface of the cleaner station 2.

[0069] In addition, on the basis of the internal space of the housing 21, a left surface when viewing the front surface may be referred to as a left surface, and a right surface when viewing the front surface may be referred to as a right surface.

[0070] The outer wall surface 21b may be formed in the form of a flat surface, or the outer wall surface 21b may be formed in the form of a curved surface as a whole or formed to partially include a curved surface.

[0071] The outer wall surface 21b may have an external appearance corresponding to the shape of the cleaner 3. In detail, a coupling part 22 may be disposed on the outer wall surface 21b. With this configuration, the cleaner 3 may be coupled to the cleaner station 2 and supported by the cleaner station 2.

[0072] The upper surface 21c may form an upper external appearance of the cleaner station. That is, the upper surface 21c may mean a surface disposed at an outermost side of the cleaner station in the gravitational direction and exposed to the outside.

[0073] For reference, in the present embodiment, the terms upper side and lower side may mean the upper and lower sides in the gravitational direction (a direction perpendicular to the ground surface) in the state in which the cleaner station 2 is installed on the ground surface.

[0074] In this case, the upper surface 21c may also be disposed in parallel with the ground surface or disposed to be inclined at a predetermined angle with respect to the ground surface.

[0075] A display unit (not illustrated) may be disposed on the upper surface 21c. For example, the display unit (not illustrated) may display a state of the cleaner station 2, a state of the cleaner 3, or a state of the robot cleaner 6. The display unit may further display information such as a cleaning process situation, a map of the cleaning zone, and the like.

[0076] Meanwhile, according to an embodiment, the upper surface 21c may be separable from the outer wall surface 21b. In this case, when the upper surface 21c is separated, the battery separated from the cleaner 3 may be accommodated in the internal space surrounded by the outer wall surface 21b, and a terminal (not illustrated) capable of charging the separated battery may be provided.

[0077] The cleaner station 2 may include the coupling part 22 to which the cleaner 3 is coupled. Specifically, the coupling part 22 may be disposed in the outer wall surface 21b, and the main body 31, dust bin 32, and battery housing 34 of the cleaner 3 may be coupled to the coupling part 22.

[0078] The coupling part 22 may include a coupling surface. The coupling surface may be disposed on the lateral surface of the housing 21. For example, the coupling surface may mean a surface formed in the form of a groove which is concave toward the inside of the cleaner station 2 from the outer wall surface 21b. That is, the coupling surface may mean a surface formed to have a stepped portion with respect to the outer wall surface 21b.

[0079] Although not illustrated, the coupling surface may have a dust passage hole through which air outside the housing 21 may be introduced into the housing 21. The dust passage hole may be formed in the form of a hole corresponding to the shape of the dust bin 32 so that the dust in the dust bin 32 may be introduced into the dust collecting part. The dust passage hole may be formed to correspond to the shape of the discharge cover of the dust bin 32. The dust passage hole may be formed to communicate with a flow path formed inside the cleaner station 2.

[0080] The coupling part 22 may be formed in a shape corresponding to the outer surface of the dust bin 32 and battery housing 34 of the cleaner 3. With this configuration, when the user combines the cleaner 3 with the cleaner station 2, the cleaner 3 and cleaner station 2 may be stably disposed on the coupling part 22.

[0081] Meanwhile, although not illustrated, a terminal that may supply power to the battery of the cleaner 3 may be disposed in the coupling part 22. With this configuration, when the cleaner 3 is coupled to the cleaner station 2, power is supplied to the battery of the cleaner 3 to empty the dust bin 32 of the cleaner 3 and at the same time the battery of the cleaner 3 may be charged, thereby providing the convenience of charging.

[0082] Although not illustrated, the cleaner station 2 may include a fixing unit. The fixing unit may fix the cleaner 3 coupled to the coupling part 22. Specifically, the fixing unit may fix the dust bin 32 and the battery housing 34 of the cleaner 3 that are coupled to the coupling part 22. For example, the fixing unit may pressurize and fix the dust bin 32 and the battery housing 34 while a fixing member (not illustrated) moves in a straight line according to the operation of a fixing unit motor (not illustrated).

[0083] The cleaner station 2 may include a door unit 23. The door unit 23 is configured to open and close the dust passage hole that communicates with the dust bin 32 of the cleaner 3. The door unit 23 may include a door hinged to an engaging surface and a door motor that applies power to rotate the door. Therefore, the dust passage hole may be opened and closed while the door rotates by the operation of the door motor.

[0084] The cleaner station 2 may include a cover opening unit 24 that opens a discharge cover that opens and closes the dust bin 32 of the cleaner 3.

[0085] When the cleaner 3 is coupled to the cleaner station 2, the cover opening unit 24 may press a lever provided on the dust bin 32. When the lever is pressed, the discharge cover hooked to the dust bin 32 may be separated from the dust bin 32. In addition, the discharge cover may be rotated away from the dust bin 32 by the elastic force of a torsion spring provided on a hinge axis that hinges the dust bin 32 and the discharge cover.

[0086] The cleaner station 2 may include a dust collecting part 25. The dust collecting part 25 may be disposed inside the housing 21. The dust collecting part 25 may be disposed on the lower side of the coupling part 22 in the gravitational direction. For example, the dust collecting part 25 may refer to a dust bag that collects dust sucked from the inside of the dust bin 32 of the cleaner 3 by a dust collecting motor.

[0087] The dust collecting part 25 may be coupled to the housing 21 in an attachable and detachable manner. Accordingly, the dust collecting part may be separated from the housing 21 and discarded, and a new dust collecting part 25 may be coupled to the housing 21. That is, the dust collecting part 25 may be defined as a consumable part.

[0088] When a suction force is generated by the dust collecting motor, the volume of the dust collecting part 25 may increase and dust is received in the dust collecting part.

[0089] To this end, the dust collecting part 25 may be

made of a material that transmits air but does not transmit foreign substances such as dust. For example, the dust collecting part 25 may be made of a non-woven fabric material and may have a hexahedral shape based on an increase in volume. Therefore, it is not necessary for the user to separately bind a bag in which the dust is captured, and as a result, it is possible to improve convenience for the user.

[0090] Alternatively, the dust collecting part 25 may be formed of a permeable material. For example, the dust collecting part 25 may include roll vinyl (not illustrated). With this configuration, when the dust collecting part 25 is sealed or joined, dust or bad odors collected inside the dust collecting part 25 may be prevented from leaking out of the dust collecting part 25. Here, the dust collecting part 25 may be mounted on the housing 21 through a dust bag cartridge (not illustrated). If necessary, the dust collecting part 25 may be replaced through a dust bag cartridge.

[0091] The cleaner station 2 may include a flow path part 26. The flow path part 26 may connect the dust bin 32 of the cleaner 3 to the dust collecting part 25. The flow path portion 26 may be disposed on the rear side of the coupling surface. The flow path portion 26 may refer to a space between the dust bin 32 of the cleaner 3 and the dust collecting part 25. The flow path portion 26 may be a space formed at a rear side of the dust passing hole, or may be bent downward from the dust passing hole and be a flow path through which dust and air may flow.

[0092] The cleaner station 2 may include a dust collecting motor 27. The dust collecting motor 27 may generate suction force by rotation. For example, the dust collecting motor 27 includes an impeller, and when the dust collecting motor 27 operates, the impeller rotates to generate air flow. The dust collecting motor 27 may be disposed at the bottom of the dust collecting part. The dust collecting motor 27 may apply suction force to the flow path part 26. Through this, the dust collecting motor 27 may provide suction power to suck dust in the dust bin 32 of the cleaner 3.

[0093] Meanwhile, in this embodiment, a virtual dust collecting motor axis C may be formed by extending the rotation axis of the dust collecting motor 27.

[0094] In addition, the cleaner station 2 may further include a side door (not illustrated). The side door may be disposed in the housing 21. The side door may selectively expose the dust collecting part 25 to the outside. Through this, the user may easily remove the dust collecting part 25 from the cleaner station 2.

[0095] The cleaner 3 may mean a cleaner configured to be manually operated by a user. For example, the cleaner 3 may mean a handheld cleaner or a stick cleaner.

[0096] The cleaner 3 may be mounted on the cleaner station 2. For example, the cleaner 3 may be supported by the cleaner station 2. The cleaner 3 may be coupled to the cleaner station 2. The cleaner 3 may be coupled to the side surface of the housing 21.

[0097] Particularly, the cleaner main body 31 of the cleaner 3 may be mounded on the coupling part 22. In this case, a central axis of the dust bin 32 may be disposed in a direction parallel to the ground surface, and the extension tube 38 may be disposed in a direction perpendicular to the ground surface

[0098] Meanwhile, in the embodiment of the present disclosure, directions may be defined on the basis of when a bottom surface (lower surface) of the dust bin 32 and a bottom surface (lower surface) of the battery housing 34 are placed on the ground surface.

[0099] In this case, a front may mean a direction in which a suction part 33 is disposed based on the cleaner main body 31 in which the suction motor 35 is accommodated, and a rear may mean a direction in which the handle 37 is disposed based on the cleaner main body 31. In addition, in the embodiment of the present disclosure, upper and lower sides may be defined in a direction perpendicular to the ground surface on the basis of the state in which the bottom surface (lower surface) of the dust bin 32 and the bottom surface (lower surface) of the battery housing 34 are placed on the ground surface.

[0100] The cleaner 3 may include the cleaner main body 31. The cleaner main body 31 may form an external appearance of the cleaner 3.

[0101] The cleaner main body 31 may be provided with a dust separating part 36 and the suction motor 35.

[0102] The dust separating part 36 may separate dust from the air sucked in through the suction part 33. A space in the dust separating part 36 may communicate with a space in the dust bin 32. For example, the dust separating part 36 may have one or more cyclone parts capable of separating dust by using a cyclone flow. Therefore, air and dust, which are introduced through the suction part 33, may generate a cyclone flow in the internal space of the dust separating part 36.

[0103] The dust separating part 36 may further include a secondary cyclone that re-separates dust from the air discharged from the cyclone. In this case, the secondary cyclone may be located inside the cyclone so that the size of the dust separating part 36 is minimized. The secondary cyclone may include a plurality of cyclone bodies arranged in parallel. The air discharged from the cyclone may be divided and passed through a plurality of cyclone bodies.

[0104] The suction motor 35 may generate a suction force for sucking air. The suction motor 35 may generate the suction force by rotating. For example, the suction motor 35 may be provided with an impeller and may generate air flow according to rotation when the suction motor 35 is driven.

[0105] The cleaner 3 may include the dust bin 32. The dust bin 32 may communicate with the dust separating part 36. The dust bin 32 may store the dust separated by the dust separating part.

[0106] The dust bin 32 may provide a space capable of storing the dust separated by the dust separating part. For example, the dust bin 32 may be formed in a shape

similar to a cylindrical shape.

[0107] A part of a lower side (bottom surface) of the dust bin 32 may be opened. In particular, the lower side of the dust bin 32 may be opened through a discharge cover (not illustrated).

[0108] The discharge cover (not illustrated) may be provided to open and close one end of the dust bin 32 in the longitudinal direction. In particular, the discharge cover may selectively open or close the lower portion of the dust bin 32 which is opened downward.

[0109] The discharge cover may be coupled to the dust bin 32. The discharge cover may rotate downward based on a hinge shaft. The hinge may be provided with a torsion spring. Thus, when the discharge cover is separated from the dust bin 32, the discharge cover may be supported at a predetermined angle or greater based on the hinge shaft in the dust bin 32 by elasticity of the torsion spring.

[0110] When the discharge cover is closed, the lower side of the dust bin 32 may be blocked (sealed).

[0111] The dust bin 32 may include a dust bin compression lever. The dust bin compression lever may be disposed outside the dust bin 32. The dust bin compression lever may be disposed outside the dust bin 32 so as to be movable upward and downward. The dust bin compression lever may be connected to a compression member (not illustrated). When the dust bin compression lever is moved downward by an external force, the compression member (not illustrated) may also be moved downward. Through this, it is possible to provide convenience for the user. The compression member (not illustrated) and the dust bin compression lever may return back to original positions by an elastic member (not illustrated). In particular, when the external force applied to the dust bin compression lever is eliminated, the elastic member may move the dust bin compression lever and the compression member (not illustrated) upward.

[0112] The compression member (not illustrated) may be disposed inside the dust bin 32. The compression member may move in the internal space of the dust bin 32. In particular, the compression member may move upward and downward in the dust bin 32. Through this, the compression member may compress downward the dust in the dust bin 32.

[0113] The suction part 33 may protrude outward from the cleaner main body 31. For example, the suction part 33 may be formed in a cylindrical shape. The suction part 33 may communicate with an extension tube 38. The suction part 33 may provide a flow path (hereinafter, referred to as a 'suction flow path') through which air containing dust may flow.

[0114] The cleaner 3 may include the battery housing 34. A battery (not illustrated) may be accommodated in the battery housing 34. The battery housing 34 may be disposed at a lower side of the handle 37. For example, the battery housing 34 may have a hexahedral shape opened at a lower side thereof. A rear surface of the battery housing 34 may be connected to the handle 37.

[0115] The battery housing 34 may include an accommodation portion opened at a lower side thereof. A battery (not illustrated) may be detached through the accommodation portion of the battery housing 34

[0116] The cleaner 3 may include a battery (not illustrated).

[0117] The battery (not illustrated) may supply power to the suction motor of the cleaner 3. The battery may be disposed on a lower portion of the handle 37. The battery may be disposed at a rear side of the dust bin 32.

[0118] The handle 37 may be configured to be grasped by the user. The handle 37 may be disposed at a rear side of the suction motor 35. For example, the handle 37 may be formed in a shape similar to a cylindrical shape. Alternatively, the handle 37 may be formed in a curved cylindrical shape. The handle 37 may be disposed at a predetermined angle with respect to the main body housing the suction motor 35, or the dust separating part 36.

[0119] The handle 37 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 in the longitudinal direction (axial direction) of the grip portion and extending toward the cleaner main body 31, and a second extension portion connected to the other end in the longitudinal direction (axial direction) of the grip portion and extending toward the dust bin 32.

[0120] An upper surface of the handle 37 may form an external appearance of a part of an upper surface of the cleaner 3. Therefore, it is possible to prevent a component of the cleaner 3 from coming into contact with the user's arm when the user grasps the handle 37.

[0121] An operating part may be disposed on the handle 37. The operating part may be disposed on an inclined surface formed in an upper region of the handle 37. The user may input an instruction to operate or stop the cleaner 3 through the operating part.

[0122] The cleaner 3 may include the extension tube 38. The extension tube 38 may communicate with a cleaning module 39. The extension tube 38 may communicate with the cleaner main body 31. The extension tube 38 may communicate with the suction part 33 of the cleaner main body 31. The extension tube 38 may be formed in a long cylindrical shape.

[0123] The cleaner main body 31 may be connected to the extension tube 38. The cleaner main body 31 may be connected to the cleaning module 39 through the extension tube 38. The cleaner main body 31 may generate the suction force by means of the suction motor 35 and provide the suction force to the cleaning module 39 through the extension tube 38. The outside dust may be introduced into the cleaner main body 31 through the cleaning module 39 and the extension tube 38.

[0124] The cleaner 3 may include the cleaning module 39. The cleaning module 39 may communicate with the extension tube 38. Therefore, the outside air may be introduced into the cleaner main body 31 of the cleaner 3 via the cleaning module 39 and the extension tube 38 by the suction force generated in the cleaner main body 31 of the cleaner 3.

[0125] FIG. 4 is a perspective view for explaining a charging stand in a cleaner system according to an embodiment of the present disclosure.

[0126] Referring to FIG. 4, a charging stand 4 in the cleaner system according to an embodiment of the present disclosure will be described as follows.

[0127] The charging stand 4 includes a charging stand housing 41 for accommodating a power module inside and a bottom plate 42 coupled to the bottom of the charging stand housing 41 and on which a charging terminal 43 is disposed.

[0128] The charging stand housing 41 forms an external appearance of the charging stand 4 and forms a space inside. A power module is accommodated in the internal space of the charging stand housing 41. Other electronic equipment may be accommodated in the internal space of the charging stand housing 41.

[0129] In a state in which the robot cleaner 6 is coupled to the robot cleaner coupling plate 5, the charging stand housing 41 may be disposed in front of the robot cleaner 6 and may be formed in a pillar shape. Thus, when the robot cleaner 6 is out of the space to which the robot cleaner 6 is coupled, the charging stand housing 41 may perform the function of a stopper.

[0130] The bottom plate 42 is a component that fastens the charging stand housing 41 and the robot cleaner coupling plate 5.

[0131] The bottom plate 42 is coupled to the bottom of the charging stand housing 41. Alternatively, the bottom plate 42 may be formed integrally with the charging stand housing 41 at the bottom of the charging stand housing 41. The bottom plate 42 is formed in a plate shape widely arranged in a horizontal direction.

[0132] With this configuration, the bottom plate 42 may contact the ground or bottom surface on which the charging stand 4 is installed so that the bottom plate 42 may support the charging stand housing 41. Even if the robot cleaner 6 collides with the charging stand housing 41, it may prevent the charging stand housing 41 from falling.

[0133] The robot cleaner coupling plate 5 is coupled to the upper surface of the bottom plate 42.

[0134] The bottom plate 42 is provided with a charging terminal 43. The charging terminal 43 is disposed to protrude upward in the upper side of the bottom plate 42. The charging terminal 43 forms a step with the upper side of the bottom plate 42 to guide the robot cleaner coupling plate 5 to be coupled at a correct position.

[0135] The charging terminal 43 is an device for charging the battery disposed in the robot cleaner 6 and is electrically connected to the robot cleaner 6. The charging terminal 43 upwardly protrudes from the bottom plate 42, and is electrically connected to the power module accommodated in the charging stand housing 41.

[0136] FIG. 5 is a perspective view for explaining a robot cleaner coupling plate in a cleaner system according to an embodiment of the present disclosure.

[0137] Referring to FIG. 5, a robot cleaner coupling plate in a cleaner system according to an embodiment of the present disclosure will be described below.

[0138] A robot cleaner is coupled to the upper portion of the robot cleaner coupling plate 5. The robot cleaner coupling plate 5 is optionally mounted on the bottom plate 42.

[0139] The robot cleaner coupling plate 5 is disposed on the upper portion of the bottom plate 42, at least a portion of the robot cleaner coupling plate is disposed to overlap the bottom plate 42 vertically.

[0140] The robot cleaner coupling plate 5 includes a coupling plate main body 51. The robot cleaner 6 is coupled to the coupling plate main body 51. The coupling plate main body 51 is formed to correspond to the form of the body 61 of the robot cleaner 6. For example, the coupling plate main body 51 may be formed in the form of a disc. In another example, the coupling plate main body 51 may be formed in a square plate form.

[0141] The robot cleaner coupling plate 5 may further include a corresponding surface 52 corresponding to the bottom plate 42 of the charging stand 4.

[0142] The corresponding surface 52 is disposed to overlap the bottom plate 42 vertically, and further protrudes upward.

[0143] The lower surface of the corresponding surface 52 is in contact with the upper surface of the bottom plate 42. The lower surface of the corresponding surface 52 may be further depressed from the bottom of the robot cleaner coupling plate 5, and the bottom plate 42 may be inserted into the lower surface of the corresponding surface to fix the position of the robot cleaner coupling plate 5.

[0144] In the robot cleaner coupling plate 5, a terminal through hole 53 may be formed so that the charging terminal 43 penetrates and exposed to the outside. Specifically, the charging terminal 43 penetrates the terminal through hole upward from below, and the upper end of the charging terminal 43 protrudes from the upper portion of the robot cleaner coupling plate 5.

[0145] A separation prevention wall 54 is formed protruding at the front end of the robot cleaner coupling plate 5.

[0146] The separation prevention wall 54 is disposed in the front portion of the robot cleaner coupling plate 5 and is formed by protruding upward from the outer circumferential surface of the robot cleaner coupling plate 5.

[0147] The front portion of the robot cleaner coupling plate 5 refers to the front with respect to a straight line connecting the left and right ends of the robot cleaner coupling plate 5. The separation prevention wall 54 is disposed in the front portion of the robot cleaner coupling plate 5, so it prevents the robot cleaner that has entered from the rear from moving further forward and leaving the robot cleaner coupling plate 5.

[0148] For example, the robot cleaner 6 is formed in a circular shape when viewed from the top, and the robot cleaner coupling plate 5 may be formed in a circular shape according to the shape of the robot cleaner 6. Here, the separation prevention wall 54 protrudes up-

ward from the outer circumferential surface of the robot cleaner coupling plate 5, and may be formed in an arc shape according to the shape of the robot cleaner.

[0149] When the robot cleaner 6 enters from the side, it collides with the rear end of the separation preventing wall 54. With this configuration, the separation preventing wall 54 may easily guide the robot cleaner 6 into the robot cleaner coupling plate 5.

[0150] According to an embodiment, a reaction force removal groove 55 may be formed in the robot cleaner coupling plate 5.

[0151] The reaction force removal groove 55 is a component that removes the reaction force caused by the rotation of the robot cleaner 6, so that the robot cleaner 6 is more easily coupled.

[0152] The reaction force removal groove 55 is formed by being recessed downward from the robot cleaner coupling plate 5, and is disposed to vertically overlap with at least a portion of the rotation cleaner 6 when the robot cleaner 6 is coupled.

[0153] In the rotation plate of the robot cleaner 6, based on the rotation shaft, the outer portion of the rotation shaft generates a driving force, and the inner portion of the rotation shaft generates a reaction force. For example, when the robot cleaner 6 is driven, a pair of rotation plates rotate in opposite directions when viewed from the top. Here, the outer portions of the pair of rotation plates cause friction with the floor to advance the robot cleaner, thereby providing a driving force. Conversely, the inner portions of the pair of rotation plates generate friction with the floor to provide a reaction force that prevents the robot cleaner from moving forward. In this case, the reaction force removal groove 55 is disposed between the pair of rotation plates, which serves to remove the reaction force.

[0154] In addition, the reaction force removal groove 55 collects water remaining in the mop of the robot cleaner 6.

[0155] The robot cleaner 6 is coupled to the upper portion of the robot cleaner coupling plate 5. The robot cleaner 6 enters the charging stand 4 after the driving for cleaning is completed. The robot cleaner 6 climbs the robot cleaner coupling plate 5 and couples to the upper portion of the robot cleaner coupling plate 5. When the robot cleaner 6 is coupled, the charging terminal 43 of the charging stand 4 and the corresponding terminal of the robot cleaner 6 contacts each other. That is, the robot cleaner 6 is coupled to the upper portion of the robot cleaner coupling plate 5 and is electrically connected to the charging stand 4 and charged.

[0156] The robot cleaner 6 may be placed on the floor surface and clean the floor surface using a mop while moving along the floor surface. Accordingly, hereinafter, in a description of the robot cleaner 6, a vertical direction is set based on a state in which the robot cleaner 6 is placed on the floor surface.

[0157] The robot cleaner 6 includes a robot cleaner body 61 The robot cleaner body 61 may form an overall appearance of the robot cleaner 6. Each component constituting the robot cleaner 6 may be coupled to the robot cleaner body 61, and some components constituting the robot cleaner 6 may be accommodated within the robot cleaner body 61. For example, components including a battery, water tank, and motor may be provided inside the robot cleaner body 61.

[0158] Although not illustrated, a pair of rotation plates may be rotatably disposed on the lower side of the robot cleaner body 61. The pair of rotation plates may be formed to have a predetermined area, and may be formed in the form of a flat plate or a flat frame. The rotation plates may be generally positioned to extend substantially horizontally. As such, a width (or diameter) of the rotation plates in the horizontal direction may be set to be sufficiently larger than the height of the rotation plates in the vertical direction. The rotation plates coupled to the robot cleaner body 61 may be in parallel to the floor surface B, or the rotation plates may be positioned to be inclined with respect to the floor surface B. The rotation plate may be in the shape of a circular plate, the bottom of the rotation plate may be generally circular, and the pair of rotation plates may be symmetrical to each other.

[0159] Further, a pair of mops 62 may be coupled to the lower side of the pair of rotation plates.

[0160] The mop may be formed so that a bottom surface thereof that faces the floor has a predetermined area, and the mop has a flat shape. That is, the mop may have a shape in which a width (or diameter) in the horizontal direction of the mop may be significantly greater than a height of the mop in the vertical direction. When the mop is coupled to the robot cleaner body 61, the bottom surface of the mop may be positioned substantially parallel to the floor surface B or may be inclined with respect to the floor surface B.

[0161] The bottom surface of the mop may be generally circular, and the pair of mops may be formed in a symmetrical form. In addition, the mop may be attached and detached to the bottom of the rotation plate, and may be coupled to the rotation plate and rotate together with the rotation plate.

[0162] The rotation plate may rotate clockwise or counterclockwise, and when a pair of rotation plates rotate in opposite directions at the same speed, the robot cleaner may move in a straight direction and may move forward or backward.

[0163] When only one of the pair of rotation plates rotates, the robot cleaner 6 may change direction and may thus turn.

[0164] When the rotational speeds of the pair of rotation plates are different, or when the pair of rotation plates are rotated in the same direction, the robot cleaner 6 may move while changing direction, and thus move in a curvilinear direction.

[0165] The robot cleaner 6 may include at least one sensor and detect a distance to obstacles such as furniture, office supplies, or walls installed in the cleaning area. In addition, the robot cleaner may move to avoid ob-

stacles, move to a pre-entered cleaning area, and clean the floor surface by moving according to a preset driving pattern.

[0166] The robot cleaner 6 may be coupled to the robot cleaner coupling plate 5. The robot cleaner 6 includes at least one sensor to detect the position of the robot cleaner coupling plate 5, may move toward the robot cleaner coupling plate 5, and may be coupled to the robot cleaner coupling plate 5.

[0167] Here, the battery provided inside the robot cleaner 6 may be charged by receiving power from the charging stand 4.

[0168] The robot cleaner 6 is provided with a corresponding terminal corresponding to the charging terminal 43. The corresponding terminal may be formed to protrude downward from the lower surface of the robot cleaner body 61 to be electrically connected to the charging terminal 43.

[0169] Although not illustrated, unlike the above, the robot cleaner 6 may automatically clean the area to be cleaned by sucking in foreign substances such as dust from the floor while driving on its own in the area to be cleaned.

[0170] To this end, an suction port may be formed in the robot cleaner body 61, a suction motor for suction of air may be provided inside the robot cleaner body 61, and a robot cleaner dust bin for collecting the sucked dust may be provided.

[0171] In addition, the robot cleaner body 61 may be further provided with an agitator that sweeps dust from the floor surface by rotation to improve the cleaning effect.

[0172] Meanwhile, depending on embodiments, the robot cleaner 6 may be provided with a pair of wheels rather than a rotation plate and a mop.

[0173] FIGS. 6 to 9 are perspective views of a state in which a charging stand and robot cleaner coupling plate are coupled to a connection assembly in a cleaner system according to an embodiment of the present disclosure. FIGS. 10 and 11 are perspective views for explaining a connection assembly in a vacuum cleaner system according to an embodiment of the present disclosure. FIG. 12 is a perspective view for explaining a support frame in a connection assembly according to an embodiment of the present disclosure. FIGS. 13 and 14 are perspective views for explaining a support plate cover in a connection assembly according to an embodiment of the present disclosure.

[0174] The connection assembly 1 of the present disclosure will be described with reference to FIGS. 6 to 14 as follows.

[0175] The connection assembly 1 may be connected to the cleaner station 2, charging stand 4, and robot cleaner coupling plate 5. Specifically, the cleaner station 2 is coupled to the upper side of the connection assembly 1, the charging stand 4 is accommodated inside the connection assembly 1, and the charging stand 4 and robot cleaner coupling plate 5 are coupled to the connection assembly.

[0176] Accordingly, the charging stand 4 may be disposed on the lower side of the cleaner station 2 through the connection assembly 1, and the robot cleaner coupling plate 5 may be disposed on one side of the charging stand 4. With this configuration, when the cleaner 3 is coupled to the cleaner station 2 and the robot cleaner 6 is coupled to the robot cleaner coupling plate 5, the cleaner 3 may be disposed on the upper side of the robot cleaner 6. That is, the charging stand 4 may be disposed vertically below the cleaner station 2, and the robot cleaner 6 may be disposed vertically below the cleaner 3.

[0177] Therefore, according to the present disclosure, the cleaner station 2, cleaner 3, charging stand 4, robot cleaner coupling plate 5, and robot cleaner 6 may be densely disposed in one space, and space efficiency may be improved.

[0178] In addition, by disposing the cleaner station 2 and charging stand 4 up and down, the wires and/or outlets connecting power to the cleaner station 2 and charging stand 4 may be collected and organized. In particular, if there is excess length of wire or if it is desired to avoid exposure of the outlet, the remaining wires and/or outlets may be collected and organized in the rear space of the charging stand 4 (i.e., the lower space of the cleaner station 2).

[0179] Meanwhile, for understanding of this embodiment, a direction is defined as follows. In this embodiment, a direction may be defined while the charging stand 4 and robot cleaner coupling plate 5 are coupled to the connection assembly 1.

[0180] When the charging stand 4 and robot cleaner coupling plate 5 are coupled to the connection assembly 1, a direction in which the robot cleaner coupling plate 5 is disposed with respect to the charging stand 4 may be referred to as the front of the connection assembly 1.

[0181] In addition, a direction in which a wire organizer 400 is disposed based on the charging stand 4 may be referred to as the rear of the connection assembly 1.

[0182] The connection assembly 1 includes a station coupling part 100, a charging stand coupling part 200, a connection wall 300, and the wire organizer 400.

[0183] Here, the station coupling part 100 is disposed on the upper side of the charging stand coupling part 200, and the charging stand coupling part 200 and station coupling part 100 are connected through the connection wall 300. In addition, the wire organizer 400 may be disposed between a pair of connecting walls 300.

[0184] The station coupling part 100 forms the upper external appearance of the connection assembly 1, and the cleaner station 2 is coupled thereto.

[0185] The station coupling part 100 is disposed on the upper side of the charging stand coupling part 200, and the distance from the charging stand coupling part 200 is maintained through the connection wall 300. Accordingly, when the connection assembly 1 is disposed on the ground, the station coupling part 100 may be located at a predetermined height from the ground. In addition,

a space may be formed at a predetermined interval between the station coupling part 100 and the charging stand coupling part 200, and the charging stand 4 may be disposed in the space. With this configuration, the connection assembly 1 may arrange the cleaner station 2 and charging stand 4 in the vertical direction and reduce the space they occupy on a plane.

[0186] The station coupling part 100 includes a station support plate 110, a support frame 120, and a support plate cover 130. The support frame 120 is coupled to the upper side of the station support plate 110, and the support plate cover 130 is coupled to the upper side of the station support plate 110 and support frame 120. That is, the support frame 120 is coupled between the station support plate 110 and the support plate cover 130.

[0187] The cleaner station 2 is coupled to the upper side of the station support plate 110. The station support plate 110 may support the cleaner station 2 coupled to the upper side. The station support plate 110 is disposed to face the lower surface 21a of the cleaner station 2 and is in contact with the lower surface 21a.

[0188] For example, the station support plate 110 may be formed in a shape similar to a square plate. Here, the front-to-back width and left-right width of the station support plate 110 are formed to be larger than the front-to-back width and left-right width of the lower surface 21a of the cleaner station 2, respectively. With this configuration, the station support plate 110 may stably accommodate and support the cleaner station 2.

[0189] In addition, in the station coupling part, the front-to-back width may be larger than the left-right width. Accordingly, even when the cleaner 3 is coupled to the cleaner station 2, at least a portion of the station support plate 110 may be disposed vertically below the cleaner 3. With this configuration, it is possible to prevent foreign substances from falling from the cleaner 3 into the robot cleaner 6, and even if the cleaner 3 separates from the cleaner station 2 and falls, the collision with the robot cleaner 6 may be prevented.

[0190] Depending on embodiment, at least one rib may be protruding from the station support plate 110. The rib may be fitted with the support protrusion 133 of the support plate cover 130, which will be described later. With this configuration, the overall weight of the connection assembly 1 may be reduced while maintaining the support force of the connection assembly 1.

[0191] Depending on embodiments, a hook receiving groove 114 may be formed in the station support plate 110. The hook receiving groove 114 may be coupled to a hook formed on the support plate cover 130, which will be described later. With this configuration, the station support plate 110 and support plate cover 130 may be hook-coupled.

[0192] A station receiving groove 111 is formed in the station support plate 110. The station receiving groove 111 may be recessed downward from the station support plate 110.

[0193] The station receiving groove 111 is formed to correspond to the shape of the lower surface 21a of the cleaner station 2. For example, the station receiving groove 111 may be formed in a square groove shape. The width at which the station receiving groove 111 is formed may be equal to or greater than the width of the lower surface 21a of the cleaner station 2. The depth at which the station receiving groove 111 is formed may be equal to or greater than the height of the lower surface 21a of the cleaner station 2.

[0194] With this configuration, the lower surface 21a of the cleaner station 2 is accommodated in the station receiving groove 111.

[0195] A frame receiving groove 112 is formed in the station support plate 110. The frame receiving groove 112 may be recessed downward from the station support plate 110.

[0196] The frame receiving groove 112 is formed to correspond to the shape of the support frame 120. For example, the frame receiving groove 112 may be formed in a 'U' shaped groove. The frame receiving groove 112 may be formed to surround the outer edge of the station receiving groove 111.

[0197] With this configuration, the support frame 120 is accommodated in the frame receiving groove 112.

[0198] A charging stand guide groove 113 is formed on the station support plate 110. The charging stand guide groove 113 may be formed on the lower side of the station support plate 110.

[0199] The charging stand guide groove 113 is formed to correspond to the shape of the upper end of the charging stand housing 41. For example, the charging stand guide groove 113 may be formed in a shape similar to an oval groove.

[0200] With this configuration, the upper end of the charging stand housing 41 is accommodated in the charging stand guide groove 113. Therefore, the charging position of the charging stand housing 41 may be guided by the charging stand guide groove 113. In a state in which the charging stand 4 is coupled to the connection assembly 1, the charging stand 4 may be inserted and supported in the charging stand guide groove 113.

[0201] The support frame 120 is coupled to the station receiving groove 111 and may cover and support at least a portion of the lower surface 21a of the cleaner station 2.

[0202] The support frame 120 includes a frame main body 121, a coupling rib 122, and a fastening hole 123. Here, the coupling rib 122 may protrude and extend downward from the frame body 121, and a plurality of fastening holes 123 may be formed in the frame body 121.

[0203] The frame main body 121 may be formed to surround a portion of the outer wall surface 21b of the cleaner station 2. For example, the frame body 121 may be formed to surround three of the outer wall surfaces 21b of the cleaner station 2. That is, the frame main body 121 may be formed similar to a 'U' shape.

[0204] With this configuration, in a state in which the cleaner station 2 stands on the station coupling part 100,

the support frame 120 is inserted along the outer wall surface 21b of the cleaner station 2 and moves downward to cover the upper side of the lower surface 21a of the cleaner station 2.

[0205] The frame main body 121 may cover the lower surface 21a of the cleaner station 2 and fill a space between the support plate cover 130 and the lower surface 21a.

[0206] The upper surface of the lower surface 21a of the cleaner station 2 may be formed to be inclined at a predetermined angle with respect to the ground. Therefore, in a state in which the lower surface 21a of the cleaner station 2 is coupled to the station receiving groove 111, a space between the support plate cover 130 and the lower surface 21a or a space between the station receiving groove 111 and the lower surfaces 21a of the cleaner station 2 may be generated. Here, the frame body 121 may cover the upper portion of the lower surface 21a to fill a space between the support plate cover 130 and the lower surface 21a or a space between the station receiving groove 111 and the lower surface 21a.

[0207] With this configuration, when the support plate cover 130 covers the upper portion of the support frame 120, the support plate cover 130 and support frame 120 may press the upper portion of the lower surface 21a evenly, and the cleaner station 2 may be supported stably.

[0208] The coupling rib 122 is formed to protrude and extend downward from the frame main body 121 and may be accommodated in the frame receiving groove 112. Specifically, the coupling rib 122 extends downward from the outer end of the frame main body 121. Accordingly, when the coupling rib 122 is coupled to the frame receiving groove 112, the frame main body 121 may be arranged to cover the radial inner side of the frame receiving groove 112.

[0209] With this configuration, when the coupling rib 122 is coupled to the frame receiving groove 112, the frame main body 121 may cover the upper side of the lower surface 21a.

[0210] A plurality of fastening holes 123 are formed in the frame main body 121, and the support frame 120 and station support plate 110 may be screwed and fastened together through the fastening holes 123. For example, four fastening holes 123 may be formed in the frame main body 121 at predetermined intervals. With this configuration, the frame main body 121 may be fixed by uniformly pressing the lower surface 21a.

[0211] The support plate cover 130 is coupled to the station support plate 110 and may cover the lower surface 21a of the cleaner station 2.

[0212] The support plate cover 130 is formed to correspond to the shape of the station support plate 110. For example, the front-to-back width and left-right width of the support plate cover 130 may be the same as the front-to-back width and left-to-right width of the station support plate 110.

[0213] Meanwhile, a station through hole 131 through which the cleaner station 2 may pass may be formed in the support plate cover 130.

[0214] The width of the station through hole 131 may be narrower than the width of the station receiving groove 111. In addition, the width of the station through hole 131 may be smaller than the width of the lower surface 21a of the cleaner station 2. With this configuration, it is possible to prevent the cleaner station 2 from being separated while the cleaner station 2 is coupled to the station receiving groove 111.

[0215] A wire passage groove 132 may be formed in the support plate cover 130 through which a wire connecting power to the cleaner station 2 may pass.

[0216] The wire passage groove 132 may be formed by a portion of the support plate cover 130 being raised in an arch shape, and may accommodate wires. Accordingly, the wire may be disposed between the support plate cover 130 and the station support plate 110.

[0217] With this configuration, the wire may pass through the inner space of the connection assembly 1 and then pass through the wire passage groove 132 to be connected to the cleaner station 2. Therefore, exposure of the wire to the outside may be minimized.

[0218] A support protrusion 133 may be formed on the support plate cover 130 to guide coupling with the station support plate 110. Specifically, the support protrusion 133 protrudes downward from the lower surface of the support plate cover 130, and may be fitted with the rib formed on the station support plate 110.

[0219] With this configuration, the support plate cover 130 may be coupled to the station support plate 110 in the correct position, and a coupling force between the support plate cover 130 and the station support plate 110 may be maintained even when an impact is applied to the connection assembly 1.

[0220] Meanwhile, depending on embodiments, a plurality of hooks 134 may be formed to protrude downward on the support plate cover 130. The hook 134 may be hooked to the hook receiving groove 114 of the station support plate 110. With this configuration, a coupling force between the support plate cover 130 and the station support plate 110 may be maintained.

[0221] The charging stand coupling part 200 is disposed below the station coupling part 100, and the charging stand 4 and robot cleaner coupling plate 5 are coupled to each other.

[0222] The charging stand coupling part 200 is in contact with the ground, supports the connection assembly 1, and includes a coupling frame 210 coupled to the charging stand 4 and robot cleaner coupling plate 5.

[0223] The coupling frame 210 is disposed below the station coupling part 100 and may support the entire connection assembly 1 by contacting the ground. As an example, the coupling frame 210 may be a frame formed similar to a 'U' shape, and the lower surface of the coupling frame 210 and upper surface of the station support plate 110 may be arranged parallel to each other at a predetermined interval. With this configuration, the bal-

ance of the cleaner station 2 may be maintained in a state in which the cleaner station 2 is coupled to the connection assembly 1.

[0224] The coupling frame 210 may be in contact with at least a portion of the charging stand 4 and robot cleaner coupling plate 5. Specifically, the coupling frame 210 may be in contact with the upper surface of the bottom plate 42 of the charging stand 4 and the lower surface of the coupling plate main body 51 of the robot cleaner coupling plate 5. That is, the coupling frame 210 may cover at least a portion of the upper surface of the bottom plate 42, and the upper portion may be covered by the robot cleaner coupling plate 5. With this configuration, the coupling frame 210 may stably support the charging stand 4, and the robot cleaner coupling plate 5 may sufficiently secure a space exposed to the outside to allow easy access for the robot cleaner 6.

[0225] The charging stand receiving hole 220 is formed in the coupling frame 210 and may accommodate the charging stand 4. The charging stand receiving hole 220 may refer to a space surrounded by the coupling frame 210 and pair of connecting walls 300.

[0226] The maximum diameter of the charging stand receiving hole 220 may be larger than the maximum diameter of the charging stand housing 41. That is, the charging stand receiving hole 220 is formed so that the charging stand housing 41 may pass through. With this configuration, the charging stand housing 41 may be accommodated in the inner space of the connection assembly 1, thereby reducing the overall volume. In addition, the charging stand receiving hole 220 may be formed so that at least a portion of the bottom plate 42 may pass through. With this configuration, the charging terminal 43 may be exposed to the outside and disposed in contact with the coupling terminal of the robot cleaner 6.

[0227] The coupling plate guide groove 230 is formed in the coupling frame 210 and may guide the coupling position of the robot cleaner coupling plate 5.

[0228] The coupling plate guide groove 230 is formed at the front end of the coupling frame 210 and is coupled to the lower surface of the coupling plate main body 51. Here, the portion corresponding to the back side of the reaction force removal groove 55 among the lower surface of the coupling plate main body 51 protrudes downward corresponding to the depth at which the reaction force removal groove 55 is depressed, and this protruding portion may be accommodated in the coupling plate guide groove 230. Therefore, the coupling position of the robot cleaner coupling plate 5 may be guided by the coupling plate guide groove 230. In addition, in the process of coupling the robot cleaner 6 to the robot cleaner coupling plate 5, even if an external force is applied to the robot cleaner coupling plate 5, the robot cleaner coupling plate 5 is prevented from being separated from the connection assembly 1.

[0229] The connection wall 300 may connect the station coupling part 100 and charging stand coupling part 200. For example, the connection wall 300 may be a wall formed along a direction perpendicular to the ground to connect the station coupling part 100 and charging stand coupling part 200.

[0230] The connection wall 300 may be formed in the form of a pair of walls facing each other to be connected to both sides of the station coupling part 100 and both sides of the charging stand coupling part 200. The connection wall 300 may maintain the station coupling part 100 and charging stand coupling part 200 at a predetermined interval. With this configuration, a space surrounded by the station coupling part 100, charging stand coupling part 200, and connecting wall 300 may be formed, and the charging stand housing 41 of the charging stand 4 may be disposed in the above space.

[0231] The connecting wall 300 may support the loads of the station coupling part 100 and cleaner station 2.

[0232] The wire organizer 400 is disposed between a pair of connection walls 300 and below the station coupling part 100, and may be provided to be capable of winding the wires. The wire organizer 400 protrudes rearward from the wall connecting the pair of connecting walls 300. The wire organizer 400 may be provided so that wires may be wound and an outlet may be mounted.

[0233] With this configuration, the wires connected to the cleaner station 2 and the wires connected to the charging stand 4 may be wound and organized. In addition, by housing the outlet within the connection assembly 1, the number of wires exposed to the outside may be minimized.

[0234] FIGS. 15 to 19 are diagrams for explaining a state in which a charging stand is coupled to a connection assembly for a cleaner system according to an embodiment of the present disclosure.

[0235] Referring to FIGS. 15 to 19, a process of coupling the charging stand, robot cleaner coupling plate, and cleaner station to the connection assembly for the cleaner system according to an embodiment of the present disclosure will be described as follows.

[0236] First, in a state in which the connection assembly 1 is placed on the ground, the connection assembly 1 is lifted to expose the charging stand receiving hole 220 disposed on the lower side of the connection assembly 1. Then, the charging stand housing 41 of the charging stand 4 is inserted into the charging stand receiving hole 220. Here, the charging stand housing 41 may pass through the charging stand receiving hole 220, and the upper end of the charging stand housing 41 is coupled to and received in the charging stand guide groove 113 formed on the station support plate 110. In addition, the charging terminal 43 disposed on the upper surface of the bottom plate 42 may pass through the charging stand receiving hole 220 and be exposed above the coupling frame 210 (see FIG. 15).

[0237] Then, the connection assembly 1 to which the charging stand 4 is coupled is placed on the ground, and the robot cleaner coupling plate 5 is coupled to the upper side of the coupling frame 210. Here, the charging ter-

minal 43 is coupled so that it passes through the terminal through hole 53 of the robot cleaner coupling plate 5 and is exposed to the outside. In addition, the bottom plate 42 of the charging stand 4 and the corresponding surface 52 of the robot cleaner coupling plate 5 are coupled to face each other, and the reaction force removal groove 55 of the robot cleaner coupling plate 5 is aligned and coupled with the coupling plate guide groove 230 (see FIG. 16).

[0238] Then, the cleaner station 2 is coupled onto the station support plate 110 of the connection assembly 1. Specifically, the lower surface 21a of the cleaner station 2 is coupled to the station receiving groove 111 of the station support plate 110 (see FIG. 17).

[0239] Then, the support frame 120 is coupled to the frame receiving groove 112 of the station support plate 110. Here, the coupling rib 122 is fitted and coupled to the frame receiving groove 112, and the frame main body 121 is disposed to cover the upper portion of the lower surface 21a of the cleaner station 2. In this state, the support frame 120 and station support plate 110 are coupled by turning the screw into the fastening hole 123 of the support frame 120. Accordingly, the cleaner station 2 is fixedly coupled to the connection assembly 1 (see FIG. 18).

[0240] Then, the support plate cover 130 is coupled to the station support plate 110. The support plate cover 130 covers the lower surface 21a of the cleaner station 2, station support plate 110, and support frame 120. Here, the support plate cover 130 and station support plate 110 are hook-coupled to each other.

[0241] Meanwhile, before combining the support plate cover 130 and station support plate 110, the wire may be placed on the station support plate 110 and the wire may be accommodated in the wire passage groove 132 while covering the support plate cover 130.

[0242] Meanwhile, wires may be wound around the wire organizer 400, or outlets may be mounted on the wire organizer 400. Therefore, the wires may be wound and organized.

[0243] Meanwhile, FIG. 20 is a perspective view for explaining a cleaner system according to another embodiment of the present disclosure, FIG. 21 is a side view for explaining a connection assembly for a cleaner system according to another embodiment of the present disclosure, and FIG. 22 is a block diagram for explaining a connection relationship of power in a cleaner system according to another embodiment of the present disclosure.

[0244] In order to avoid repetitive explanation, the configuration and effect of the this embodiment are the same as those of the cleaner system according to an embodiment of the present disclosure, except for content specifically described in this embodiment, and thus, the contents described for an embodiment of the present disclosure may be used.

[0245] In the cleaner system according to this embodiment, a connection assembly 1' includes a connection wall 1300. Here, the connection wall 1300 may connect a station coupling part 1100 and a charging stand coupling part 1200. For example, the connection wall 1300 may be a wall formed along a direction perpendicular to the ground to connect the station coupling part 1100 and the charging stand coupling part 1200.

[0246] The connection wall 1300 may be formed in the form of a pair of walls facing each other to be connected to both sides of the station coupling part 1100 and both sides of the charging stand coupling part 1200. The connection wall 1300 may maintain the station coupling part 1100 and the charging stand coupling part 1200 at a predetermined interval. With this configuration, a space surrounded by the station coupling part 1100, charging stand coupling part 1200, and the connecting wall 1300 may be formed, and the charging stand housing 41 of the charging stand 4 may be disposed in the space.

[0247] The connecting wall 1300 may support the loads of the station coupling part 1100, cleaner station 2, and cleaner 3.

[0248] Specifically, the loads of the cleaner station 2 and cleaner 3 press the station coupling part 1100, and the load applied to the station coupling part 1100 is transmitted back to the connection wall 1300. Therefore, the pair of connecting walls 1300 disposed along the direction perpendicular to the ground may support the overall load of the station coupling part 1100, cleaner station 2, and cleaner 3 disposed vertically above the connecting wall 1300.

[0249] Meanwhile, in this embodiment, the connection assembly 1' may further include a support wall 1310. The support wall 1310 may connect the station coupling part 1100 and charging stand coupling part 1200 together with the connecting wall 1300. For example, the connection wall 1300 may be a wall formed along a direction perpendicular to the ground to connect the connecting wall 1300, station coupling part 1100, and charging stand coupling part 1200. That is, the support wall 1310 may refer to a wall extending forward from the connection wall 1300.

[0250] With this configuration, in the connection assembly 1' of the present embodiment, a length of the wall connecting the station coupling part 1100 and charging stand coupling part 1200 is increased compared to the connection assembly 1 according to an embodiment of the present disclosure.

[0251] In the connection assembly 1 according to an embodiment of the present disclosure, although the cleaner 3 is disposed on the front upper side of the station coupling part 100, the connecting wall 300 is disposed on the rear lower side of the station coupling part 100. Therefore, there is a limit to sufficiently supporting the cleaner 3 and cleaner station 2 to tilt forward due to the load of the cleaner 3.

[0252] In contrast, in this embodiment, the support wall 1310 is additionally disposed on the front lower side of the station coupling part 1100 to support the load of the cleaner 3, and at the same time, the support wall 1310 may evenly distribute and support the entire load of the

station coupling part 1100, cleaner station 2, and cleaner 3.

[0253] Therefore, in the present embodiment, a support wall 1310 that extends the connection wall 1300 forward and supports the front lower side of the station coupling part 1100 is further provided, thereby stably stabilizing the cleaner station 2 and cleaner 3.

[0254] Meanwhile, in this embodiment, both sides of the charging stand 4 are blocked by the connection wall 1300 as well as the support wall 1310. Accordingly, a signal (e.g., an IR signal) transmitted from the charging stand 4 may be blocked by the connection wall 1300 and support wall 1310.

[0255] In particular, in this embodiment, the length that blocks the side of the charging stand 4 is increased by the support wall 1310, so the signal transmitted from the charging stand 4 cannot spread to the side of the connection assembly 1'. As a result, there is a possibility that the robot cleaner 6 may not detect the position of the charging stand 4, and there is a possibility that the robot cleaner 6 may not be coupled to the correct position of the charging stand 4.

[0256] To solve this problem, the connection assembly 1' according to this embodiment further includes a signal passage hole 1320. A plurality of signal passage holes 1320 may be formed in the support wall 1310.

[0257] With this configuration, the signal transmitted from the charging stand 4 may be transmitted to the outside of the connection assembly 1' through the signal passage hole 1320. Accordingly, the robot cleaner 6 may detect the position of the charging stand 4, and the robot cleaner 6 may be coupled at the correct position. In addition, the robot cleaner 6 may be controlled by transmitting a control signal from the charging stand 4 to the robot cleaner 6.

[0258] Meanwhile, as illustrated in FIG. 22, in the cleaner system according to this embodiment, the charging stand 4 may be electrically connected to the cleaner station 2. In addition, the cleaner station 2 may be electrically connected to a power source P that supplies electricity.

[0259] Although not illustrated, a power line (terminal) that supplies current to the charging stand 4 may be connected to the cleaner station 2. Accordingly, the charging stand 4 may be electrically connected to a controller (not illustrated) that controls the cleaner station 2. Here, the controller may include a printed circuit board and elements mounted on the printed circuit board.

[0260] Therefore, according to the present disclosure, the charging stand 4 may receive current through the cleaner station 2. That is, in this embodiment, one power line may be connected to the power source P to supply current to both the cleaner station 2 and the charging stand 4.

[0261] Hereinabove, the present disclosure has been described in detail through a specific implementation, but this is for specifically illustrating the present disclosure, and the present disclosure is not limited thereto. It is clear that the present disclosure can be modified or improved by a person having ordinary knowledge in the field within the technical spirit of the present disclosure.

[0262] All simple modifications or changes of the present disclosure fall within the scope of the present disclosure, and the specific protection scope of the present disclosure will be clarified by the appended claims.

Claims

1. A connection assembly for a cleaner system, comprising:

   a station coupling part that supports and is coupled to a lower side of a cleaner station that suctions and collects dust inside a dust container of a cleaner; and
   a charging stand coupling part that is disposed on a lower side of the station coupling part and to which a robot cleaner coupling plate and a charging stand are coupled, wherein a robot cleaner is coupled to the robot cleaner coupling plate and the charging stand supplies power to the robot cleaner.

2. The connection assembly of claim 1, wherein the station coupling part includes:

   a station support plate that is disposed to face a lower surface of the cleaner station and in contact with the lower surface of the cleaner station; and
   a support plate cover that is coupled to an upper side of the station support plate and covers at least a portion of the lower surface of the cleaner station.

3. The connection assembly of claim 2, wherein the station coupling part further includes a support frame that is coupled between the station support plate and the support plate cover and supports the lower surface of the cleaner station.

4. The connection assembly of claim 1, wherein the robot cleaner coupling part includes:

   a coupling frame that is disposed on a lower side of the station coupling part and disposed in parallel with the station coupling part at a predetermined interval; and
   a charging stand receiving hole that is formed in the coupling frame and accommodates the charging stand that supplies power to the robot cleaner.

5. The connection assembly of claim 1, further com-

prising:
a pair of connection walls that connect the station coupling part and the charging stand coupling part.

6. The connection assembly of claim 4, wherein an upper portion of the coupling frame is covered by the robot cleaner coupling plate.

7. The connection assembly of claim 5, further comprising a wire organizer that is disposed between the pair of connection walls, disposed below the station support plate, and capable of winding a wire.

8. The connection assembly of claim 2, wherein a station through hole through which the cleaner station passes is formed in the support plate cover, and a maximum diameter of the station through hole is smaller than a minimum diameter of the lower surface of the cleaner station.

9. The connection assembly of claim 2, wherein a station receiving groove in which the lower surface of the cleaner station is accommodated is formed in the station support plate, and in a state in which the support cover is coupled to the station support plate, at least a portion of the support plate cover covers a vertical upper portion of the station receiving groove.

10. The connection assembly of claim 2, wherein the station support plate includes:

a station receiving groove in which the lower surface of the cleaner station is accommodated; and
a frame receiving groove that is formed to surround an outside of the station receiving groove and receives the support frame.

11. The connection assembly of claim 10, wherein the support frame includes:

a frame main body that is formed to cover an upper portion of the lower surface of the cleaner station; and
a coupling rib that protrudes and extends downward from the frame main body and is coupled to the frame receiving groove.

12. The connection assembly of claim 2, wherein the station coupling part includes a wire passage groove that is formed by protruding from the support plate cover in an arch shape and through which a wire passes.

13. The connection assembly of claim 5, further comprising a support wall that extends from the connection wall and supports the station coupling part.

14. The connection assembly of claim 13, further comprising a plurality of signal passage holes formed in the support wall to allow a signal to pass through

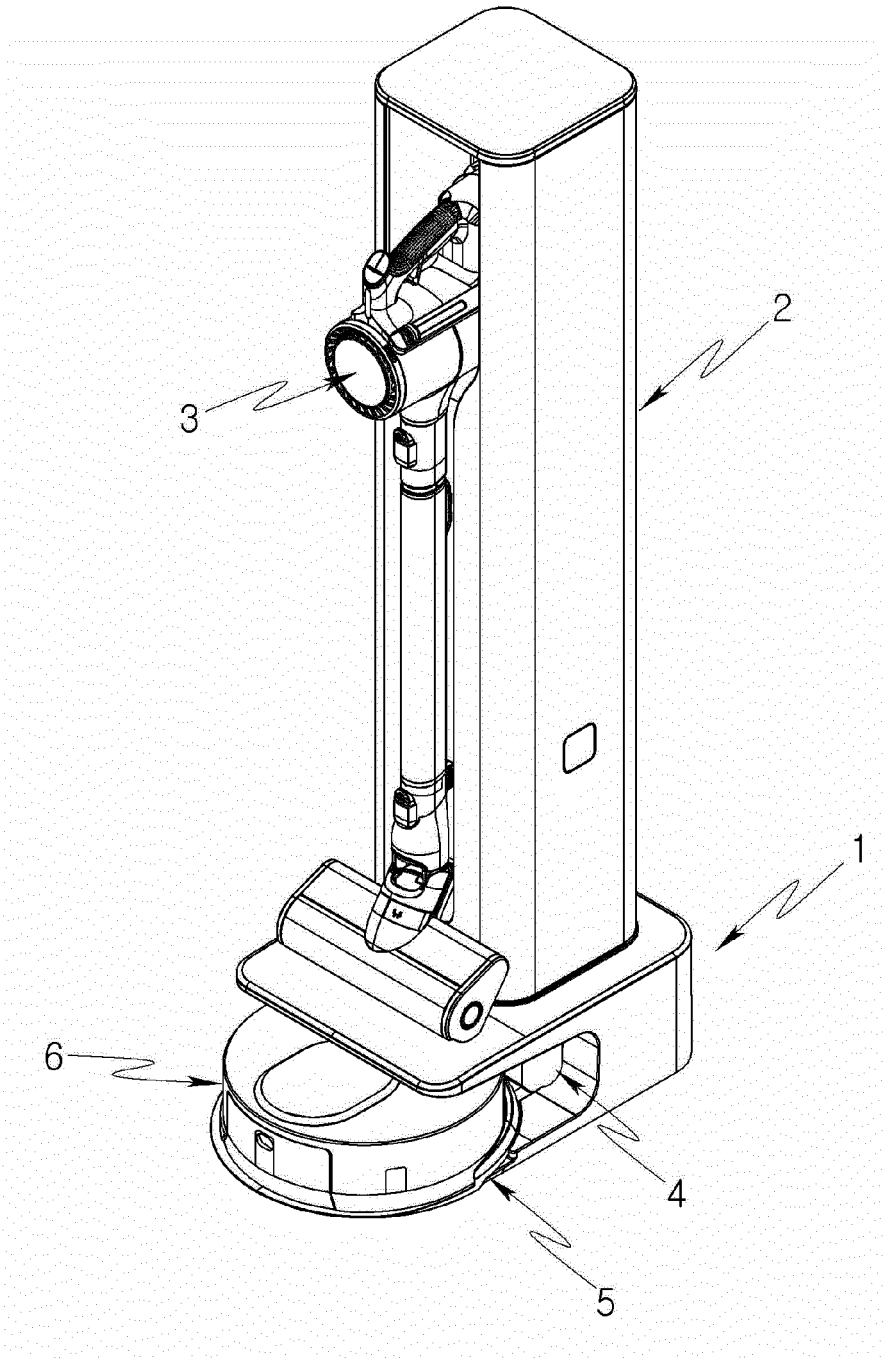
15. A cleaner system, comprising:

a cleaner that includes a suction part with a suction passage through which air is able to flow, a dust separating part having at least one cyclone part, and a dust bin that stores dust separated through the dust separating part;
a cleaner station that includes a coupling part to which the dust bin is coupled, a dust collecting part that collects dust inside the dust bin, a dust collecting motor that generates a suction force to suck the dust inside the dust bin into the dust collecting part, and a housing that includes the dust collecting part and the dust collecting motor therein along a longitudinal direction;
a robot cleaner that includes a battery and a motor inside and moves along a floor surface to clean the floor surface;
a charging stand that supplies power to the robot cleaner;
a robot cleaner coupling plate on which the robot cleaner is coupled at an upper portion thereof and through which a charging terminal of the charging stand passes; and
a connection assembly that is coupled to a lower side of the cleaner station, accommodates the charging stand therein, and is coupled to the robot cleaner coupling plate.

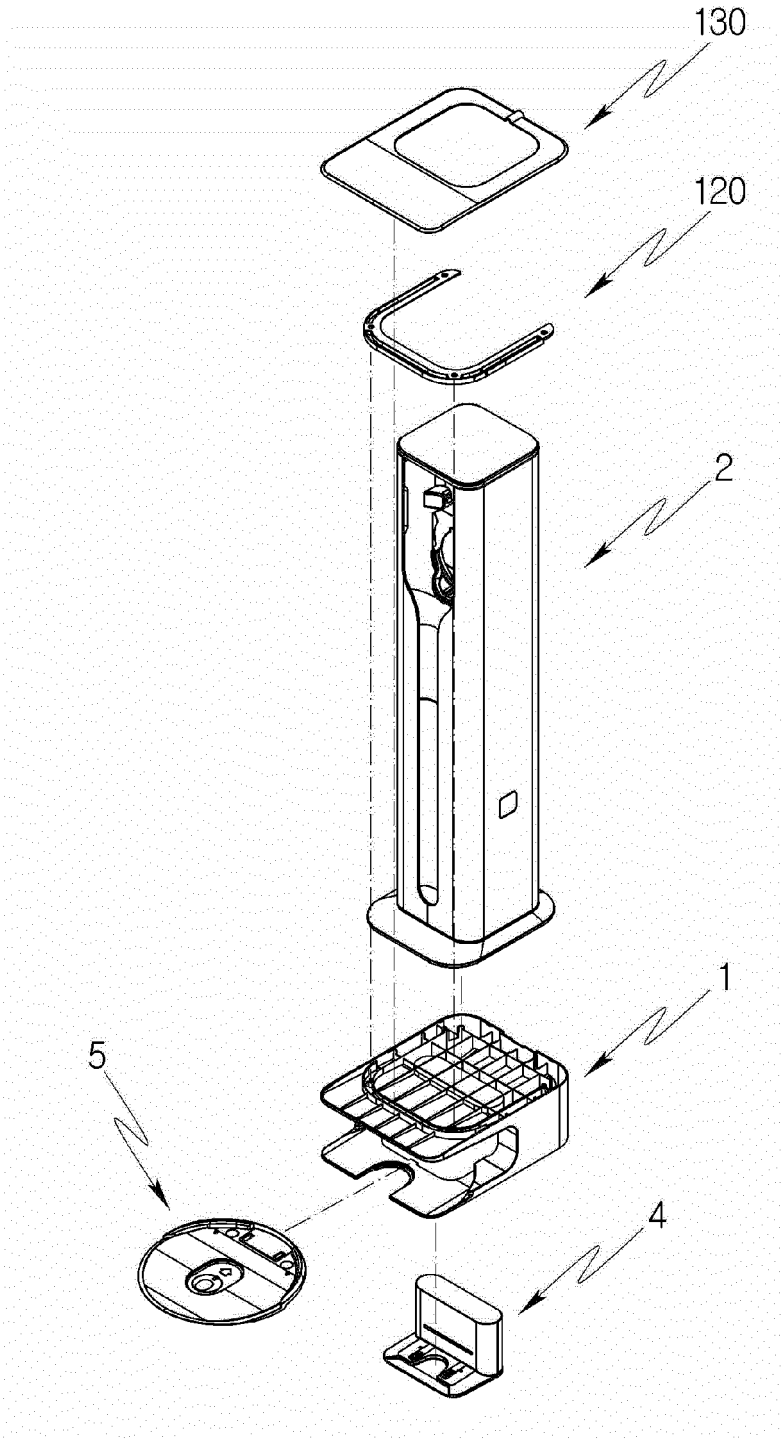
16. The cleaner system of claim 15, wherein the charging stand is disposed below the cleaner station, and the robot cleaner is disposed below the cleaner.

17. The cleaner system of claim 15, wherein the charging stand is electrically connected to the cleaner station and receives current through the cleaner station.

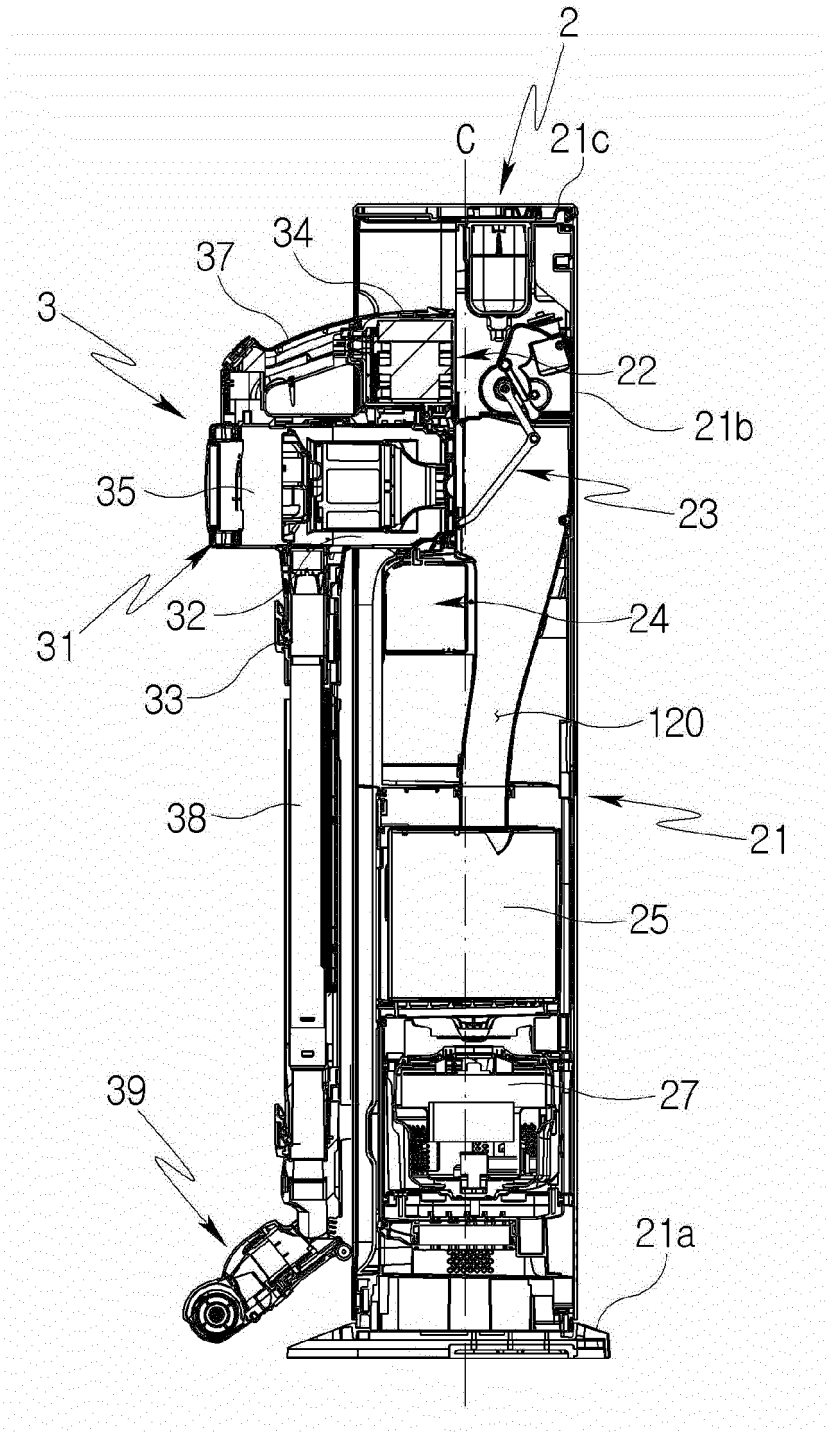
[FIG. 1]



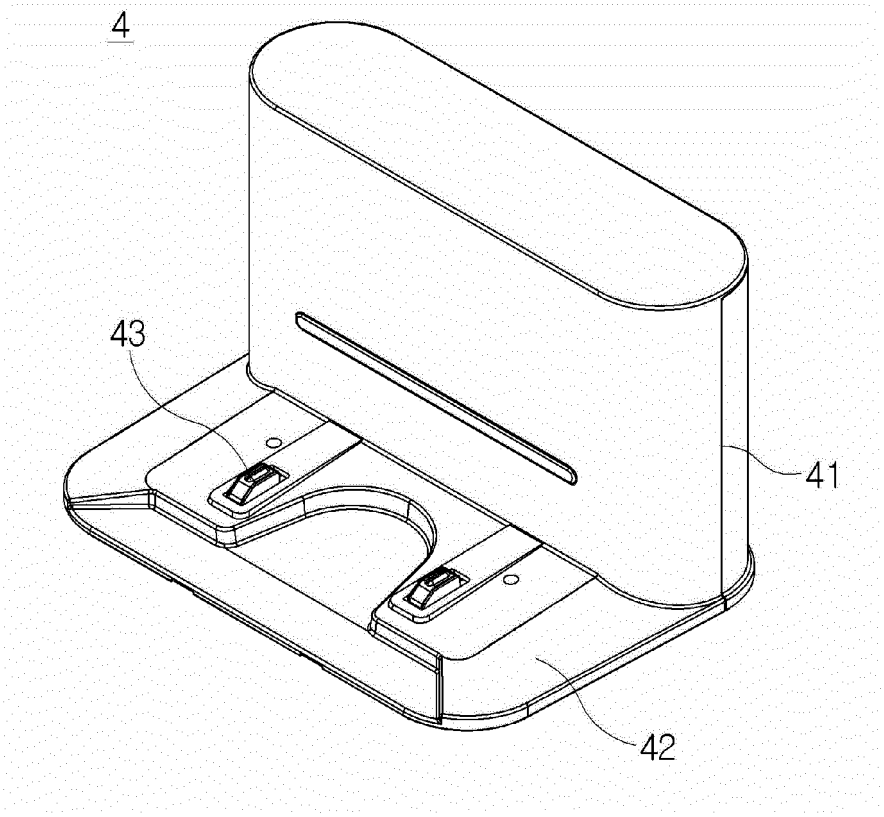
[FIG. 2]



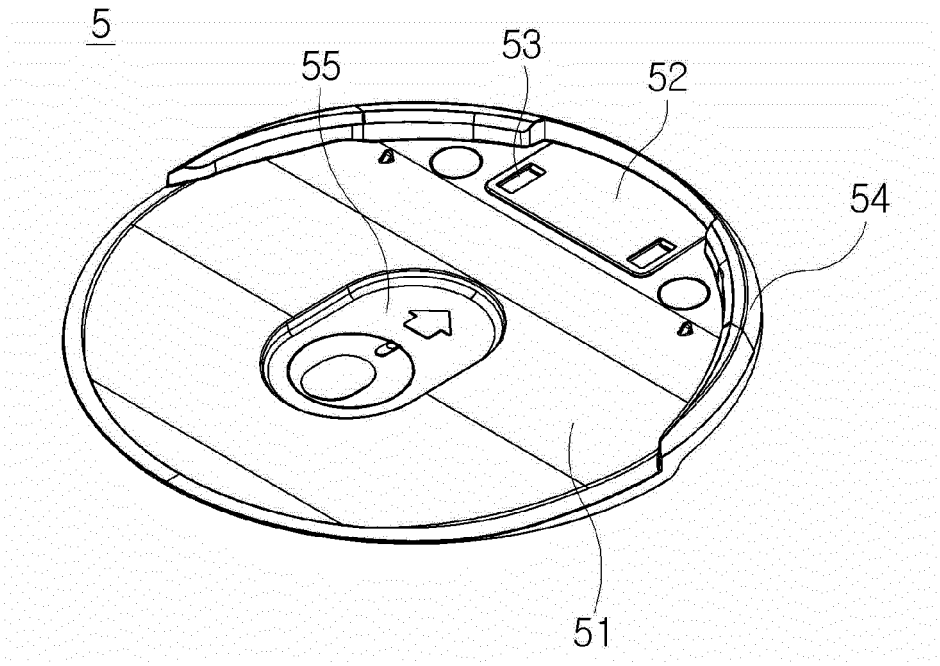
[FIG. 3]



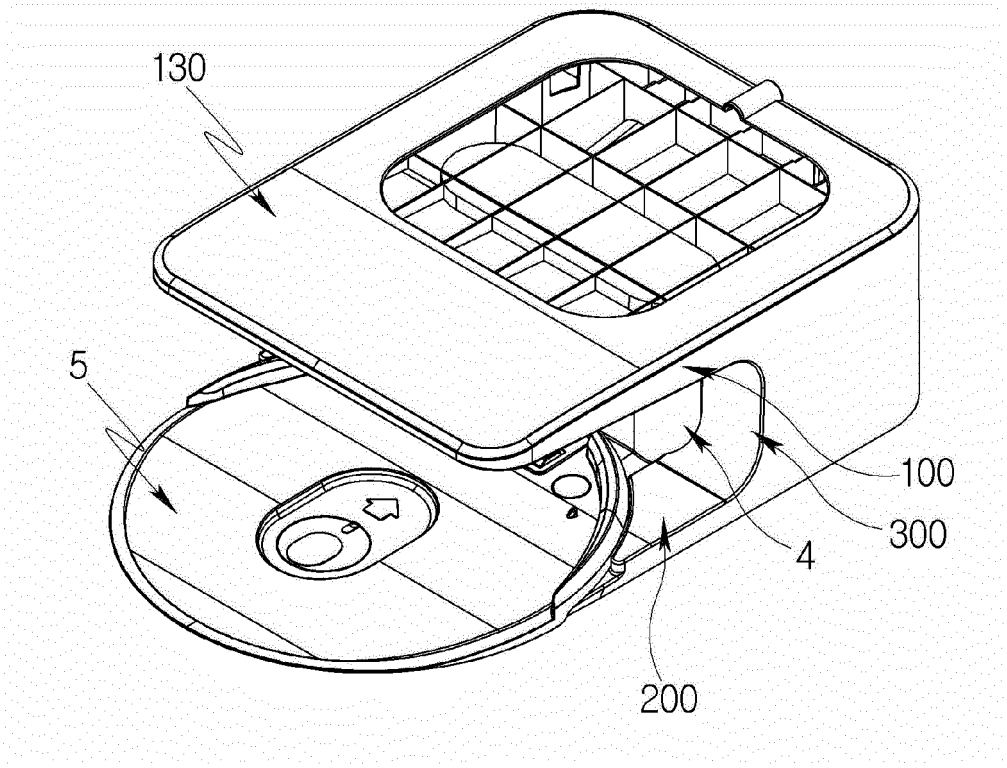
[FIG. 4]



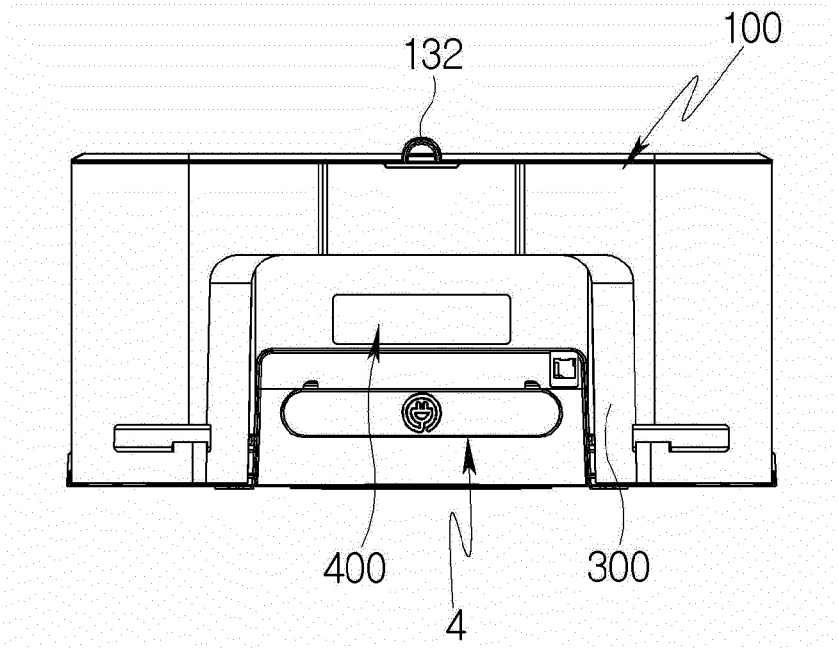
[FIG. 5]



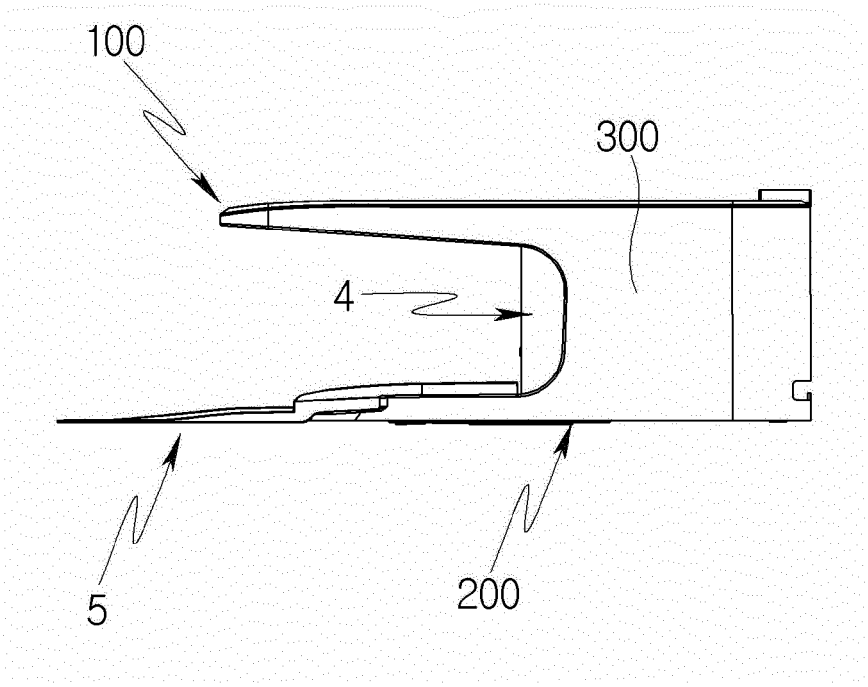
[FIG. 6]



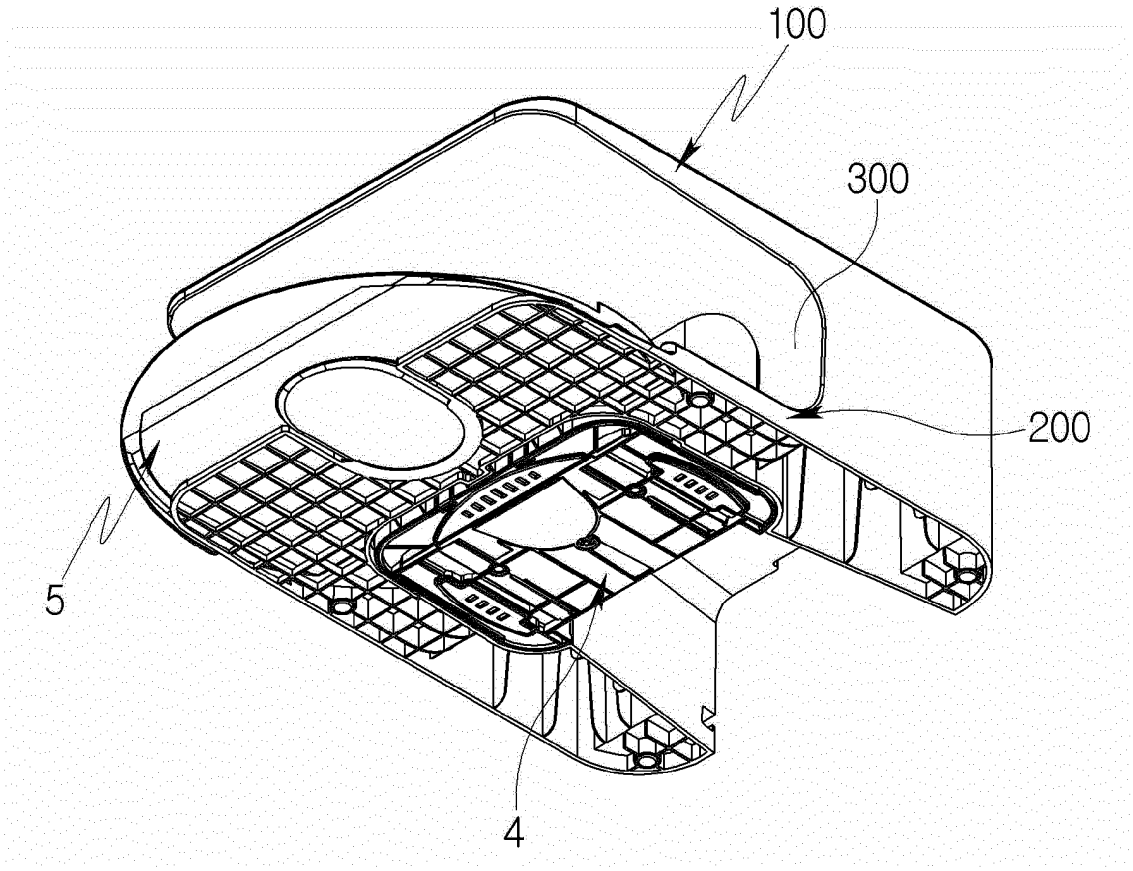
[FIG. 7]



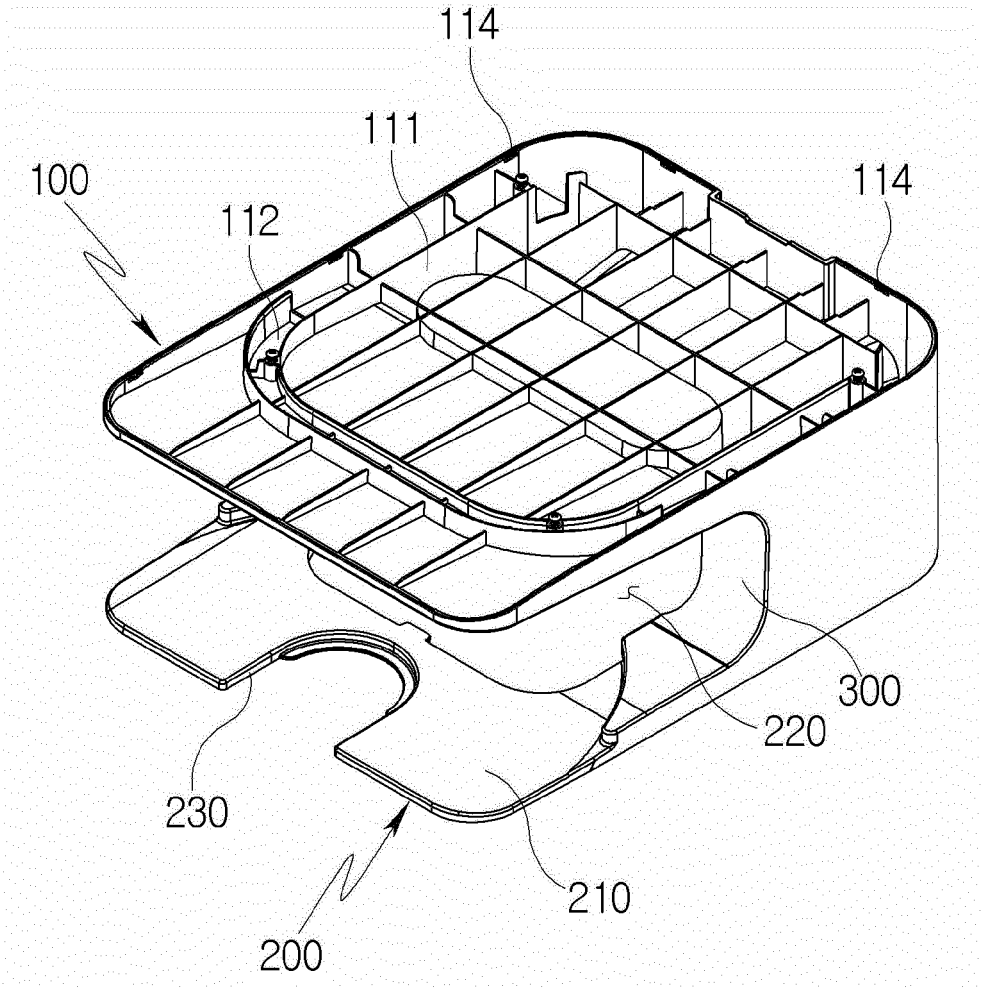
[FIG. 8]



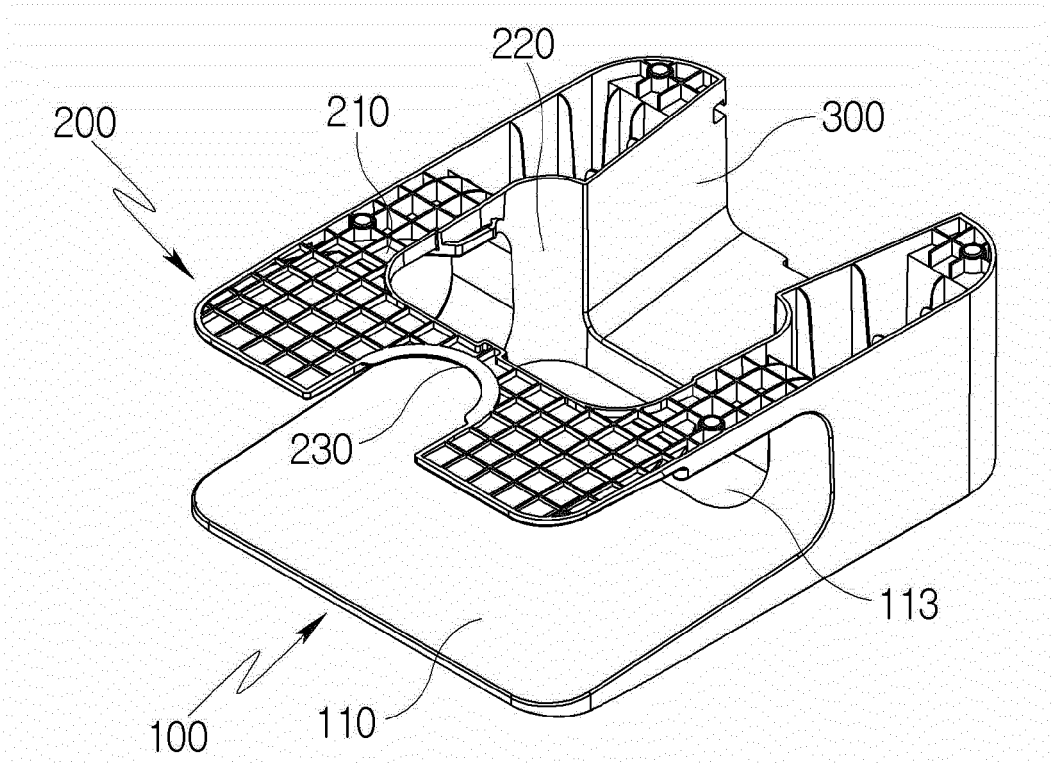
[FIG. 9]



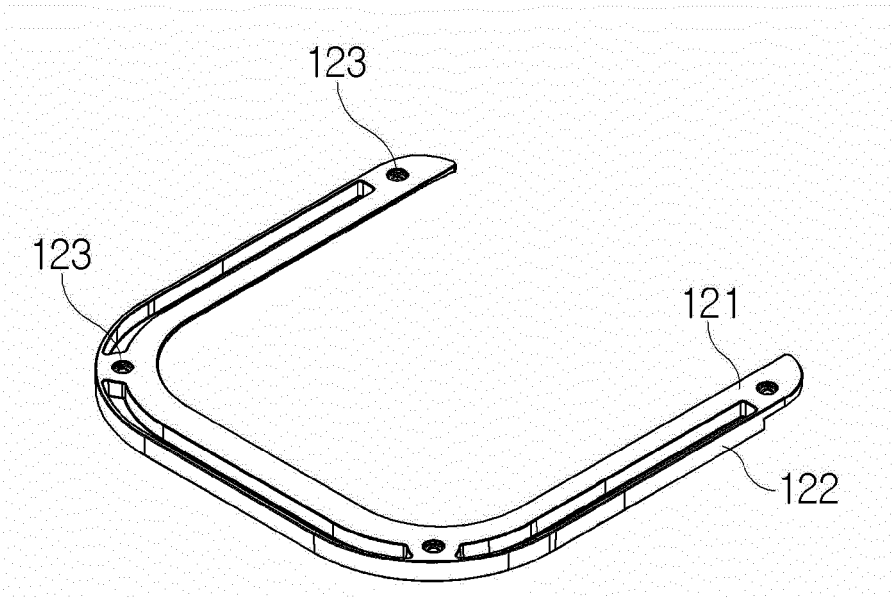
[FIG. 10]



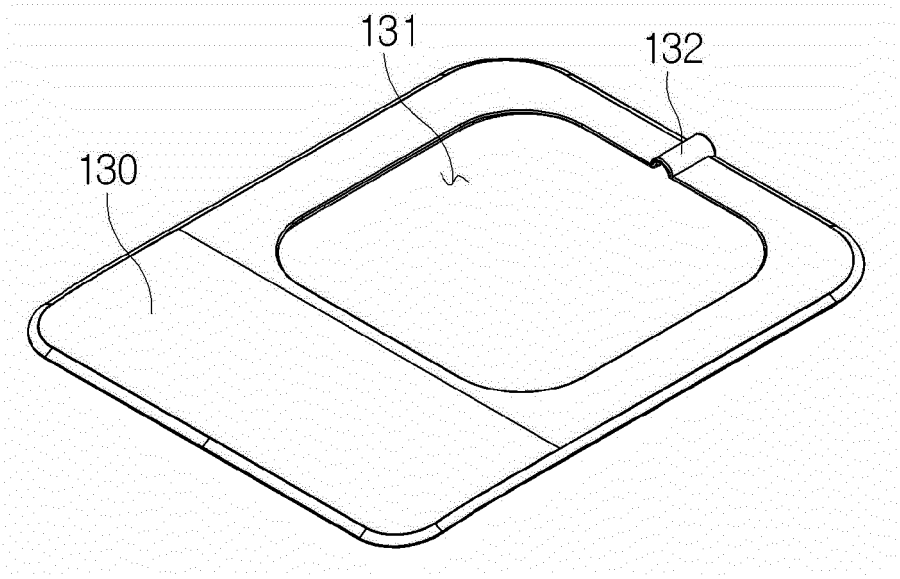
[FIG. 11]



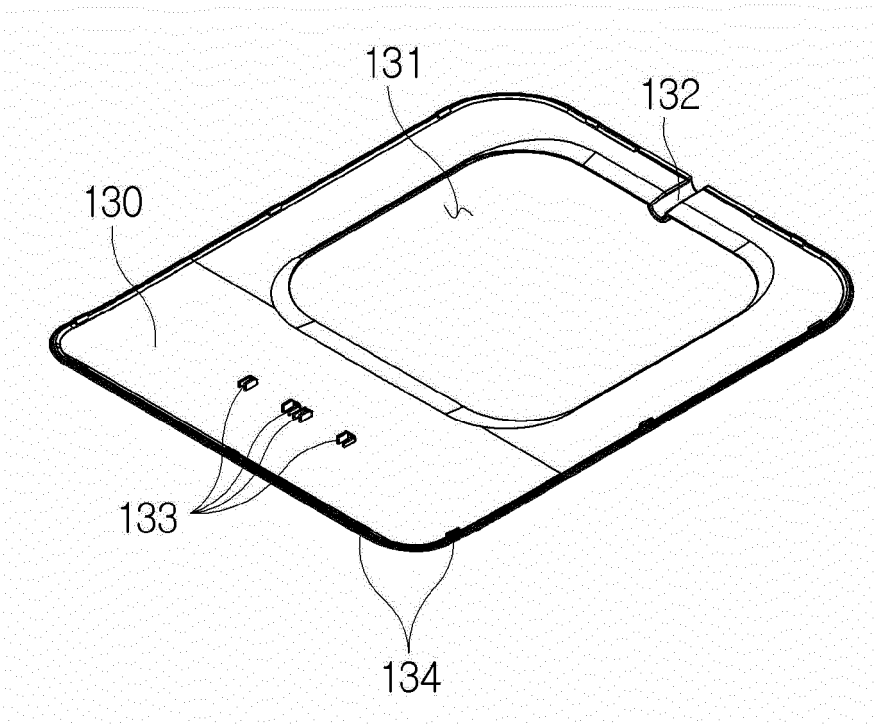
[FIG. 12]



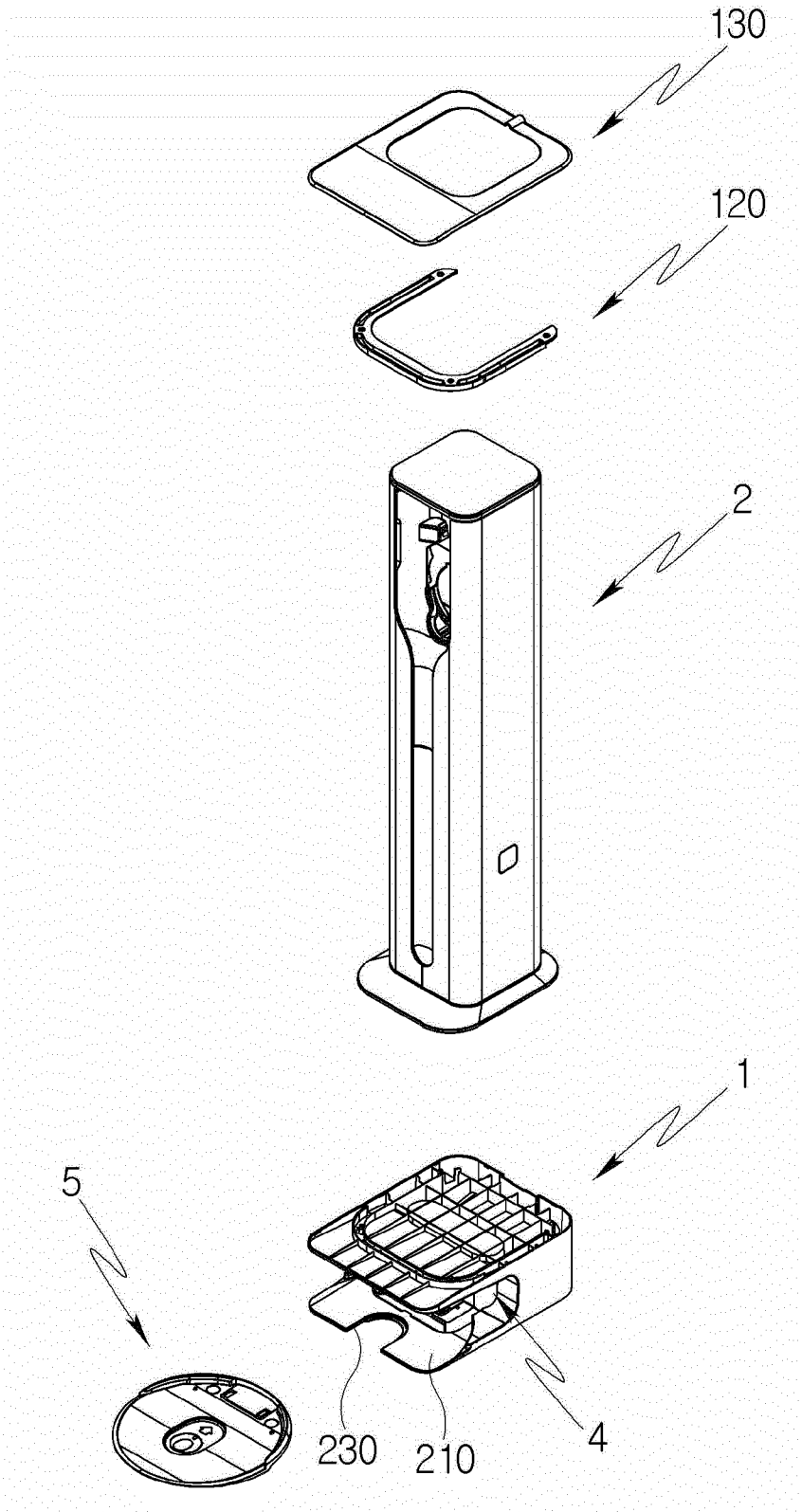
[FIG. 13]



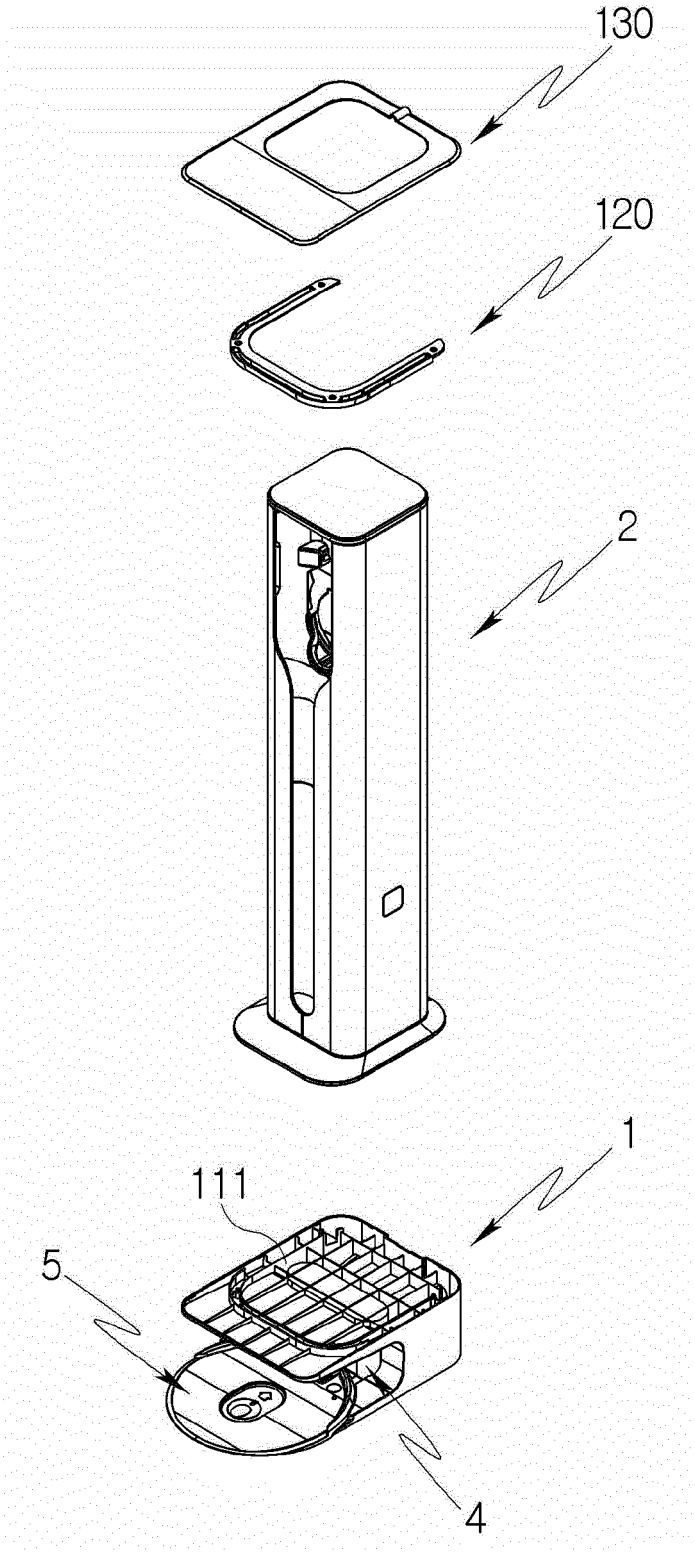
[FIG. 14]



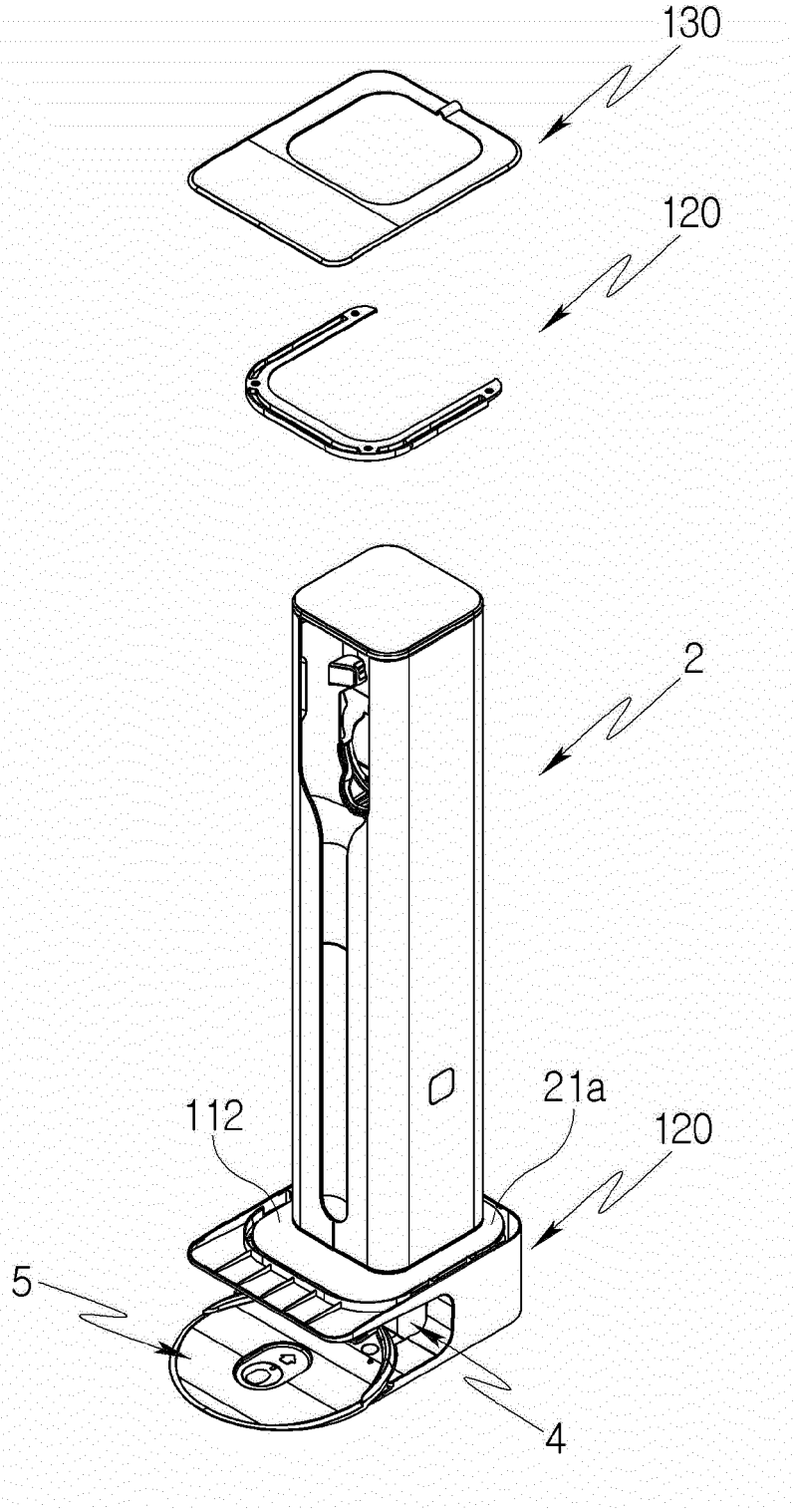
[FIG. 15]



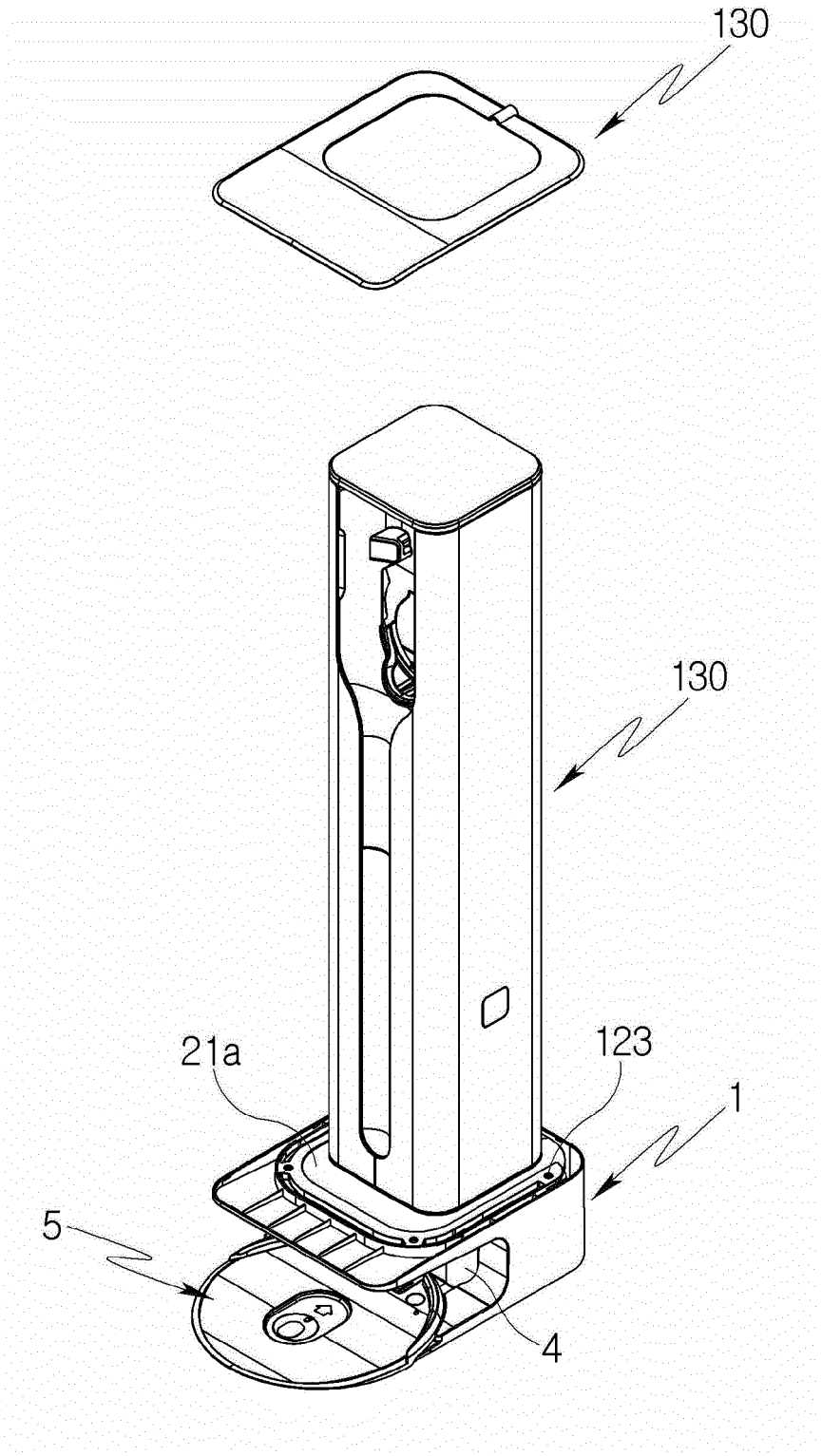
[FIG. 16]



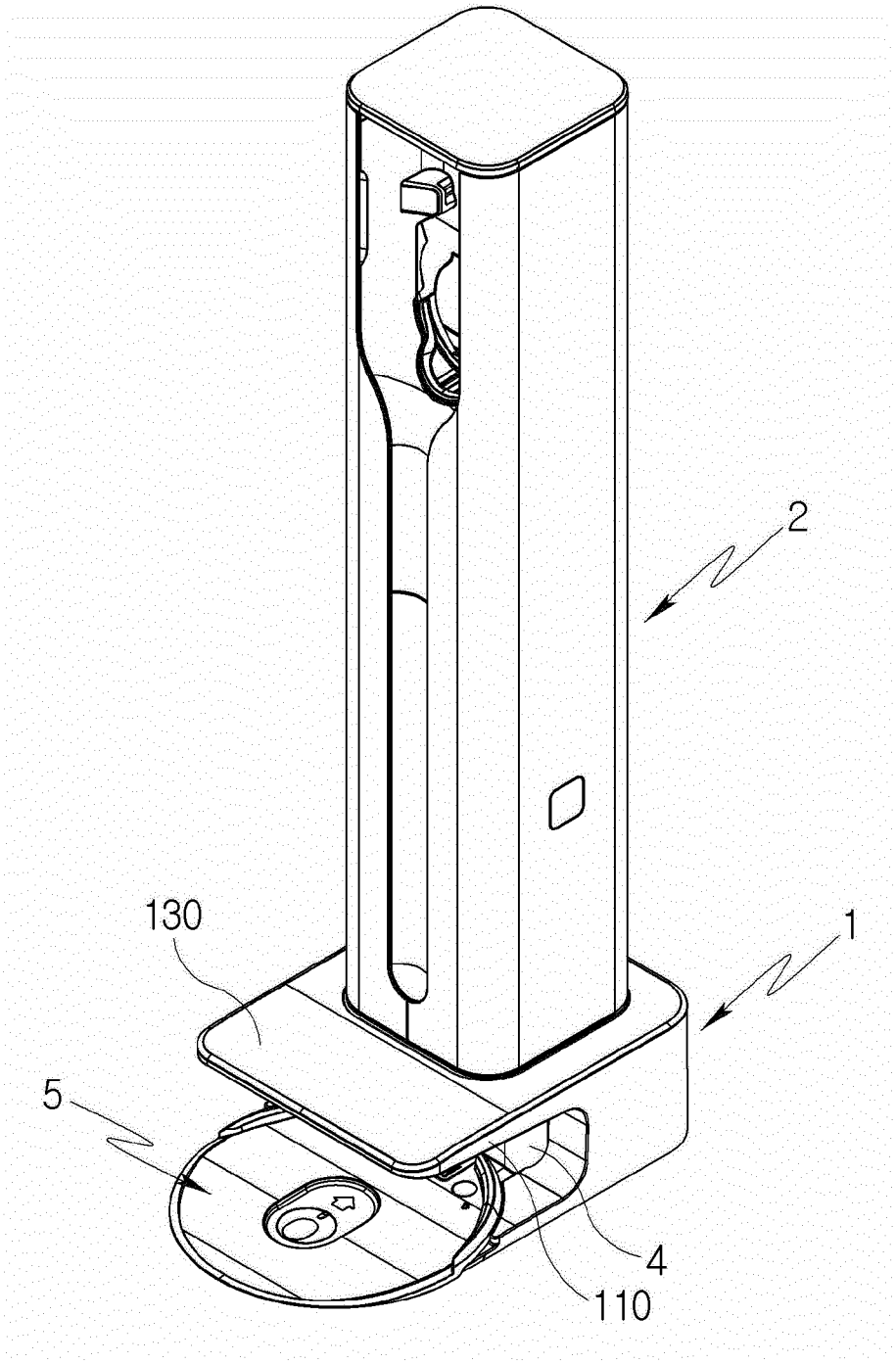
[FIG. 17]



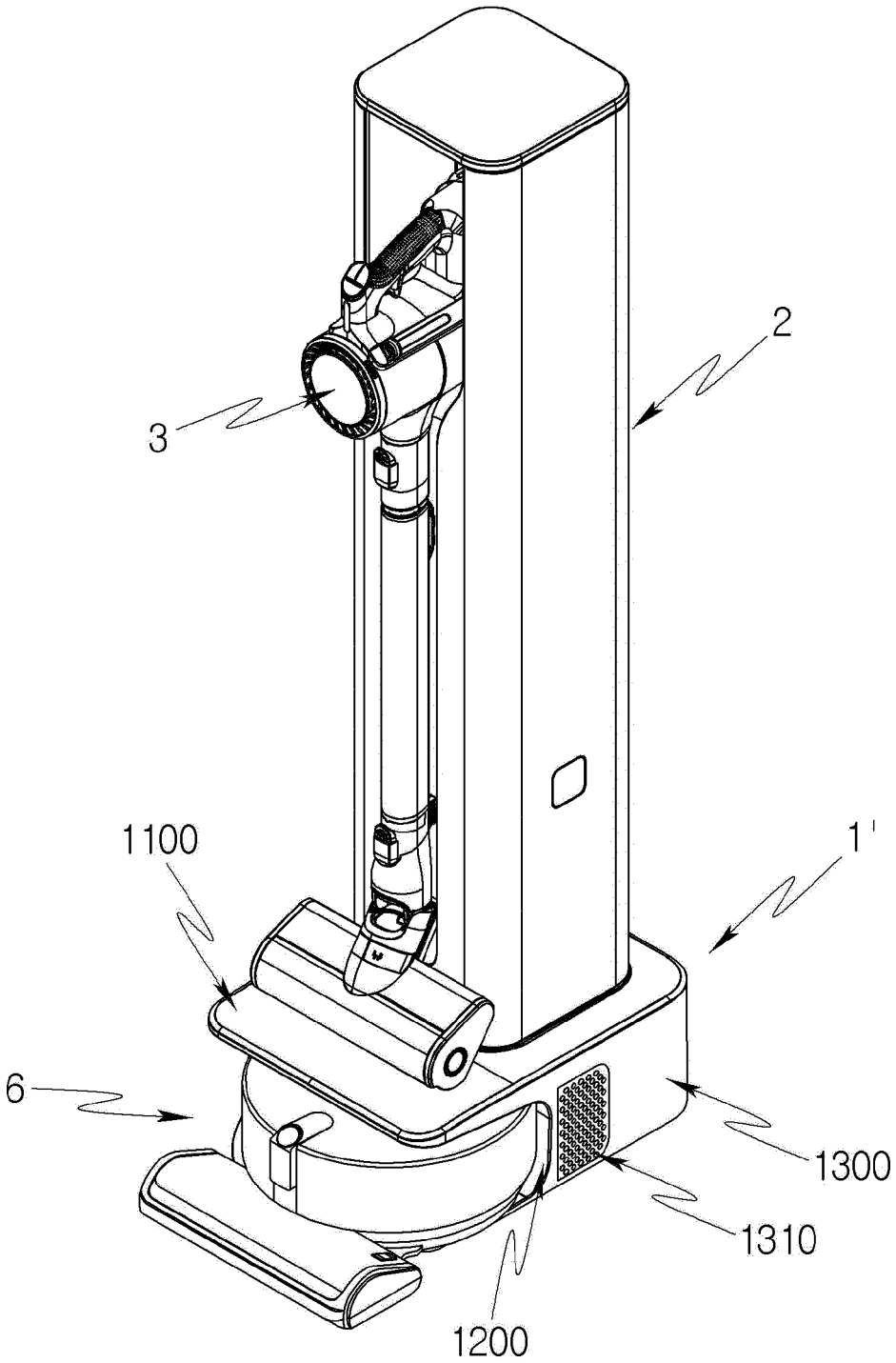
[FIG. 18]



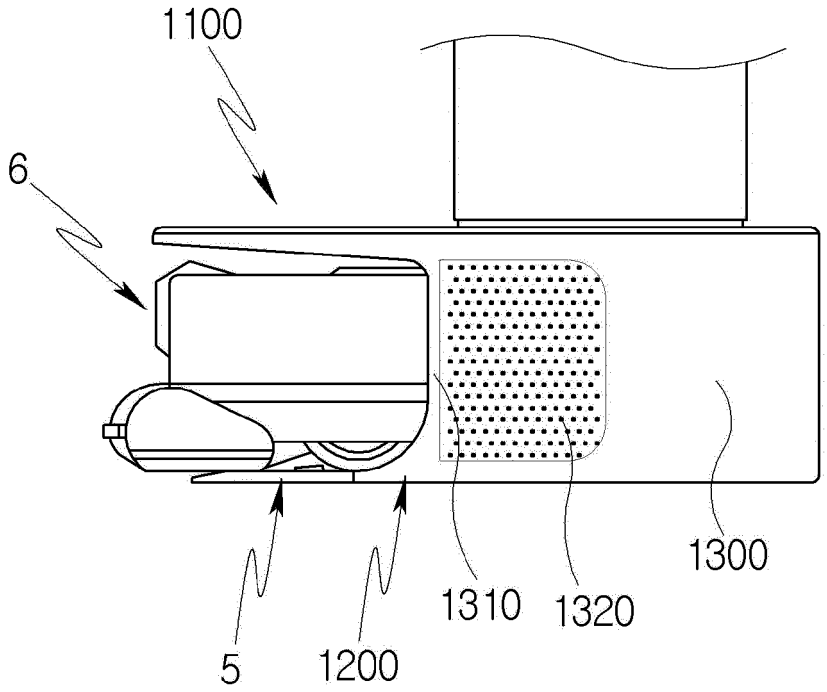
[FIG. 19]



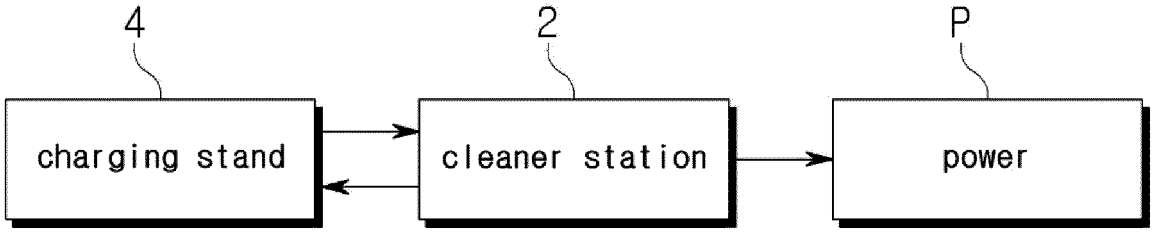
[FIG. 20]



[FIG. 21]


1100
6
1300
1310
1320
5
1200

[FIG. 22]


4
2
P
charging stand
cleaner station
power

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2022/021470

A. CLASSIFICATION OF SUBJECT MATTER

A47L 9/28(2006.01)i; **A47L 9/00**(2006.01)i; **A47L 9/26**(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 11/40(2006.01); A47L 5/24(2006.01); A47L 9/00(2006.01); F24F 3/16(2006.01); H02J 50/00(2016.01)

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: 핸드청소기(hand cleaner), 로봇청소기(robot cleaner), 스테이션(station), 충전(charge), 결합부(joint), 커버(cover), 프레임(frame), 선정리부(line organization)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2021-0130655 A (LG ELECTRONICS INC.) 01 November 2021 (2021-11-01) See paragraphs [0057]-[0061] and [0140]-[0175] and figures 1-15.	1-6,9,13-17
A		7-8,10-12
Y	KR 10-2021-0110427 A (KOREA AIR CONDITIONING E.N.G CO., LTD.) 08 September 2021 (2021-09-08) See paragraphs [0042]-[0071], claim 1 and figures 1-5.	1-6,9,13-17
A	JP 2020-185379 A (VORWERK & CO. INTERHOLDING GMBH) 19 November 2020 (2020-11-19) See paragraphs [0034]-[0055] and figures 1-2.	1-17
A	CN 113662483 A (GUANGDONG WONJAR INTELLIGENT ROBOT CO., LTD.) 19 November 2021 (2021-11-19) See claim 1 and figures 1-3.	1-17

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

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

Date of the actual completion of the international search	Date of mailing of the international search report
29 March 2023	**30 March 2023**
Name and mailing address of the ISA/KR **Korean Intellectual Property Office** **Government Complex-Daejeon Building 4, 189 Cheongsa-ro, Seo-gu, Daejeon 35208** Facsimile No. **+82-42-481-8578**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2022/021470

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-2021-0130461 A (LG ELECTRONICS INC.) 01 November 2021 (2021-11-01) See paragraphs [0044]-[0098] and figures 1-5.	1-17

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2022/021470

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
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