



(11)

EP 4 772 100 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:
08.07.2026 Bulletin 2026/28

(21) Application number: **24863284.6**

(22) Date of filing: **06.09.2024**

(51) International Patent Classification (IPC):
A47L 11/40 ^(2006.01) **F26B 21/00** ^(2026.01)
A47B 77/04 ^(2006.01) **A47L 7/00** ^(2006.01)
A47L 5/38 ^(2006.01)

(52) Cooperative Patent Classification (CPC):
A47B 77/04; A47L 5/38; A47L 7/00; A47L 11/40;
F26B 21/00

(86) International application number:
PCT/KR2024/013561

(87) International publication number:
WO 2025/053705 (13.03.2025 Gazette 2025/11)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(30) Priority: **08.09.2023 KR 20230119851**
02.02.2024 KR 20240016868
12.08.2024 KR 20240107505

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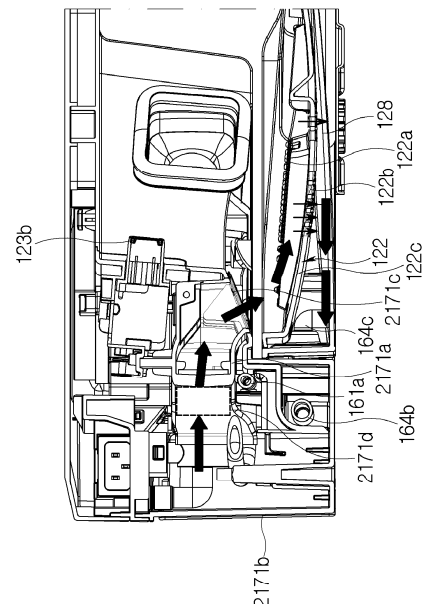
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(54) **STATION FOR ROBOT CLEANER**

(57) A station for a robot cleaner, in which a flow guide surface is formed on a washing plate and a passage hole is formed in the flow guide surface, so that heated air passing through the washing plate is introduced into a washing tub to remove moisture remaining in the washing tub.

[FIG. 29]



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Description

[Technical Field]

[0001] Embodiments of the present invention relate to a station for a robot cleaner, and more particularly, to a built-in station for a robot cleaner configured to, when the robot cleaner is docked therewith, collect dust from a dust bin of the robot cleaner, wash a mop of the robot cleaner, and dry the mop.

[Background Art]

[0002] With the recent development of industrial technology, robot cleaners have been developed to travel and clean a target area autonomously without a user's manipulation.

[0003] Such a robot cleaner may include a sensor capable of recognizing a space to be cleaned, an agitator for sweeping a floor surface, and a mop for wiping the floor surface. The robot cleaner may travel while suctioning dust from the floor surface of the space recognized by the sensor and wiping the floor surface with the mop or the like.

[0004] Among robot cleaners, there are dry-type robot cleaners capable of removing foreign substances scattered on a floor surface by suctioning the same, and wet-type robot cleaners capable of wiping the floor surface with a wet mop to effectively remove foreign substances adhered to the floor surface. A dry-type robot cleaner includes a dust bin and suctions foreign substances on a floor surface using a suction force of a suction motor. A wet-type robot cleaner includes a water tank and is configured to effectively remove foreign substances adhered to a floor surface by supplying water contained in the water tank to a mop so that the mop wipes the floor surface while containing moisture. In addition, there is a type of robot cleaner provided with both an agitator and a mop.

[0005] A charging stand for a robot cleaner is a device to which a robot cleaner that has completed cleaning is docked, and which charges a battery by supplying power to the battery provided in the robot cleaner. The charging stand includes a power supply module therein. The charging stand includes a charging terminal connected to the power supply module, and the robot cleaner includes a corresponding terminal. When the charging terminal and the corresponding terminal come into contact with each other, power is supplied to the battery for charging.

[0006] Meanwhile, when the charging stand for the robot cleaner is disposed in an indoor space of a building, it occupies a certain range of the indoor space. In this case, the efficiency of the indoor space may be deteriorated. In addition, a problem may occur in which a user or a pet collides with the robot cleaner while moving, leading to injury to the user or the pet as well as damage to the robot cleaner.

[0007] Furthermore, in the case of a station to which a

dust collection function of a robot cleaner is added, there is a limitation in that the interior of the room may be marred as the volume occupied by the station increases.

[0008] In this regard, Chinese Utility Model Registration No. CN 219206761 U discloses an apparatus for washing a robot cleaner at a lower portion of a washing machine.

[0009] The aforementioned washing apparatus is capable of washing the robot cleaner by utilizing a lower space of the washing machine.

[0010] Furthermore, since the robot cleaner is washed using the water supply and drainage connected to the washing machine, a separate water supply and drainage structure is not required.

[0011] However, the aforementioned washing apparatus merely washes the robot cleaner and has a limitation in that it is not provided with a function for drying the robot cleaner.

[0012] Accordingly, the aforementioned washing apparatus can be used only when washing the robot cleaner, cannot provide basic functions such as drying, and has a limitation in that a separate module equipped with a drying function must be provided.

[0013] Meanwhile, Chinese Utility Model Registration No. CN 218922468 U discloses a station for a cleaner in which a robot cleaner is coupled to a lower side of a washing machine to perform charging and dust collection for the robot cleaner and to wash a mop of the robot cleaner.

[0014] The aforementioned cleaner station is configured to dry a mop disposed above a washing tub by supplying drying air into the washing tub for washing the mop of the robot cleaner.

[0015] However, in the case where the mop is dried in an open indoor space as in the aforementioned cleaner station, there are limitations in that indoor humidity may increase due to water vapor generated during the drying process, and odors may spread indoors as wastewater generated while washing the mop evaporates.

[0016] In addition, in the process of drying the mop in an open space, heated air is dispersed to the outside, and thus the heated air must be continuously supplied for a long period of time, which leads to a limitation of decreased energy efficiency.

[Summary of Invention]

[Technical Problem]

[0017] The present invention has been devised to improve the problems of the conventional station for a robot cleaner as described above, and an aspect of the present invention is to provide a station for a robot cleaner that can be built into a lower space of a kitchen cabinet without requiring a separate installation space.

[0018] In another aspect of the present invention, embodiments provide a station for a robot cleaner capable of accommodating a robot cleaner in a lower space of a

kitchen cabinet having a predetermined height restriction.

[0019] In yet another aspect of the present invention, embodiments provide a station for a robot cleaner capable of automatically collecting dust from a dust bin of a robot cleaner when the robot cleaner is docked therewith.

[0020] In still another aspect of the present invention, embodiments provide a station for a robot cleaner capable of automatically washing a mop of a robot cleaner when the robot cleaner is docked therewith.

[0021] In still another aspect of the present invention is to provide a station for a robot cleaner capable of automatically drying the mop after washing the mop of the robot cleaner.

[0022] In still another object of the present invention is to provide a station for a robot cleaner that allows the station to be pulled out for cleaning and repair as necessary.

[0023] Another object of the present invention is to provide a station for a robot cleaner capable of preventing dust from being scattered to the outside when dust is collected from the robot cleaner.

[0024] Another object of the present invention is to provide a station for a robot cleaner capable of preventing wastewater from leaking to the outside when a mop of the robot cleaner is washed.

[0025] In still another aspect of the present invention, embodiments provide a station for a robot cleaner capable of increasing drying efficiency during a process of drying the mop.

[0026] In still another aspect of the present invention, embodiments provide a station for a robot cleaner capable of preventing vaporized moisture from leaking into a kitchen interior during a process of drying the mop of the robot cleaner.

[Technical Solution]

[0027] To solve the above-described problems, a station for a robot cleaner according to the present invention may include: a housing disposed at a lower side of a kitchen cabinet; a seating unit disposed in the housing and configured to accommodate a robot cleaner; and a mop drying unit disposed in the housing and configured to dry a mop of the robot cleaner, wherein the seating unit may include a washing plate configured to contact the mop in a state in which the robot cleaner is coupled, the mop drying unit may include a heater configured to heat air and an external air discharge portion configured to discharge air heated by the heater, and the washing plate may include a flow guide surface formed in a curved shape to guide a flow of air discharged from the external air discharge portion.

[0028] Through this configuration, air supplied through the external air discharge portion may flow along the flow guide surface to supply heated air to the entire mop, thereby increasing drying efficiency.

[0029] In this case, the flow guide surface may be

formed with at least one passage hole through which fluid is allowed to pass. Through this configuration, heated air may pass through the passage hole and be supplied to a washing tub.

5 **[0030]** Meanwhile, the flow guide surface may be formed such that a height from a floor of the kitchen increases as the flow guide surface becomes closer to the external air discharge portion from a position where the passage hole is formed.

10 **[0031]** Meanwhile, the washing plate may further include a washing protrusion protruding from the flow guide surface so as to contact the mop, and the passage hole may be formed between the protrusions.

15 **[0032]** Further, at least a portion of the external air discharge portion may be disposed above the washing plate.

[0033] In this case, the washing protrusions may be symmetrically arranged as a pair, and a vertically lower side of the external air discharge portion may be disposed between the pair of washing protrusions.

20 **[0034]** Accordingly, air discharged from the external air discharge portion may be guided by the pair of washing protrusions and the flow guide surface and may be supplied to the washing plate and a washing tub to dry moisture remaining after washing of the mop.

25 **[0035]** Meanwhile, the seating unit may further include a washing tub disposed below the washing plate, detachably coupled with the washing plate, and configured to receive fluid passing through the washing plate.

30 **[0036]** In this case, the washing tub may include a washing tub base surface along which fluid passing through the washing plate flows, and the washing tub base surface may be formed such that a height from the floor of the kitchen decreases as the washing tub base surface becomes closer to the external air discharge portion.

35 **[0037]** Through this configuration, air supplied from the external air discharge portion may flow toward a rear side of the washing tub and may dry moisture remaining at a lower portion of the washing tub.

40 **[0038]** Meanwhile, the external air discharge portion may be formed such that a diameter in a left-right direction of an external air discharge port through which air is discharged becomes narrower as the external air discharge portion becomes closer to the passage hole.

45 **[0039]** Further, the external air discharge portion may include a grille configured to guide a discharge direction of air.

50 **[0040]** Meanwhile, the station for a robot cleaner according to the present invention may further include a mop washing unit configured to wash the mop of the robot cleaner, wherein the mop washing unit may include a wastewater inlet configured to discharge liquid that has passed through the washing plate, and the wastewater inlet may be disposed below the external air discharge portion.

55 **[0041]** In this case, at least a portion of the external air discharge portion may be disposed above the washing

plate.

[0042] Further, the wastewater inlet may be disposed below the washing plate.

[0043] Meanwhile, the mop washing unit may further include a wastewater suction pipe in which a wastewater suction flow path through which liquid introduced through the wastewater inlet flows is formed, and the heater may be disposed above the wastewater suction pipe.

[0044] The mop drying unit may further include an external air supply module in which an external air supply flow path configured to allow external air to flow to the external air discharge portion is formed, and the external air supply module may be disposed above the wastewater suction pipe.

[0045] The station for a robot cleaner according to the present invention may further include a power supply module including a power supply terminal configured to contact a charging terminal of the robot cleaner and configured to supply power to the robot cleaner, and at least a portion of the power supply module may be disposed above the external air supply module.

[0046] Meanwhile, the mop washing unit may include a pair of washing water discharge ports configured to discharge washing water to the washing plate and a branch flow path configured to supply washing water to the pair of washing water discharge ports, and at least a portion of the branch flow path may be disposed below the external air supply module.

[0047] Meanwhile, the external air discharge portion may discharge air in a direction intersecting a direction in which the flow guide surface is formed.

[0048] Meanwhile, at least a portion of the power supply module may be disposed above the external air supply module.

[0049] Through this configuration, components for washing the mop and components for drying the mop may be stacked and arranged within a limited left-right space, thereby maximizing space efficiency.

[Advantageous Effects]

[0050] According to embodiments of the present invention, as described above, a module capable of charging the robot cleaner, collecting dust, and washing a mop is arranged along a horizontal direction with the robot cleaner, thereby achieving an effect of utilizing a lower space of a kitchen cabinet.

[0051] In addition, since a charging terminal, a dust collection unit, a mop washing unit, and a mop drying unit are arranged to surround the robot cleaner, various functions for the robot cleaner can be simultaneously performed.

[0052] In addition, the washing water supply unit, the washing plate, the washing tub, the wastewater discharge flow path, the external air supply module, and the power supply module are concentratedly disposed at a rear side of the mop of the robot cleaner, thereby enabling both washing and drying of the mop within a

limited space.

[0053] In addition, since surfaces other than a front surface are concealed by the kitchen cabinet, it is possible to provide aesthetic appeal to a user in terms of interior design.

[0054] In addition, when the robot cleaner is docked, dust in a dust bin of the robot cleaner is automatically collected. Therefore, the user only needs to take out a dust bag at regular intervals, thereby reducing the user's effort.

[0055] In addition, when the robot cleaner is docked, a mop of the robot cleaner can be automatically washed, thereby reducing the inconvenience of having to separate and wash the mop separately.

[0056] In addition, since detergent can be added as needed, an effect of increasing the washing performance of the mop can be achieved.

[0057] In addition, since the mop is washed using a water supply pipe and a drainage pipe of a kitchen, the inconvenience of a user having to separately supply water or discharge wastewater can be reduced.

[0058] In addition, since the mop can be automatically dried by supplying heated air to the mop after washing the mop of the robot cleaner, it is possible to prevent the occurrence of odors.

[0059] In addition, during a process of drying the mop, air after drying is discharged to a downstream side of the U-trap, thereby preventing odor from flowing backward.

[0060] In addition, when the robot cleaner enters the station for a robot cleaner, a door of the station for a robot cleaner is closed, thereby preventing dust from being scattered to the outside while dust in the dust bin is collected.

[0061] In addition, when the mop of the robot cleaner is washed, leakage of wastewater to the outside can be prevented.

[Brief Description of Drawings]

[0062]

FIG. 1 is a view for explaining a state in which a cleaner system according to an embodiment of the present invention is installed in a lower space of a kitchen cabinet.

FIG. 2 is a view for explaining a relationship in which a pipe of the cleaner system according to an embodiment of the present invention is connected to a drainage pipe.

FIG. 3 is a perspective view for explaining the cleaner system according to an embodiment of the present invention.

FIG. 4 is a plan view of FIG. 3.

FIG. 5 is a cross-sectional view of FIG. 3 taken along a front-rear direction.

FIG. 6 is a perspective view for explaining a robot cleaner according to an embodiment of the present invention.

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

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

FIG. 9 is a rear view of FIG. 6.

base FIG. 10 is a perspective view for explaining an internal structure of a station for a robot cleaner according to an embodiment of the present invention.

FIG. 11 is a plan view of FIG. 10.

FIGS. 12 and 13 are side views for explaining a dust collection unit of a station for a robot cleaner according to an embodiment of the present invention.

FIG. 14 is a cross-sectional view for explaining a dust collection flow path of a station for a robot cleaner according to an embodiment of the present invention.

FIG. 15 is an enlarged view for explaining a mop washing unit of a station for a robot cleaner according to an embodiment of the present invention.

FIG. 16 is an enlarged view for explaining a washing water supply unit of the mop washing unit of a station for a robot cleaner according to an embodiment of the present invention.

FIG. 17 is a view showing a state in which a dust collection unit and a detergent container are pulled out from a station for a robot cleaner according to an embodiment of the present invention.

FIG. 18 is a perspective view for explaining a mop drying unit of a station for a robot cleaner according to an embodiment of the present invention.

FIG. 19 is an enlarged view of the mop drying unit of a station for a robot cleaner according to an embodiment of the present invention.

FIG. 20 is a cross-sectional view for explaining a state in which air flows into an external air supply module according to an embodiment of the present invention.

FIGS. 21 and 22 are views for explaining an arrangement relationship on a horizontal plane of a station for a robot cleaner according to an embodiment of the present invention.

FIG. 23 is a view for explaining a state in which a drawer is provided in a station for a robot cleaner according to an embodiment of the present invention.

FIG. 24 is a view for explaining a state in which a drawer is pulled out from a station for a robot cleaner according to an embodiment of the present invention.

FIG. 25 is a block diagram for explaining a control configuration of a station for a robot cleaner according to an embodiment of the present invention.

FIG. 26 is a plan view for explaining an air discharge unit of a station for a robot cleaner according to another embodiment of the present invention.

FIG. 27 is a side view for explaining a path through which air discharged from an external air discharge portion is discharged in a station for a robot cleaner

according to another embodiment of the present invention.

FIG. 28 is a view of FIG. 27 viewed from another direction.

FIG. 29 is a side view for explaining a path through which air discharged from an external air discharge portion flows to dry a washing tub in a station for a robot cleaner according to another embodiment of the present invention.

FIG. 30 is a view for explaining an arrangement relationship of a washing water supply unit, a washing plate, an external air supply module, and a power supply module in a station for a robot cleaner according to another embodiment of the present invention.

FIG. 31 is a view of FIG. 30 viewed from another direction.

[Description of Embodiments]

[0063] Hereinafter, preferred embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[0064] Since the present invention may be modified in various ways and may have various embodiments, specific embodiments will be illustrated in the drawings and described in detail in the detailed description. However, this is not intended to limit the present invention to specific embodiments, and should be understood to include all modifications, equivalents, and substitutes included in the spirit and technical scope of the present invention.

[0065] In describing the present invention, terms such as "first" and "second" may be used to describe various components, but the components may not be limited by the terms. These terms are used only for the purpose of distinguishing one component from another. For example, a first component may be referred to as a second component, and similarly, a second component may also be referred to as a first component, without departing from the scope of the present invention.

[0066] The term "and/or" may include a combination of a plurality of related listed items or any item of a plurality of related listed items.

[0067] When a component is referred to as being "connected" or "coupled" to another component, it may be directly connected or coupled to the other component, but it should be understood that other components may exist therebetween. On the other hand, when a component is referred to as being "directly connected" or "directly coupled" to another component, it may be understood that no other components exist therebetween.

[0068] The terms used in the present application are used only to describe specific embodiments and are not intended to limit the present invention. Singular expressions include plural expressions unless the context clearly indicates otherwise.

[0069] In the present application, terms such as "comprise," "include," or "have" are intended to designate the existence of features, numbers, steps, operations, com-

ponents, parts, or combinations thereof described in the specification, and it should be understood that they do not preclude the possibility of the existence or addition of one or more other features, numbers, steps, operations, components, parts, or combinations thereof in advance.

[0070] Unless otherwise defined, all terms used herein, including technical or scientific terms, may have the same meaning as commonly understood by one of ordinary skill in the art to which the present invention belongs. Terms such as those defined in commonly used dictionaries may be interpreted as having a meaning consistent with the meaning in the context of the related art, and unless clearly defined in the present application, they may not be interpreted in an ideal or excessively formal sense.

[0071] In addition, the following embodiments are provided to more completely explain the present invention to those of ordinary skill in the art, and the shapes and sizes of elements in the drawings may be exaggerated for clarity of description.

KITCHEN CABINET AND CLEANER SYSTEM

[0072] FIG. 1 is a view for explaining a state in which a cleaner system according to an embodiment of the present invention is installed in a lower space of a kitchen cabinet, and FIG. 2 is a view for explaining a relationship in which a pipe of the cleaner system according to an embodiment of the present invention is connected to a drainage pipe.

[0073] A cleaner system 1 according to an embodiment of the present invention may be provided at a lower side of a kitchen cabinet 2. Specifically, the kitchen cabinet 2 may be disposed in a kitchen to store dishes, plates, cups, and the like, and may provide a space for cooking food or washing dishes.

[0074] In addition, the kitchen cabinet 2 may be provided with an upper plate (worktop) that can serve as a sink, a cooking counter, or a workbench.

[0075] For example, the kitchen cabinet 2 may include a sink providing a space for washing dishes on the upper plate. Alternatively, the kitchen cabinet 2 may include a cooking counter for performing cooking operations. In addition, the kitchen cabinet 2 may include a gas range stand on which a gas range, an induction heater, a high-light heater, an oven, or the like is installed on the upper plate.

[0076] Generally, as the kitchen cabinet 2, a standard cabinet having a width of 600 mm in a front-rear direction and a width of 600 mm in a left-right direction may be used.

[0077] A cleaner system 1 according to another embodiment of the present invention may be provided at a lower side of a structure including at least one of a water supply pipe and a drainage pipe. Specifically, the water supply pipe may refer to a flow path connected to an external water supply source that supplies fluid to the structure, and the drainage pipe may refer to a flow path

for discharging fluid discharged from the structure to a sewer.

[0078] A storage cabinet for storing tableware and kitchen tools may be provided at a lower portion of the kitchen cabinet 2 or the aforementioned structure. That is, the kitchen cabinet 2 or the structure may include an upper plate 22 providing a space for operations such as cooking or dishwashing, a lower plate 23 disposed to be spaced apart from the ground by a predetermined height, and a storage space formed between the upper plate 22 and the lower plate 23 to store tableware and kitchen tools. In this case, when the kitchen cabinet 2 is a sink, a sink bowl 22a may be disposed on the upper plate 22.

[0079] In addition, the lower plate 23 may be supported by a pedestal 21. The pedestal 21 is arranged along a direction vertical to a floor of the kitchen and may support the load of the kitchen cabinet 2. In this case, a space may be formed between the floor of the kitchen and the lower plate 23 according to the height of the pedestal 21.

[0080] Alternatively, it is also possible for the kitchen cabinet 2 to be fixed to a wall of a building without the pedestal 21. Even in this case, a space may be formed between the floor of the kitchen and the lower plate 23.

[0081] The cleaner system 1 according to an embodiment of the present invention is mounted in the space between the floor of the kitchen and the lower plate 23 (hereinafter, referred to as a "mounting space") as described above.

[0082] For example, the mounting space may have a height of 200 mm or less, and generally may have a height of 160 mm or less.

[0083] Therefore, according to the present invention, since the cleaner system 1 is disposed in the lower space of the kitchen cabinet 2, there is an effect of minimizing the exposure of the cleaner system 1 to the outside.

[0084] Furthermore, compared to a case where a charging stand for a robot cleaner is disposed in a certain space of a living room, a room, or a kitchen, the cleaner system 1 is disposed in an unutilized space created by the kitchen cabinet 2 without occupying a separate space, thereby maximizing space efficiency.

[0085] Meanwhile, the kitchen cabinet 2 or the aforementioned structure is provided with a drainage pipe 25 capable of draining liquid used for cooking or water used for dishwashing. At least a portion of the drainage pipe 25 may be disposed in the storage space formed between the upper plate 22 and the lower plate 23. Generally, the drainage pipe 25 may be connected to a drain formed in the sink bowl 22a of the sink. The drainage pipe 25 includes a U-trap 25a for preventing a backflow of contaminated gas or odors. The U-trap 25a may be disposed in the storage space. Liquid introduced through the drain flows downward by gravity in an upstream 25b of the U-trap, accumulates in the U-trap 25a, and when water rises above a predetermined level set by the U-trap 25a, flows downward along a downstream 25c of the U-trap to be discharged to a sewer.

[0086] The cleaner system 1 according to an embodi-

ment of the present invention may wash and dry the mop 242 of the robot cleaner 200 using the drainage pipe 25 as described above.

[0087] In addition, although not shown, the kitchen cabinet 2 may be provided with a water supply pipe. Fresh water (or purified water) may be supplied to the cleaner system 1 through the water supply pipe.

[0088] Hereinafter, a specific structure of the cleaner system 1 will be described.

CLEANER SYSTEM

[0089] Meanwhile, FIG. 3 to FIG. 5 are views for explaining the cleaner system according to an embodiment of the present invention.

[0090] The cleaner system 1 according to an embodiment of the present invention may include a station for a robot cleaner 100 and a robot cleaner 200.

[0091] The cleaner system 1 includes the station for a robot cleaner 100. The robot cleaner 200 may be docked with the station for a robot cleaner 100. Specifically, the robot cleaner 200 may enter through a front surface of the station for a robot cleaner 100, and the robot cleaner 200 may be accommodated inside the station for a robot cleaner 100. The station for a robot cleaner 100 may remove dust from a dust bin 220 of the robot cleaner 200. The station for a robot cleaner 100 may wash a rotary cleaning unit 240 of the robot cleaner 200. The station for a robot cleaner 100 may dry the rotary cleaning unit 240 of the robot cleaner 200. The station for a robot cleaner 100 may supply power to the robot cleaner 200.

ROBOT CLEANER

[0092] Meanwhile, FIGS. 6 to 9 disclose views for explaining a robot cleaner in the robot cleaner system according to an embodiment of the present invention.

[0093] The structure of the robot cleaner 200 will be described with reference to FIGS. 6 to 9 as follows.

[0094] The robot cleaner 200 may automatically clean a target area by traveling autonomously and suctioning foreign substances such as dust from a floor.

[0095] The robot cleaner 200 according to an embodiment of the present invention is configured to be placed on a floor and clean the floor while moving along a floor surface. Accordingly, in the following description, the vertical direction will be defined based on a state where the robot cleaner 200 is placed on the floor.

[0096] And based on a pair of wheels 260, the side where a sub-wheel 270 (to be described later) is disposed is defined as the front, and the side where a rotary cleaning unit 240 (to be described later) is disposed is defined as the rear for description.

[0097] The "lowest part" of each configuration described in embodiments of the present invention may be the lowest positioned part in each configuration when the robot cleaner 200 according to embodiments of the present invention is placed on a floor and used, or may be

the part closest to the floor.

[0098] The robot cleaner 200 according to an embodiment of the present invention is configured to include a body 210, a dust bin 220, a water tank 230, a rotary cleaning unit 240, an agitator 250, wheels 260, a sub-wheel 270, and a charging terminal 280.

[0099] The body 210 may form the overall appearance of the robot cleaner 200. Each component constituting the robot cleaner 200 may be coupled to the body 210, and some components constituting the robot cleaner 200 may be accommodated inside the body 210.

[0100] Specifically, components of the robot cleaner 200 may be provided in an internal space of the body 210. For example, the body 210 may accommodate a battery and at least one motor in the internal space.

[0101] In embodiments of the present invention, the body 210 may be configured in a shape in which a width (or diameter) in a horizontal direction (direction parallel to X and Y) is greater than a height in a vertical direction (direction parallel to Z). This body 210 helps the robot cleaner 200 to form a stable structure and may provide a structure advantageous for avoiding obstacles when the robot cleaner 200 moves (travels).

[0102] When viewed from above or below, the body 210 may be formed in various shapes such as a circle, an ellipse, or a rectangle.

[0103] The body 210 may be configured to be divided into a lower body and an upper body, and the lower body and the upper body may be coupled to form a space therein.

[0104] The lower body may be coupled with the upper body to form a space capable of accommodating a battery, at least one sensor, and at least one motor therein.

[0105] The lower body may be formed with the suction port 211 through which air is introduced and holes for accommodating a pair of wheels 260.

[0106] The suction port 211 may be a passage through which dust on a floor surface is introduced. Further, the suction port 211 may communicate with a suction flow path (not shown) formed inside the body 210, and the suction flow path may communicate with an internal space of the dust bin 220.

[0107] Meanwhile, an exhaust flow path may be further provided in the lower body. One side of the exhaust flow path may communicate with the internal space of the dust bin 220, and the other side thereof may communicate with an exhaust port. In this case, a filter may be disposed at the exhaust port.

[0108] With such a configuration, air introduced through the suction port 211 flows into the dust bin 220 through the suction flow path and may be discharged to the exhaust port through the exhaust flow path.

[0109] An agitator 250, which will be described later, may be rotatably accommodated in the suction port 211. With such a configuration, dust around the suction port 211 may be guided into the suction port 211 by rotation of the agitator 250, thereby increasing dust suction efficiency.

[0110] The upper body may form an upper appearance of the robot cleaner 200. Although not shown, a display may be provided on the upper body.

[0111] Although not shown, the robot cleaner 200 of the present invention may include a bumper. The bumper is coupled along a rim of the body 210 and is configured to move relative to the body 210.

[0112] The bumper may be coupled along a part of the rim of the body 210, or may be coupled along the entire rim of the body 210. At least one elastic member (not shown) may be provided between the bumper and the body 210. With such a configuration, when the bumper moves relatively toward a center of the body 210 by contacting an obstacle or the like, the bumper may return to an original position by a restoring force of the elastic member (not shown), and an impact applied to the bumper may be absorbed or dispersed to prevent and reduce transmission of the impact to the body 210.

[0113] The dust bin 220 may be provided to suction external dust and air and to store the dust.

[0114] The dust bin 220 may store dust introduced through the suction flow path. The dust bin 220 may be formed with a dust inlet communicating with the suction flow path, an internal space for storing dust may be formed therein, and an air outlet through which air is discharged may be formed.

[0115] The dust bin 220 may be provided inside the body 210. In this case, the dust bin 220 may be fixedly coupled to the body 210 or may be detachably provided according to embodiments.

[0116] Meanwhile, in the present invention, a dust discharge flow path may be formed in the dust bin 220. The dust discharge flow path may communicate the internal space of the dust bin 220 with an external space of the robot cleaner 200. With such a configuration, when dust is collected through the station for a robot cleaner 100, the dust inside the dust bin 220 may be removed.

[0117] Meanwhile, the dust bin 220 according to an embodiment of the present invention may be formed with a dust discharge port 221 communicating with the dust discharge flow path. For example, the dust discharge port 221 may be formed at one side of a rear of an outer surface (or an outer peripheral surface) of the body 210. As another example, the dust discharge port 221 may be formed on an outer surface of the dust bin 220.

[0118] In addition, the robot cleaner 200 according to an embodiment of the present invention may be provided with a dust bin door 222 capable of selectively opening and closing the dust discharge port 221. Specifically, the dust bin door 222 is coupled to the body 210 and may be disposed at a position capable of blocking the dust discharge port 221. For example, the dust bin door 222 may be formed of a rubber or resin material and provided to be flippable, with one side thereof fixedly coupled to the body 210.

[0119] With such a configuration, when a dust collection motor 145 of the station for a robot cleaner 100, which will be described later, is operated, the dust bin door 222

is elastically deformed by a driving force of the dust collection motor 145, and as the dust discharge port 221 is opened, dust in the dust bin 220 may be collected into a dust collection unit 140 of the station for a robot cleaner 100.

[0120] The water tank 230 is configured in a form of a container having an internal space so that liquid such as water is stored therein. The water tank 230 is disposed inside the body 210 and may be fixedly coupled to the body 210 or may be detachably coupled to the body 210.

[0121] The water tank 230 includes a supply unit 231 and a nozzle (not shown). The supply unit 231 may be provided so that liquid such as water is supplied from the outside. For example, the supply unit 231 may have an inlet formed at the other side of the rear of the outer surface (or outer peripheral surface) of the body 210 and may be connected to a storage space inside the water tank 230 through a water supply hose.

[0122] In this case, the supply unit 231 may be disposed at an opposite side in a left-right direction of the robot cleaner 200 with respect to the dust discharge port 221. For example, if the dust discharge port 221 is disposed at a rear left side of the body 210, the supply unit 231 may be disposed at a rear right side of the body 210.

[0123] Through such a configuration, in a state where the robot cleaner 200 is docked with the station for a robot cleaner 100, the station for a robot cleaner 100 may simultaneously perform dust collection and water injection.

[0124] Meanwhile, the nozzle (not shown) is configured in a form of a tube or a pipe and is connected to the water tank 230 so that the liquid inside the water tank 230 can flow through an interior thereof. One side of the nozzle (not shown) is connected to the water tank 230, and the other end thereof is disposed to be positioned above each of a pair of rotary plates 241 on the rotary plates 241, so that the liquid inside the water tank 230 can be supplied to each of a pair of mops 242.

[0125] That is, the nozzle (not shown) may be configured in a form in which one pipe is branched into two, and in this case, one branched end may be positioned above a left mop, and the other branched end may be positioned above a right mop.

[0126] Meanwhile, although not shown, a pump may be provided in the water tank 230 to cause the water inside the water tank 230 to flow to the nozzle (not shown). Therefore, when the pump of the water tank 230 is operated, the liquid stored in the water tank 230 may be discharged to the rotary cleaning unit 240 through the nozzle (not shown).

[0127] The rotary cleaning unit 240 includes the rotary plates 241 and the mops 242.

[0128] The rotary plates 241 may be provided as a pair including a left rotary plate and a right rotary plate, and the mops 242 may be provided as a pair including a left mop and a right mop.

[0129] The rotary plates 241 may be rotatably disposed on a bottom surface of the body 210, and the

mops 242 may be coupled to a lower side thereof.

[0130] The rotary plate 241 is configured to have a predetermined area and is formed in a shape of a flat plate or a flat frame. Such a rotary plate 241 is generally laid horizontally, and accordingly, is configured in a shape in which a width (or diameter) in a horizontal direction is sufficiently larger than a height in a vertical direction. The rotary plate 241 coupled to the body 210 may be parallel to a floor surface B or may be inclined with respect to the floor surface B. The rotary plate 241 may be formed in a shape of a circular plate, a bottom surface of the rotary plate 241 may generally have a circular shape, and the rotary plate 241 may have a rotationally symmetrical shape as a whole.

[0131] A pair of rotary plates 241 may be symmetrical to each other in a left-right direction.

[0132] The mop 242 may be coupled to a lower side of the rotary plate 241 so as to face the floor surface B.

[0133] The mop 242 is configured such that a bottom surface facing the floor has a predetermined area, and the mop 242 is configured in a flat shape. The mop 242 is configured in a shape in which a width (or diameter) in a horizontal direction is sufficiently larger than a height in a vertical direction. When the mop 242 is coupled to the body 210 side, a bottom surface of the mop 242 may be parallel to the floor surface B or may be inclined with respect to the floor surface B.

[0134] The bottom surface of the mop 242 may generally have a circular shape, and the mop 242 may have a rotationally symmetrical shape as a whole. In addition, the mop 242 may be detachably attached to the bottom surface of the rotary plate 241 and may be coupled to the rotary plate 241 to rotate together with the rotary plate 241.

[0135] Meanwhile, although not shown, a driving unit for applying a rotational force to the rotary plate 241 may be provided in the rotary cleaning unit 240. For example, the driving unit may include a motor and at least one gear. Accordingly, when the driving unit is operated, the rotary plate 241 and the mop 242 rotate to wipe and clean the floor surface.

[0136] The agitator 250 may be rotatably provided with a plurality of brushes to guide external dust and air into the dust bin 220. In this case, at least one gear may be provided in the agitator 250.

[0137] Meanwhile, the agitator 250 according to the present embodiment may be installed with a separate agitator motor (not shown) to receive rotational power, but may also receive rotational power from a traveling motor according to embodiments, and may also receive rotational power from a driving unit of the rotary cleaning unit 240.

[0138] The wheels 260 may be provided on a bottom surface of the body 210 and may be connected to a driving unit (not shown). In this case, the driving unit (not shown) may be coupled to the body 210.

[0139] The wheels 260 are provided on the body 210 and may roll on the floor surface.

[0140] The wheels 260 may be configured as a first traveling wheel and a second traveling wheel. In this case, the first traveling wheel may be configured identically to the second traveling wheel, or may be configured symmetrically. For example, if the first traveling wheel is located on the left side of the robot cleaner 200, the second traveling wheel may be located on the right side of the robot cleaner 200, and in this case, the first traveling wheel and the second traveling wheel may be symmetrical to each other in the left-right direction.

[0141] The driving unit (not shown) may be configured to include a traveling motor and gears. In this case, the traveling motor is accommodated inside the body 210 and may provide power to the wheels 260. The traveling motor may include a first traveling motor and a second traveling motor.

[0142] The traveling motor may be configured as an electric motor. The plurality of gears are configured to mesh with each other and rotate, connect the traveling motor and the wheels 260, and transmit rotational power of the traveling motor to the wheels 260. Therefore, the wheels 260 may rotate when a rotating shaft of the traveling motor rotates.

[0143] With such a configuration, when the traveling motor is operated, the wheels 260 rotate, and the body 210 may travel at a predetermined traveling speed on the floor surface.

[0144] The sub-wheel 270 is provided on a lower surface of the body 210 and may roll on the floor surface (surface to be cleaned). The sub-wheel 270 may support the body 210 on the floor surface together with the pair of wheels 260. With such a configuration, the sub-wheel 270 can minimize friction between the robot cleaner 200 and the floor surface while guiding the movement of the robot cleaner 200.

[0145] A suction motor (not shown) may generate suction force capable of suctioning external dust and air through the suction port 211. For example, the suction motor (not shown) may be an electric motor. External dust and air may be introduced into the suction port 211 by the suction force generated by the suction motor (not shown) and may reach the dust bin 220 after passing through the suction flow path.

[0146] Although not shown, a battery is coupled to the body 210 and configured to supply power to other components constituting the robot cleaner 200. The battery may supply power to at least one motor provided in the robot cleaner 200. For example, the battery may supply power to motors provided in the rotary cleaning unit 240, the agitator 250, the wheels 260, and the suction motor (not shown).

[0147] In addition, the battery may supply power to a sensor unit (not shown) and a control unit (not shown).

[0148] The battery may be charged by an external power source, and for this purpose, a charging terminal 280 for charging may be provided on one side of the body 210. For example, the charging terminal 280 may be disposed at a rear side of an outer surface of the body

210. When the robot cleaner 200 is docked with the station for a robot cleaner 100, the charging terminal 280 may come into contact with a power supply terminal 123b of the station for a robot cleaner 100 to receive power.

STATION FOR A ROBOT CLEANER

[0149] FIG. 10 is a perspective view for explaining a station for a robot cleaner according to an embodiment of the present invention, and FIG. 11 is a plan view of FIG. 10.

[0150] The station for a robot cleaner 100 of the present invention will be described with reference to FIGS. 10 and 11 as follows.

[0151] The robot cleaner 200 may be accommodated in the station for a robot cleaner 100. The robot cleaner 200 may be docked with a seating unit 120 of the station for a robot cleaner 100.

[0152] The station for a robot cleaner 100 may include a housing 110.

[0153] The housing 110 may form an appearance of the station for a robot cleaner 100. For example, the housing 110 may be formed in a shape similar to a hexahedron including at least one outer wall surface.

[0154] The housing 110 may have a space formed therein capable of accommodating the seating unit 120, a dust collection flow path 130, a dust collection unit 140, a dust collection motor 145, a mop washing unit 160, a mop drying unit 170, and a circulation flow path.

[0155] The housing 110 may be mounted at a lower side of a kitchen cabinet 2. Specifically, the housing 110 may be installed in a mounting space formed between a lower plate 23 of the kitchen cabinet 2 and a floor of a kitchen.

[0156] The housing 110 includes a pair of outer walls 111 facing each other forming an appearance. The outer wall 111 may refer to a surface formed along a direction of gravity.

[0157] For example, the pair of outer walls 111 may be installed at a lower side of the kitchen cabinet 2 at a predetermined interval. As another example, the housing 110 further includes a bottom surface facing the floor of the kitchen, and the pair of outer walls 111 may be connected through the bottom surface. As another example, the housing 110 further includes a bottom surface facing the floor of the kitchen and an upper surface 113 facing the lower plate 23 of the kitchen cabinet 2, and both upper and lower ends of the pair of outer walls 111 may be connected to each other through the bottom surface and the upper surface 113.

[0158] Accordingly, even when foreign substances fall downward from the kitchen cabinet 2, it is possible to prevent components of the robot cleaner 200 and the station for a robot cleaner 100 from being contaminated. As still another example, the housing 110 may further include a rear surface 111b facing a wall of a building.

[0159] With such a configuration, components of the

station for a robot cleaner 100 may be accommodated inside the housing 110 (between the pair of outer wall surfaces).

[0160] In addition, the robot cleaner 200 may be accommodated inside the housing 110. The housing 110 may be arranged such that the pair of outer walls 111 has an interval larger than a maximum horizontal width of the robot cleaner 200. With such a configuration, the robot cleaner 200 may enter and exit the interior of the housing 110.

[0161] In this case, in the present embodiment, the robot cleaner 200 may enter and exit through the front of the station for a robot cleaner 100. Here, the front may refer to a direction in which a door 126 is provided based on the interior of the station for a robot cleaner 100.

[0162] In addition, the rear may refer to a direction opposite to the front based on the interior of the station for a robot cleaner 100. For example, a wall of a building (not shown) may be disposed at the rear of the station for a robot cleaner 100.

[0163] In addition, based on when looking forward from the inside of the station for a robot cleaner 100, the left side may be referred to as a leftward side, and the right side may be referred to as a rightward side.

[0164] That is, the outer wall 111 of the station for a robot cleaner 100 may be disposed at the leftward side and the rightward side, respectively.

[0165] Accordingly, the upper side of the housing 110 is concealed by the kitchen cabinet 2, and the lower side of the housing 110 may be concealed by the floor of the kitchen. In addition, left and right side surfaces of the housing 110 exist in a state covered by the outer wall, but are disposed at the lower portion of the kitchen cabinet 2. In this case, since a portion of the lower portion of the kitchen cabinet 2 excluding the station for a robot cleaner 100 is finished by a baseboard 26, only the front surface of the housing 110 may be exposed to the outside as a result.

[0166] Through this, exposure of the station for a robot cleaner 100 and the robot cleaner 200 to the outside can be minimized.

[0167] With such a configuration, the station for a robot cleaner 100 of the present invention has an effect of providing aesthetic appeal to a user in terms of interior design.

[0168] Meanwhile, although not shown, the housing 110 may have a space through which a water supply hose connected to a water supply pipe passes, a space through which a drainage hose for discharging wastewater generated after washing the mop 242 passes, and a space through which a hose for discharging moisture generated during a drying process of the mop 242 passes. For example, at least one of the outer wall 111 and the upper surface 112 the third outer wall member 111c, and the upper cover 113 of the housing 110 may have a space formed therein through which the aforementioned hoses can pass.

SEATING UNIT

[0169] As shown in FIG. 1, The station for a robot cleaner 100 may include a seating unit 120.

[0170] The robot cleaner 200 and the station for a robot cleaner 100 may be connected physically, electrically, and/or fluidly through the seating unit 120.

[0171] The seating unit 120 may be disposed inside the housing 110. In this case, according to embodiments, the seating unit 120 may be provided to be pulled out from the housing 110 through a drawer 190.

[0172] With such a configuration, when cleaning or repair of the seating unit 120 is required, or when replacement of some parts is necessary, there is an effect that a user can easily pull out the seating unit 120 for maintenance.

[0173] The seating unit 120 may have an entrance 127 formed therein, through which the robot cleaner 200 enters. The entrance 127 may refer to a space formed on a front surface of the station for a robot cleaner 100.

[0174] The entrance 127 may be formed in a size through which the robot cleaner 200 can pass. That is, a height of the entrance 127 is formed to be larger than a height of the robot cleaner 200. In this case, the entrance 127 may refer to a space formed upward along a vertical direction from a front end of a base 121, which will be described later, and an upper end of the entrance may be the same as a lower surface of the lower plate 23 of the kitchen cabinet 2 or an upper end of the housing 110.

[0175] In addition, a width of the entrance 127 in a left-right direction is formed to be larger than a maximum width of the robot cleaner 200. In this case, at least one of a dust collection unit 140 and a mop washing unit 160 may be disposed on left and right sides of the entrance 127. Accordingly, left and right ends of the entrance 127 may form a boundary with the dust collection unit 140 and the mop washing unit 160. If either the dust collection unit 140 or the mop washing unit 160 is not present, an outer wall surface of the housing 110 may serve as the boundary.

[0176] In this case, the entrance 127 may be opened and closed by a door 126. The door 126 is disposed at the upper end or a lower end of the entrance 127, and a rotation axis may be provided along a direction parallel to the base 121. The door 126 may be hinged to the housing 110. Alternatively, the door 126 may be hinged to an inner wall 124 of the seating unit 120. The door 126 may be rotated by a door driving unit 126a. For example, the door driving unit 126a may be a motor.

[0177] For example, the door 126 may be formed in a shape of a rectangular flat plate, a hinge part 126b may be provided at an upper end thereof, and the door driving unit 126a may be connected to one end of the hinge part 126b in an axial direction. In this case, the hinge part 126b of the door 126 may be directly connected to a shaft of the door driving unit 126a, or may be connected to enable power transmission through at least one gear.

[0178] The door 126 may maintain a state in which the

entrance 127 is closed when the robot cleaner 200 is accommodated in the seating unit 120. Further, when the robot cleaner 200 starts traveling from the seating unit 120, the door 126 may be rotated to open the entrance 127. Then, the door 126 may be rotated to close the entrance 127 after the robot cleaner 200 passes through the entrance 127. In addition, the door 126 may be rotated to open the entrance 127 when the robot cleaner 200 approaches from the outside of the station for a robot cleaner 100.

[0179] The seating unit 120 may include an accommodation space S, a base 121, a coupling wall 123, and an inner wall 124.

[0180] The robot cleaner 200 may be accommodated in the accommodation space S of the seating unit 120. For example, the accommodation space S may refer to a space surrounded by the base 121, the coupling wall 123, and the inner wall 124. As another example, the accommodation space S may refer to a space surrounded by the base 121, a washing plate 122, the coupling wall 123, and the inner wall 124. As still another example, the accommodation space S may refer to a space where the robot cleaner 200 is positioned in a state where the robot cleaner 200 is coupled to a power supply terminal 123b, or a space where the robot cleaner 200 is positioned in a state where a dust bin 220 of the robot cleaner 200 communicates with a dust passage hole 123a.

[0181] The base 121 may be disposed such that the station for a robot cleaner 100 comes into contact with a floor surface, and is configured to support the robot cleaner 200 when the robot cleaner 200 is docked with the station for a robot cleaner 100. The base 121 may include a base body 121a, an inclined portion 121b, a wheel coupling portion 121c, an agitator accommodating portion 121d, and a washing tub 128.

The base body 121a may form an overall appearance of the base 121. The inclined portion 121b, the wheel coupling portion 121c, the agitator accommodation portion 121d, and the washing tub 128 may be disposed on the base body 121a.

[0182] The base body 121a may be configured in a shape in which a width (or diameter) in a horizontal direction (direction parallel to X and Y) is greater than a height in a vertical direction (direction parallel to Z). Due to such a structure, there is an effect that the station for a robot cleaner 100 can be stably supported on the floor surface.

[0183] An circulation flow path may be provided inside the base body 121a. Accordingly, air discharged from the dust collection motor 145 may flow through the circulation flow path formed inside the base body 121a and be exhausted to the air discharge port 125b.

[0184] The inclined portion 121b may be disposed at an entrance of the base body 121a where the robot cleaner 200 climbs.

[0185] The inclined portion 121b may have an upward

slope toward the front in a direction in which the robot cleaner 200 enters. More specifically, a front-side end of the entrance side of the inclined portion 121b is connected so as not to have a height difference from the ground, but may have a slope that increases toward the front in the direction in which the robot cleaner 200 enters. In this case, the front in the direction in which the robot cleaner 200 enters refers to the rear based on the station for a robot cleaner 100. Accordingly, the robot cleaner 200 can easily climb from the ground to the station for a robot cleaner 100.

[0186] A wheel guide portion 121ba may be provided on the inclined portion 121b.

[0187] The wheel guide portion 121ba may be formed in a shape of a groove to guide movement of the wheels 260 of the robot cleaner 200. A surface of the wheel guide unit 121ba may be formed to correspond to a surface of the wheels 260 so that the robot cleaner 200 can travel stably. In addition, the wheel guide unit 121ba may be formed such that a width of the groove at the entrance where the robot cleaner 200 climbs is larger than a width of the wheels 260, and the width of the groove becomes narrower toward the front of a climbing path of the robot cleaner 200 compared to the entrance. Accordingly, the wheels 260 of the robot cleaner 200 can easily enter the station for a robot cleaner 100, and lateral movement is limited by the groove that gradually narrows, so that the wheels 260 can be guided to a correct position.

[0188] A sub-wheel guide portion 121bb may be provided on the inclined portion 121b.

[0189] The sub-wheel guide portion 121bb may be formed in a groove shape to guide movement of the sub-wheel 270 of the robot cleaner 200. In addition, the sub-wheel guide portion 121bb may be formed in a protruding shape to contact the sub-wheel 270 when the wheels 260 of the robot cleaner 200 are seated on the wheel coupling portion 121c. Accordingly, when the robot cleaner 200 travels on the inclined portion 121b, the robot cleaner 200 can travel while being stably supported by the sub-wheel 270 as well as the wheels 260.

[0190] The wheels 260 of the robot cleaner 200, which have moved upward along the wheel guide portion 121ba, may be seated on the wheel coupling portion 121c. When the wheels 260 of the robot cleaner 200 are seated on the wheel coupling portion 121c, physical coupling between the robot cleaner 200 and the station for a robot cleaner 100 may be achieved. A surface of the wheel coupling portion 121c may be formed to correspond to the surface of the wheels 260 so that the robot cleaner 200 can be stably stopped. The wheel coupling portion 121c may extend from an upper end of the wheel guide unit 121ba. The wheel coupling portion 121c may be connected to the wheel guide portion 121ba without a step. Accordingly, the robot cleaner 200 can easily move to the wheel coupling portion 121c past the inclined portion 121b.

[0191] The wheel coupling portion 121c may be disposed at a stop position of the left and right wheels 260 of

the robot cleaner 200 so that the robot cleaner 200 stops at the correct position. Here, the stop position of the wheels 260 refers to a position determined for the robot cleaner 200 to stop in order to be coupled to the power supply terminal 123b and/or a position determined for the robot cleaner 200 to stop in order for the dust bin 220 of the robot cleaner 200 to communicate with the dust passage hole 123a.

[0192] A shape of the wheel coupling portion 121c may be formed in a shape corresponding to the shape of the wheels 260 of the robot cleaner 200, that is, an arch shape. Through such a configuration, the robot cleaner 200 moves along the wheel guide unit 121ba and can stop at the same time as the wheels 260 are inserted into the wheel coupling portion 121c, and the wheels 260 can be stably seated on the arch-shaped wheel coupling portion 121c.

[0193] The agitator accommodation portion 121d may accommodate at least a portion of the agitator 250 of the robot cleaner 200. Specifically, the agitator accommodation portion 121d may provide a space in which the agitator 250 of the robot cleaner 200 is accommodated in a state where the wheels 260 of the robot cleaner 200 are seated on the wheel coupling portion 121c.

air discharge port 125bair discharge port 125bair discharge port 125bair discharge port 125bThe agitator accommodation portion 121d may be formed between the wheel coupling portions 121c. The agitator accommodation portion 121d may be formed in a shape corresponding to the agitator 250 of the robot cleaner 200. The agitator accommodation portion 121d may be formed in a rectangular parallelepiped shape with an open top. A bottom surface of the agitator accommodation portion 121d may be sealed by the bottom surface of the base body 121a or the bottom surface of the housing 110. Accordingly, the agitator 250 of the robot cleaner 200, which has moved upward along the inclined portion 121b, may be seated in the recess 121da through the open upper surface of the agitator accommodation portion 121d. In this case, a depth of the recess 121da may be formed to be shallower than a depth of the wheel coupling portion 121c.

[0194] The agitator accommodation portion 121d may include a recess 121da and a protrusion 121db.

[0195] The recess 121da may be formed to be recessed from the base 121. The recess 121da may form an accommodation space in which at least a portion of the agitator 250 is accommodated. Through this, in a state where the wheels 260 of the robot cleaner 200 are seated on the wheel coupling portion 121c, at least a portion of the agitator 250 may be accommodated in the accommodation space of the recess 121da.

[0196] The accommodation space S of the recess 121da may communicate with the accommodation space S of the seating unit 120.

[0197] The protrusion 121db may be formed to protrude from the base 121. The protrusion 121db may be disposed along a rim of the recess 121da. In addition, in a

state where the agitator 250 is accommodated in the accommodation space of the recess 121da, the protrusion 121db may be disposed to be spaced apart from the body 210 of the robot cleaner 200 by a predetermined distance.

[0198] The protrusion 121db may guide air discharged through the air discharge port 125b to the suction port 211 of the robot cleaner 200. Through this, the air discharged to the accommodation space of the recess 121da may be guided to the suction port 211 of the robot cleaner 200 by the protrusion 121db.

[0199] The air discharge port 125b may be formed in the agitator accommodation portion 121d. The air discharge port 125b may be formed on a side surface of the agitator accommodation portion 121d. The air discharge port 125b may connect the recess 121da and the dust collection motor 145 through the circulation flow path. The recess 121da and the circulation flow path may communicate with each other through the air discharge port 125b. Accordingly, air discharged from the dust collection motor 145 may pass through the air discharge port 125b and be discharged to the recess 121da of the agitator accommodation portion 121d.

[0200] The coupling wall 123 is a configuration in which the dust passage hole 123a, the power supply terminal 123b, and a water supply nozzle 123c of the station for a robot cleaner 100 are disposed. The coupling wall 123 may spatially distinguish the accommodation space S from components of the station for a robot cleaner 100. The coupling wall 123 may extend in a vertical direction from the rear side of the base 121. The coupling wall 123 may be formed to correspond to a shape of the robot cleaner 200. For example, when the body 210 of the robot cleaner 200 has a cylindrical shape, the coupling wall 123 may be formed in a shape of a circular arc having a predetermined radius. With such a configuration, the coupling wall 123 can surround an outer periphery of the robot cleaner 200 and increase an area capable of facing an outer surface of the robot cleaner 200. In addition, the robot cleaner 200 can be stably supported.

[0201] The dust passage hole 123a may be formed in the seating unit 120 so that air outside the housing 110 can be introduced into an interior thereof. Specifically, the dust passage hole 123a may be formed in the seating unit 120 so that air outside the housing 110 can be introduced into the interior. The dust passage hole 123a may communicate with the dust bin 220 of the robot cleaner 200. The dust passage hole 123a may communicate with the dust discharge port 221 of the dust bin 220 of the robot cleaner 200. The dust passage hole 123a may be formed in a hole shape corresponding to the shape of the dust bin 220 so that dust in the dust bin 220 is introduced into the dust collection unit 140. The dust passage hole 123a may be formed to correspond to a shape of the dust discharge port 221 of the dust bin 220. The dust passage hole 123a may be formed to communicate with the dust collection flow path 130. Air suctioned through the dust passage hole 123a may flow through the dust collection flow path

130 and then be exhausted through the exhaust unit 125.

[0202] The station for a robot cleaner 100 may include a power supply module for supplying power to the robot cleaner 200. The power supply module may include a power supply module housing and a power supply terminal 123b, and a circuit board and components for power supply may be mounted in the power supply module housing. The power supply terminal 123b may be disposed forward from the power supply module housing so as to be exposed on the coupling wall 123.

[0203] The power supply terminal 123b may supply power to the robot cleaner 200 docked with the seating unit 120. The power supply terminal 123b may come into contact with the charging terminal of the robot cleaner 200 to be electrically connected thereto. The power supply terminal 123b may be disposed in the seating unit 120. Specifically, the power supply terminal 123b may be disposed on the coupling wall 123. The power supply terminal 123b may be electrically connected to the robot cleaner 200 coupled to the coupling wall 123. The power supply terminal 123b may supply power to a battery of the robot cleaner 200 coupled to the coupling wall 123.

[0204] The station for a robot cleaner 100 may further include a water supply nozzle 123c.

[0205] The water supply nozzle 123c may be connected to the supply unit 231 of the water tank 230 of the robot cleaner 200. Specifically, the water supply nozzle 123c may be connected to an inlet of the water tank 230. The inlet is configured to be connected to the water tank 230 of the robot cleaner 200. The water supply nozzle 123c may supply water supplied from a water supply pipe of the kitchen cabinet 2 to a storage space inside the water tank 230 of the robot cleaner 200.

[0206] The inner wall 124 is a configuration for spatially distinguishing the accommodation space S of the seating unit 120 from components of the station for a robot cleaner 100.

[0207] A pair of inner walls 124 may be disposed on left and right sides of the base 121. The inner wall 124 may be connected to both ends of the coupling wall 123.

[0208] The inner wall 124 may extend from the left and right sides of the base 121 in a direction intersecting the base 121. Specifically, the inner wall 124 may extend in a vertical direction from the left and right sides of the base 121. A height of the inner wall 124 may be formed to correspond to a height of the pedestal 21. Specifically, the height of the inner wall 124 may be formed to be the same as the height of the pedestal 21.

[0209] Meanwhile, various components such as a dust collection flow path 130, a dust collection unit 140, a dust collection motor 145, a detergent container 163, and a wastewater container 164 may be disposed outside the inner wall 124. Specifically, the dust collection unit 140, the detergent container 163, and the wastewater container 164 may be accommodated in a space between the inner wall 124 and the outer wall 111 of the housing 110.

[0210] The dust collection unit 140 and the detergent container 163 may be separated from the space between

the inner wall 124 and the outer wall 111 of the housing 110 in a sliding manner. Widths of the dust collection unit 140 and the detergent container 163 in a left-right direction may be formed to correspond to a distance between the inner wall 124 and the outer wall 111 of the housing 110.

[0211] The washing plate 122 is a configuration for washing the mop of the robot cleaner 200, and the washing plate 122 may be seated on the washing tub 128 of the base 121. In addition, the washing plate 122 may come into contact with the mop 242 in a state where the robot cleaner 200 is seated.

[0212] The washing plate 122 may be a plate formed to be inclined downward toward a central portion thereof.

[0213] Specifically, the washing plate 122 may include a flow guide surface 122c formed in a curved shape. At least one passage hole 122b through which a fluid may pass may be formed in the flow guide surface 122c. In addition, washing protrusions 122a may be formed to protrude from the flow guide surface 122c.

[0214] In this case, a pair of washing protrusions 122a may be symmetrically formed on the flow guide surface 122c. Specifically, the pair of washing protrusions 122a may be disposed vertically below the pair of mops 242 of the robot cleaner 200 so as to face the pair of mops 242, and may be disposed to be capable of contacting at least a portion of the pair of mops 242.

[0215] The passage holes 122b may be formed in plurality in the flow guide surface 122c and may be formed between the pair of washing protrusions 122a. For example, the passage holes 122b may be formed in plurality including a position having the lowest height from the ground (the floor of the kitchen) in the flow guide surface 122c and may be formed between the pair of washing protrusions 122a. Accordingly, fluid discharged between the pair of washing protrusions 122a may be guided to flow through the passage holes 122b.

[0216] Meanwhile, the flow guide surface 122c may have a height from the floor of the kitchen that increases toward a rear side from a position where the passage holes 122b are formed. That is, the flow guide surface 122c may have a height from the floor of the kitchen that increases as the flow guide surface 122c becomes closer to an external air discharge portion 171c to be described later.

[0217] With such a configuration, washing water and/or air may have its flow guided by the flow guide surface 122c and may pass through the passage holes 122b into a space formed between the washing plate 122 and the washing tub 128. Accordingly, heated air may pass through the passage holes 122b and be supplied to the washing tub 128.

[0218] Accordingly, when the mop 242 of the robot cleaner 200 is seated on the washing plate 122 and a driving unit of the rotary cleaning unit 240 is driven, the mop 242 may rotate. In this case, when the mop 242 rotates in a state where washing water is supplied to the washing plate 122, the mop 242 may be washed while

rubbing against the washing protrusions 122a in a stationary state.

[0219] The washing tub 128 is a configuration on which the washing plate 122 is seated. The washing tub 128 may be disposed at a rear side of the base body 121a. The washing tub 128 may be disposed below the washing plate 122 and may be detachably coupled with the washing plate 122. The washing tub 128 may be formed to correspond to the washing plate 122 so that the washing plate 122 can be inserted therein. Liquid passing through the washing plate 122 may be introduced into the washing tub 128.

[0220] The washing tub 128 may include a washing tub base surface through which fluid passing through the washing plate 122 flows and a washing tub wall protruding upward from an outer edge of the washing tub base surface in a vertical direction. In this case, the washing tub base surface may have a height from the ground (the floor of the kitchen) that decreases toward a rear side of the station for a robot cleaner 100. Accordingly, the fluid passing through the washing plate 122 may be collected at the rear of the washing tub 128 and may be discharged to the outside through a wastewater inlet 164c to be described later.

DUST COLLECTION UNIT

[0221] FIGS. 12 and 13 are side views for explaining a dust collection unit of a station for a robot cleaner according to an embodiment of the present invention, and FIG. 14 is a cross-sectional view for explaining a dust collection flow path of a station for a robot cleaner according to an embodiment of the present invention.

[0222] The dust collection unit 140 will be described with reference to FIGS. 12 to 14 and FIG. 17 as follows.

[0223] The dust collection unit 140 may collect dust from the dust bin 220 of the robot cleaner 200. The dust collection unit 140 may be disposed inside the housing 110. The dust collection unit 140 may be disposed outside the seating unit 120. In this case, the accommodation space S may be disposed inside the seating unit 120.

[0224] The dust collection unit 140 may include a dust collection unit housing 141, a dust bag (not shown), a filter 142, and a dust bag drawer 144.

[0225] The dust collection unit housing 141 may form a space therein capable of accommodating the dust bag (not shown), the filter 142, and the dust bag drawer 144.

[0226] The dust bag drawer 144 is coupled to the dust collection unit housing 141 so as to be pulled out, and the dust bag (not shown) may be stored inside the dust bag drawer 144. For example, the dust collection unit housing 141 may be formed in a rectangular tube shape with an open front, and a rear internal space thereof may be in fluid communication with a first dust collection flow path 147 and a second dust collection flow path 148.

[0227] One side of an interior of the dust collection unit housing 141 may communicate with the first dust collection flow path 147, and the other side thereof may com-

municate with the second dust collection flow path 148. In addition, when the dust bag (not shown) is coupled to the dust collection unit housing 141, the dust bag (not shown) may communicate with the first dust collection flow path 147 inside the dust collection unit housing 141.

[0228] The dust bag (not shown) may refer to a dust envelope for collecting dust suctioned from the interior of the dust bin 220 of the robot cleaner 200 by the dust collection motor 145. The dust bag (not shown) may be detachably coupled to the dust collection unit housing 141. Accordingly, the dust bag (not shown) may be separated from the dust collection unit housing 141 and discarded, and a new dust bag (not shown) may be coupled to the dust collection unit housing 141. That is, the dust bag (not shown) may be defined as a consumable part.

[0229] The dust bag (not shown) may be provided such that, when suction force is generated by the dust collection motor 145, a volume thereof increases and dust is received therein.

[0230] To this end, the dust bag (not shown) may be made of a material that is permeable to air but impermeable to foreign substances such as dust. For example, the dust bag (not shown) may be made of a non-woven fabric material, and may have a hexahedral shape corresponding to the shape of the dust collection unit housing 141 when the volume thereof is increased.

[0231] The filter 142 may be disposed between the dust collection unit housing 141 and the second dust collection flow path 148. The filter 142 may be disposed at the outlet 141b. The filter 142 may be a pre-filter or a HEPA filter. Air that has passed through the dust bag (not shown) may be introduced into the second dust collection flow path 148 through the filter 142.

[0232] The dust bag drawer 144 is coupled to the dust collection unit housing 141 so as to be pulled out, and the dust bag (not shown) may be accommodated therein.

[0233] Referring to FIG. 17, the dust bag drawer 144 includes a dust bag drawer body 144a, a handle 144d, and a drawer rail 144e.

[0234] The dust bag drawer body 144a may provide a space capable of coupling the dust bag (not shown) therein. For example, the dust bag drawer body 144a may be formed in a box shape with an open top, and an inlet 144b and an outlet 144c may be formed at a rear thereof so as to be in fluid communication with the first dust collection flow path 147 and the second dust collection flow path 148.

[0235] For example, the dust bag drawer body 144a may be formed such that a width in a left-right direction at an upper side is different from a width in the left-right direction at a lower side. For example, the width in the left-right direction at the upper side of the dust bag drawer body 144a may be formed to be larger than the width in the left-right direction at the lower side. That is, an interior of the dust bag drawer body 144a may be formed to be stepped. Through this, an upper space in which the dust bag (not shown) is provided can be maximized, and a flow

path can be formed to facilitate air that has passed through the dust bag (not shown) to escape downward.

[0236] The upper side of the dust bag drawer body 144a may be in fluid communication with the first dust collection flow path 147 through the inlet 144b. The inlet 144b may be configured to guide air flowing through the first dust collection flow path 147 into the dust bag (not shown). The inlet 144b may communicate the first dust collection flow path 147 with the dust bag (not shown). Accordingly, dust suctioned from the dust bin 220 of the robot cleaner 200 may move into the dust bag (not shown) via the first dust collection flow path 147 and the inlet 144b.

[0237] The dust bag drawer 144 may be in fluid communication with the second dust collection flow path 148 through the outlet 144c formed at a lower side of a side surface thereof. The outlet 144c may be configured to guide air that has passed through the dust bag drawer 144 to the second dust collection flow path 148. The outlet 144c may be disposed at a different height from the inlet 144b. The outlet 144c may be disposed lower than the inlet 144b. The outlet 144c may communicate the internal space of the dust bag drawer 144 with the second dust collection flow path 148. Accordingly, air from which dust has been filtered while passing through the dust bag (not shown) may move to the second dust collection flow path 148 via the outlet 144c.

[0238] A handle 144d may be provided at a front of the dust bag drawer body 144a. The handle 144d may be provided to be grippable by a user. For example, the handle 144d may include a pair of coupling parts hinged to a front surface of the dust bag drawer body 144a, and a grippable portion formed to be grippable by the user by connecting the pair of coupling parts.

[0239] With such a configuration, when the user grips the grippable portion and pulls it forward, the dust bag drawer body 144a may be pulled forward and pulled out together. Accordingly, according to the present invention, the user can easily pull the dust bag drawer 144 forward, and then the dust bag (not shown) can be lifted upward to be removed and replaced.

[0240] Drawer rails 144e may be formed on left and right side surfaces of the dust bag drawer body 144a. The drawer rails 144e may guide movement of the dust bag drawer body 144a.

[0241] For example, the drawer rails 144e may be formed in a shape of a groove or a rib along a front-rear direction on the left and right side surfaces of the dust bag drawer body 144a.

[0242] With such a configuration, when the user couples the dust bag drawer 144 to the dust collection unit housing 141, it can be coupled to a correct position, and the dust collection unit 140 can be connected to the first dust collection flow path 147 and the second dust collection flow path 148 at the correct position, thereby reducing flow loss.

[0243] Meanwhile, rails 141a may also be formed on an inner surface of the dust collection unit housing 141 to

correspond to the drawer rails 144e. The rails 141a of the dust collection unit housing 141 may be formed to correspond to a shape and a position of the drawer rails 144e. For example, if the drawer rails 144e are formed in a groove shape, the rails 141a of the dust collection unit housing 141 may be formed in a shape of a rib or a stepped portion.

[0244] The station for a robot cleaner 100 may include the dust collection flow path. The dust collection flow path may refer to a flow path through which air suctioned through the dust passage hole 123a flows via the dust bag to reach the dust collection motor 145.

[0245] Specifically, the dust collection flow path may include a first dust collection flow path 147 that communicates the dust bin 220 with an inner space of the dust collection unit housing 141 when the robot cleaner 200 is docked with the station for a robot cleaner 100 and the dust passage hole 123a communicates with the dust bin 220 of the robot cleaner 200, and a second dust collection flow path 148 that communicates the inner space of the dust collection unit housing 141 with the dust collection motor 145.

[0246] The first dust collection flow path 147 may connect the dust bin 220 of the robot cleaner 200 to the inner space of the dust collection unit housing 141. The first dust collection flow path 147 may be in fluid communication with the dust bin 220 of the robot cleaner 200 and the inner space of the dust collection unit housing 141. The first dust collection flow path 147 may connect the dust passage hole 123a of the seating unit 120 to the inner space of the dust collection unit housing 141. The first dust collection flow path 147 may refer to a space between the dust bin 220 of the robot cleaner 200 and the dust collection unit housing 141. The first dust collection flow path 147 may be formed to be close to a horizontal direction. The first dust collection flow path 147 may be a space formed rearward from the dust passage hole 123a, and may be a flow path formed by being bent toward a side from the dust passage hole 123a so that dust and air can flow therethrough. Dust in the dust bin 220 of the robot cleaner 200 may move to the inner space of the dust collection unit housing 141 through the first dust collection flow path 147.

[0247] The second dust collection flow path 148 may connect the inner space of the dust collection unit housing 141 to the dust collection motor 145. The second dust collection flow path 148 may be formed to be close to a horizontal direction. In this case, the first dust collection flow path 147 and the second dust collection flow path 148 may be formed at different heights. The first dust collection flow path 147 and the second dust collection flow path 148 may be formed in a stacked structure. The second dust collection flow path 148 may be disposed lower than the first dust collection flow path 147. With such a configuration, a width in a left-right direction and an overall volume of the station for a robot cleaner 100 can be minimized.

[0248] A dust collection module may provide a suction

air current to the dust collection flow path.

[0249] Specifically, the dust collection module may include a dust collection motor housing 146 and a dust collection motor 145.

5 **[0250]** The dust collection motor housing 146 may be disposed inside the housing 110. The dust collection motor housing 146 may accommodate the dust collection motor 145 therein.

10 **[0251]** An internal space of the dust collection motor housing 146 may be in fluid communication with the second dust collection flow path 148. Accordingly, air flowing through the second dust collection flow path 148 may be guided to the dust collection motor 145.

15 **[0252]** An inner space of the dust collection motor housing 146 may communicate with the circulation flow path. Accordingly, air passing through the dust collection motor 145 may be guided to the circulation flow path.

[0253] The dust collection motor 145 may generate suction force in the dust collection flow path.

20 **[0254]** The dust collection motor 145 may be disposed at a rear side of the dust collection unit housing 141. Through this, the dust collection motor 145 may provide suction force capable of suctioning dust in the dust bin 220 of the robot cleaner 200.

25 **[0255]** The dust collection motor 145 may generate suction force by rotation. For example, the dust collection motor 145 may be formed in a shape similar to a cylinder.

30 **[0256]** One side of the dust collection motor 145 may be connected to the second dust collection flow path 148, and the other side thereof may be connected to the circulation flow path. When the dust collection motor 145 is driven, air flowing through the second dust collection flow path 148 may be introduced into the interior of the dust collection motor housing 146. In addition, the air introduced into the interior of the dust collection motor housing 146 may be exhausted through the outlet hole 151b after passing through the dust collection motor 145. In addition, air introduced into the dust collection motor housing 146 may pass through the dust collection motor 145 and then flow through the circulation flow path and be exhausted through the air return port 125b.

35 **[0257]** Meanwhile, a rotating shaft of the dust collection motor 145 may be formed to be close to a horizontal direction. With such a configuration, an overall volume of the station for a robot cleaner 100 disposed in the mounting space 21a of the kitchen cabinet 2 or the structure can be minimized.

40 **[0258]** An exhaust unit 125 may guide the air discharged from the dust collection motor 145 to the outside of the housing 110. The exhaust unit 125 may communicate an internal space of the housing 110 with an external space thereof.

45 **[0259]** Meanwhile, according to an embodiment, a rotating shaft of the dust collection motor 145 may be disposed along a vertical direction. In this case, a horizontal space occupied by the dust collection motor 145 may be minimized.

50 **[0260]** The air return unit 125 may guide air discharged

from the dust collection motor 145 to the robot cleaner 200.

[0261] The air return unit 125 may include a circulation flow path and an air return port 125b.

[0262] The circulation flow path may provide a flow path through which air discharged from the dust collection motor 145 flows. The circulation flow path may be disposed inside the base body 121a.

[0263] The circulation flow path may be a flow path formed along a horizontal direction inside the housing 110. The circulation flow path may be fluidly connected to the dust collection motor 145. Specifically, one end of the circulation flow path may communicate with an inner space of the dust collection motor housing 146, and the other end of the circulation flow path may communicate with the air return port 125b.

[0264] The air return port 125b may serve as an outlet guiding air discharged from the dust collection motor 145 to an accommodating space of the recess 121da.

[0265] The air return port 125b may be formed in the base 121. The air return port 125b may be formed in the agitator accommodating portion 121d. The air return port 125b may be formed in a side wall of the recess 121da.

[0266] The circulation flow path according to an embodiment of the present invention may guide air discharged from the dust collection motor 145 to the suction port 211 of the robot cleaner 200.

[0267] The circulation flow path may guide the air discharged from the dust collection motor 145 to the suction port 211 of the robot cleaner 200 without discharging the air to the outside, thereby creating a circulating structure in which the air continuously circulates between the robot cleaner 200 and the station for a robot cleaner 100. Accordingly, heat discharged from the dust collection motor 145 is not discharged to the kitchen cabinet 2 but is reintroduced into the robot cleaner 200 and circulated, thereby preventing the interior of the kitchen cabinet 2 from being damaged.

[0268] Air that has passed through the dust collection motor 145 is discharged to the accommodation space S through the air discharge port 125b, and the air discharged to the accommodation space S may be introduced back into the suction port 211 due to suction force of the dust collection motor 145. Accordingly, the air suctioned from the dust bin 220 by the suction force of the dust collection motor 145 may flow through the dust passage hole 123a, the first dust collection flow path 147, the dust collection unit housing 141, the second dust collection flow path 148, the dust collection motor 145, the circulation flow path, and the air discharge port 125b in order, and then be discharged to the accommodation space S.

[0269] In this case, the dust collection motor 145 may be driven together when a suction motor (not shown) of the robot cleaner 200 is driven. Since the air exhausted through the air discharge port 125b is suctioned into the suction port 211 by the suction force of the suction motor (not shown) in addition to the dust collection motor 145,

there is an effect of improving dust collection efficiency.

MOP WASHING UNIT

[0270] FIG. 15 is an enlarged view for explaining a mop washing unit of a station for a robot cleaner according to an embodiment of the present invention, FIG. 16 is an enlarged view for explaining a washing water supply unit of the mop washing unit of a station for a robot cleaner according to an embodiment of the present invention, and FIG. 17 is a view showing a state in which a dust collection unit and a detergent container are pulled out from the station for a robot cleaner according to an embodiment of the present invention.

[0271] The mop washing unit 160 of the station for a robot cleaner 100 according to an embodiment of the present invention will be described with reference to FIGS. 15 to 17 as follows.

[0272] The station for a robot cleaner 100 according to an embodiment of the present invention may include a mop washing unit 160. The mop washing unit 160 may wash the mop 242 of the robot cleaner 200 docked with the seating unit 120.

[0273] The mop washing unit 160 may include a washing water supply unit 161 for discharging washing water to the washing plate 122, a detergent container 163 in which liquid containing detergent is stored, and a wastewater container 164 in which washing water used after washing the mop 242 is stored.

[0274] In the washing water supply unit 161, fresh water and detergent may be mixed to generate washing water for washing the mop 242.

[0275] The washing water supply unit 161 may include a branch flow path 161a, a fresh water inlet 161b, a detergent inlet 161c, a detergent pump 161d, and a washing water discharge port 161e.

[0276] In this case, a pair of washing water discharge ports 161e may be disposed to be spaced apart from each other at a rear side of the coupling wall 123. The washing water discharge ports 161e may discharge washing water toward the washing plate 122 from above the washing plate 122. For example, the pair of washing water discharge ports 161e may be disposed above the pair of washing protrusions 122a.

[0277] In this case, fresh water supplied from a water supply pipe of the kitchen cabinet 2 and having passed through a regulator 162 may be branched to both sides through a branch flow path 161a and connected to each of the spaced apart washing water discharge port 161e. That is, the branch flow path 161a may be formed in a shape in which one pipe is branched into two, and in this case, one branched end may be connected to any one of the pair of washing water discharge port 161e, and the other branched end may be connected to the other one of the pair of washing water discharge port 161e. Accordingly, the branch flow path 161a may supply washing water to the pair of washing water discharge ports 161e.

[0278] The washing water discharge ports 161e may

be formed integrally with the coupling wall 123 at the rear side of the coupling wall 123, or may be detachably coupled to the coupling wall 123.

[0279] The fresh water inlet 161b is configured to guide fresh water supplied from the water supply pipe of the kitchen cabinet 2 to the washing water supply unit 161. Specifically, the water supply pipe of the kitchen cabinet 2 is connected to the regulator 162 so that a flow rate supplied from the water supply pipe can be adjusted. In addition, a portion of the fresh water having passed through the regulator 162 may be supplied to the water tank 230 of the robot cleaner 200 through the water supply nozzle 123c, and the remainder may be introduced into the pair of washing water supply units 161 spaced apart from each other through the fresh water inlet 161b.

[0280] The detergent inlet 161c is configured to guide the liquid containing detergent supplied from the detergent container 163 to the washing water supply unit 161. Specifically, the liquid containing detergent stored in the detergent container 163 may be supplied to the washing water supply unit 161 through a detergent supply pump 161d.

[0281] In addition, the detergent and fresh water introduced into the washing water supply unit 161 may be mixed and utilized as washing water. The washing water supply unit 161 may discharge the washing water to an upper surface of the washing plate 122 through the washing water discharge port 161e. The washing water discharge port 161e may be opened in a direction facing an upper surface of the mop 242 seated on the washing plate 122.

[0282] The detergent container 163 may store liquid containing detergent.

[0283] The detergent container 163 includes a detergent container body 163a, a handle 163b, and detergent container rails 163c.

[0284] The detergent container body 163a may provide a space capable of storing liquid containing detergent. For example, the detergent container body 163a may be formed in a box shape with an open top, and a rear thereof may be connected to the washing water supply unit 161.

[0285] A handle 163b may be provided at a front of the detergent container body 163a. The handle 163b may be provided to be grippable by a user. For example, the handle 163b may include a pair of coupling parts hinged to a front surface of the detergent container body 163a, and a grippable portion formed to be grippable by the user by connecting the pair of coupling parts.

[0286] With such a configuration, when the user grips the grippable portion and pulls it forward, the detergent container body 163a may be pulled forward and pulled out together. Accordingly, according to the present invention, the user can easily pull the detergent container 163 forward and then supply detergent.

[0287] The detergent container rails 163c may be formed on left and right side surfaces of the detergent

container body 163a. The detergent container rails 163c may guide movement of the detergent container body 163a.

[0288] For example, the detergent container rails 163c may be formed in a shape of a groove or a rib along a front-rear direction on the left and right side surfaces of the detergent container body 163a.

[0289] With such a configuration, when the user couples the detergent container 163 to the housing 110, it can be coupled to a correct position, and leakage of washing water can be prevented.

[0290] Meanwhile, although not shown, rails may be formed in the housing 110 to correspond to the detergent container rails 163c. The aforementioned rails may be formed to correspond to a shape and a position of the detergent container rails 163c.

[0291] The wastewater container 164 may provide a space in which washing water used to wash the mop 242 is stored. Washing water discharged onto an upper surface of the washing plate 122 may be drained through the passage holes 122b while descending along a slope of the washing plate 122 after washing of the mop 242 is completed. The washing water passing through the passage holes 122b may be collected in the washing tub 128. In addition, the washing water collected in the washing tub 128 may be introduced into a wastewater suction flow path 164b through a wastewater inlet 164c and may be introduced into the wastewater container 164 after passing through the wastewater suction flow path 164b. That is, liquid passing through the washing plate 122 may flow along the washing tub 128 and may be discharged through the wastewater inlet 164c.

[0292] Meanwhile, the wastewater suction flow path 164b may be formed in a wastewater suction pipe, and one end of the wastewater suction pipe may be formed with the wastewater inlet 164c, and the other end of the wastewater suction pipe may communicate with the wastewater container 164. In this case, the wastewater suction pipe may be disposed to pass below the external air supply module 171. That is, the wastewater suction flow path 164b may be disposed below the external air supply module 171. In addition, the wastewater suction flow path 164b may be disposed below the external air supply flow path 171a.

[0293] The washing water stored in the wastewater container 164 may be drained to the drainage pipe 25 of the kitchen cabinet 2 through a wastewater discharge flow path 164a. One end of the wastewater discharge flow path 164a may be connected to the wastewater container 164, and the other end thereof may be connected to the drainage pipe. In this case, the washing water stored in the wastewater container 164 may flow through the wastewater discharge flow path 164a by a centrifugal pump (not shown) and be drained to the drainage pipe 25.

[0294] The wastewater discharge flow path 164a connected to the wastewater container 164 may be connected to an upstream 25b with respect to the U-trap

25a of the drainage pipe 25 of the kitchen cabinet 2. This is because, if the wastewater discharge flow path 164a is connected to a downstream 25c with respect to the U-trap 25a of the drainage pipe 25, odors or fluid inside the drainage pipe 25 may backflow into the wastewater discharge flow path 164a.

[0295] In addition, the mop washing unit 160 may include a check valve (not shown). The check valve may prevent the fluid inside the drainage pipe 25 from flowing back into the wastewater discharge flow path 164a. The check valve may be provided at the other end of the wastewater discharge flow path 164a connected to the drainage pipe 25.

[0296] Meanwhile, the detergent container 163 and the wastewater container 164 may be accommodated in a space formed between the inner wall 124 and the outer wall 111 of the housing. The detergent container 163 may be disposed at a lower side of the space between the inner wall 124 and the outer wall 111 of the housing, and the wastewater container 164 may be disposed above the detergent container 163 in the space between the inner wall 124 and the outer wall 111 of the housing.

MOP DRYING UNIT

[0297] Meanwhile, FIG. 18 is a perspective view for explaining a mop drying unit of a station for a robot cleaner according to an embodiment of the present invention, FIG. 19 is an enlarged view of the mop drying unit of a station for a robot cleaner according to an embodiment of the present invention, and FIG. 20 is a cross-sectional view for explaining a state in which air flows into an external air supply module according to an embodiment of the present invention.

[0298] Referring to FIGS. 18 to 20, the station for a robot cleaner 100 according to an embodiment of the present invention may include a mop drying unit 170. In this case, the mop drying unit 170 may dry the mop 242 of the robot cleaner 200 that has been washed by the mop washing unit 160 or the mop 242 in a wet state after a water cleaning operation is completed.

[0299] The mop drying unit 170 according to an embodiment of the present invention may include an external air supply module 171, an air discharge unit 172, an exhaust fan 173, and a check valve 175.

[0300] The external air supply module 171 may supply hot air to the accommodation space S and may include an external air supply flow path 171a, an external air inlet 171b, an external air discharge portion 171c, a heater 171d, and a blowing fan 171e.

[0301] An external air supply flow path 171a may be formed in the external air supply module 171. The external air supply flow path 171a may allow external air to flow to the external air discharge portion 171c.

[0302] The external air supply flow path 171a may connect an external space of the housing 110 and the accommodation space S. One side of the external air supply flow path 171a may communicate with the exter-

nal space through the external air inlet 171b, and the other side of the external air supply flow path 171a may communicate with the accommodation space S through the external air discharge portion 171c.

5 [0303] The external air inlet 171b may be formed on a rear side surface of the housing 110. A plurality of external air inlets 171b may be formed on the rear side surface of the housing 110. Air outside the housing 110 may be introduced into the external air supply flow path 171a through the external air inlets 171b. Accordingly, air outside the housing 110 may be introduced into the interior of the housing 110.

10 [0304] At least a portion of the external air discharge portion 171c may be disposed above the washing plate 122. The external air discharge portion 171c may be opened in a direction facing the washing plate 122. The external air discharge portions 171c may be provided as a pair in a state of being opened downward.

15 [0305] The external air discharge portion 171c may discharge air that has passed through the external air supply flow path 171a. The external air discharge portion 171c may discharge air heated by the heater 171d. For example, an external air discharge port may be formed in the external air discharge portion 171c.

20 [0306] In a state where the mop 242 is seated on the washing plate 122, the external air discharge portion 171c may be opened toward an upper surface of the mop 242. Accordingly, the external air discharge portion 171c may be positioned adjacent to the mop 242 and opened downward so that air discharged from the external air discharge portion 171c may flow toward the mop 242.

25 [0307] The blowing fan 171e may be disposed on the external air supply flow path 171a and may blow air toward the accommodation space S. When the blowing fan 171e is driven, air introduced through the external air inlet 171b may be heated by the heater 171d and discharged to the accommodation space S through the external air discharge portion 171c.

30 [0308] The heater 171d may be disposed on the external air supply flow path 171a and may heat air flowing through the external air supply flow path 171a. The heater 171d may heat air discharged through the external air discharge portion 171c.

35 [0309] The heater 171d may include a heater housing and a heating element. In this case, the heater housing may be disposed on the external air supply flow path 171a and may provide a space in which the heating element may be accommodated. The heating element may heat air introduced into the heater housing. Accordingly, air heated by the heating element may be discharged to the accommodation space S through the external air discharge portion 171c to dry the wet mop 242.

40 [0310] The air discharge unit 172 may discharge high-temperature and high-humidity air inside the station for a robot cleaner 100 generated while drying the mop 242 to the drainage pipe 25. Specifically, the air discharge unit

172 may connect the accommodation space S and the drainage pipe 25 of the kitchen cabinet 2.

[0311] An air discharge flow path may be formed in the air discharge unit 172. One end of the air discharge flow path may be connected to the accommodation space S, and the other end may be connected to the drainage pipe 25. Specifically, an air inlet 172a, which is one end of the air discharge flow path, may be connected to the accommodation space S, and an air outlet 172b, which is the other end, may be connected to the drainage pipe 25.

[0312] Meanwhile, the air inlet 172a may be disposed at various positions in the accommodation space S. For example, the air inlet 172a may be disposed on the coupling wall 123. In another example, the air inlet 172a may be disposed on the inner wall 124. In still another example, the air inlet 172a may be disposed higher than the mop 242 from the ground and disposed in front of the external air discharge portion 171c. Through this configuration, air containing vapor generated during drying of the mop 242 may be discharged.

[0313] The air discharge unit 172 may be connected to a downstream side 25c of a U-trap 25a of the drainage pipe 25 of the kitchen cabinet 2. This is because, when the air discharge unit 172 is connected to an upstream side 25b of the U-trap 25a of the drainage pipe 25, hot air exhausted through the air discharge unit 172 may not pass through the drainage pipe 25 due to water accumulated in the U-trap 25a.

[0314] Meanwhile, according to an embodiment of the present invention, the air discharge flow path may be branched into two pipes inside the housing 110 and may pass through both sides of the housing 110. In this case, one branched pipe may pass through a left outer wall surface of the housing 110 and the other branched pipe may pass through a right outer wall surface of the housing 110. The air discharge unit 172 passing through the outer walls 111 on both sides of the housing 110 may be connected to the drainage pipe 25. Accordingly, air sucked into the air discharge unit 172 may flow through the branched air outlets 172b and may be exhausted to the downstream side 25c of the U-trap 25a of the drainage pipe 25.

[0315] The exhaust fan 173 may exhaust air introduced through the air inlet 172a to the drainage pipe 25. The exhaust fan 173 may generate airflow in air introduced into the air discharge unit 172. The exhaust fan 173 may be disposed on the air discharge flow path.

[0316] When the exhaust fan 173 is driven, air in the accommodation space S may be introduced into the air inlet 172a. Air introduced into the air inlet 172a may flow through the air discharge unit 172 and may be exhausted to the drainage pipe 25. Specifically, air flowing through the air discharge unit 172 when the exhaust fan 173 is driven may be exhausted to the downstream side 25c of the U-trap 25a of the drainage pipe 25.

[0317] The mop drying unit 170 may include a check valve 175. The check valve 175 may be provided at the other end of the air discharge flow path connected to the

drainage pipe 25. Accordingly, fluid inside the drainage pipe 25 may be prevented from flowing backward into the air discharge unit 172.

5 LAYOUT

[0318] FIGS. 21 and 22 are front views for explaining an arrangement relationship on a horizontal plane of the station for a robot cleaner according to an embodiment of the present invention.

[0319] The arrangement of the station for a robot cleaner 100 according to an embodiment of the present invention will be described with reference to FIGS. 4, 21 and 22 as follows.

[0320] The station for a robot cleaner 100 according to an embodiment of the present invention is characterized by being installed in a lower space of a kitchen cabinet 2.

[0321] To this end, the station for a robot cleaner 100 according to an embodiment of the present invention is characterized by being arranged along a horizontal direction in accordance with a space formed between the lower plate 23 of the kitchen cabinet 2 and a floor of a kitchen.

[0322] Specifically, in the station for a robot cleaner 100 according to an embodiment of the present invention, the dust collection unit 140 and/or the mop washing unit 160 may be disposed at a side of the entrance 127.

[0323] In this case, when both the dust collection unit 140 and the mop washing unit 160 are provided, the seating unit 120 may be disposed between the dust collection unit 140 and the mop washing unit 160.

[0324] For example, the entrance 127 and the door 126 may be disposed at a front of the station for a robot cleaner 100. Further, the seating unit 120, to which the robot cleaner 200 is coupled, may be disposed rearward from the entrance 127. In this case, the dust collection unit 140 may be disposed from a front end of the station for a robot cleaner 100 to a rear side by a predetermined length. In addition, the mop washing unit 160 may also be disposed from the front end of the station for a robot cleaner 100 to the rear side by a predetermined length.

[0325] Accordingly, when looking at the station for a robot cleaner 100 from a front outside of the station for a robot cleaner 100, the front end of the dust collection unit 140 and/or the front end of the mop washing unit 160 may be disposed on left and right sides of the entrance 127.

[0326] In this case, a dust bag (not shown) of the dust collection unit 140 may be provided to be pulled out toward the front of the housing 110. In addition, the detergent container 163 of the mop washing unit 160 may be provided to be pulled out toward the front of the housing 110.

[0327] That is, a handle 144d for a user to grip the dust collection unit housing 141 may be provided at the front end of the dust collection unit 140. In addition, a handle 163b for pulling the detergent container 163 may also be provided at the front end of the mop washing unit 160.

[0328] With such a configuration, when the user in-

tends to pull out the dust bag (not shown) or the detergent container 163, the user can immediately recognize a pull-out position, and convenience can be provided in that the dust bag (not shown) or the detergent container 163 can be pulled out through a simple operation of pulling the handle.

[0329] Meanwhile, a rear end of the dust collection unit housing 141 and a rear end of the detergent container 163 may be disposed to be spaced apart from a rear end of the housing 110 by a predetermined distance. In addition, the dust collection motor 145 may be disposed between the rear end of the dust collection unit housing 141 and the rear end of the housing 110. With such a configuration, connection of a power line supplying power to the dust collection motor 145 may be facilitated. In addition, an overall space occupied by the seating unit 120, the dust collection unit housing 141, and the dust collection motor 145 may be minimized within a limited space.

[0330] In addition, at least a portion of a flow path through which washing water for washing the mop 242 flows and a pump providing flow force of the washing water may be disposed between the rear end of the housing 110 and the rear end of the detergent container 163. With such a configuration, a path through which washing water is introduced from a water supply pipe may be minimized in length. In addition, an overall space occupied by the seating unit 120, the detergent container 163, and the flow path through which the washing water flows may be minimized within a limited space.

[0331] Meanwhile, in the station for a robot cleaner 100, the mop drying unit 170 may be disposed rearward of the seating unit 120. In this case, the mop drying unit 170 may be disposed between the rear end of the seating unit 120 and the rear end of the housing 110.

[0332] Accordingly, in the station for a robot cleaner 100 according to an embodiment of the present invention, the dust collection unit 140 and the mop washing unit 160 may be disposed on left and right sides with respect to the seating unit 120, and the mop drying unit 170 may be disposed at a rear side thereof.

[0333] That is, in the station for a robot cleaner 100 according to an embodiment of the present invention, the dust collection unit 140, the mop washing unit 160, and the mop drying unit 170 may all be disposed within a predetermined distance range from an outer periphery of the seating unit 120.

[0334] Through such an arrangement, there is an effect that the seating unit 120, the dust collection unit 140, the mop washing unit 160, and the mop drying unit 170 can all be arranged within the narrowest space on a horizontal plane.

[0335] This makes the distance between the dust bin 220 of the robot cleaner 200 and the dust collection unit 140 short, thereby having an effect of minimizing flow loss. In addition, by minimizing the distance between the mop 242 of the robot cleaner 200 and the mop washing unit 160 and the distance between the mop 242 of the

robot cleaner 200 and the mop drying unit 170, there is an effect of limiting a range in which the washing water and the used wastewater exist.

[0336] In addition, by such an arrangement, the station for a robot cleaner 100 of the present invention can arrange all the components within a limited height.

[0337] Specifically, based on a state in which the robot cleaner 200 is docked with the seating unit 120, at least a portion of the dust collection unit 140 may be disposed lower than a topmost end of the robot cleaner 200. In addition, at least a portion of the mop washing unit 160 may be disposed lower than the topmost end of the robot cleaner 200. In addition, at least a portion of the mop drying unit 170 may be disposed lower than the topmost end of the robot cleaner 200.

[0338] In addition, based on the state in which the robot cleaner 200 is docked with the seating unit 120, the topmost end of the robot cleaner 200 may be disposed higher than the dust bag drawer 144. In addition, the topmost end of the robot cleaner 200 may be disposed higher than the detergent container 163. Furthermore, a topmost end of the dust bag drawer 144 may be disposed higher than the detergent container 163.

[0339] As a result, in the station for a robot cleaner 100 according to an embodiment of the present invention, the dust collection unit 140, the mop washing unit 160, and the mop drying unit 170 may be disposed on three sides surrounding the seating unit 120 except for a front surface through which the robot cleaner 200 enters. By such an arrangement, even in a situation where height in the vertical direction is limited, there is an effect of not only charging the robot cleaner 200 but also collecting dust from the robot cleaner 200, washing the mop 242, and drying the mop 242 using a minimum horizontal space.

DRAWER

[0340] When a charging station for a robot cleaner is disposed in a lower portion of a kitchen cabinet, exposure to the outside may be minimized, thereby providing an interior design effect. However, when the robot cleaner breaks down while being located in the lower portion of the kitchen cabinet or when the charging station for the robot cleaner breaks down, there may be a limitation in that it is difficult for a user to pull it out and repair it. To solve this problem, according to the present invention, a drawer 190 may be additionally provided in the station for a robot cleaner 100.

[0341] In this regard, FIG. 23 is a view for explaining a state in which the drawer is provided in the station for a robot cleaner according to an embodiment of the present invention, and FIG. 24 is a view for explaining a state in which the drawer is pulled out from the station for a robot cleaner according to an embodiment of the present invention.

[0342] The drawer 190 of the station for a robot cleaner 100 according to an embodiment of the present invention will be described with reference to FIGS. 23 and 24 as

follows.

[0343] The station for a robot cleaner 100 according to an embodiment of the present invention may further include the drawer 190 that is pulled out from the housing 110.

[0344] When the drawer 190 is inserted into the housing 110, the door 126 may be closed when the robot cleaner 200 enters the seating unit 120. In this case, the robot cleaner 200 may be isolated from an inside and an outside of the housing 110 by the door 126.

[0345] Accordingly, while dust is collected from the dust bin 220 of the robot cleaner 200 inside the housing 110, scattering of dust to the outside of the station for a robot cleaner 100 may be prevented. In addition, leakage of wastewater to the outside of the station for a robot cleaner 100 while washing the mop 242 may be prevented.

[0346] The drawer 190 may move relative to the housing 110. For example, the housing 110 may be fixedly coupled to the kitchen cabinet 2, and the drawer 190 may be pulled out forward from the housing 110.

[0347] In this case, the drawer 190 may be pulled out with the seating unit 120 provided therein. With such a configuration, when the drawer 190 is pulled out, the seating unit 120 and/or the robot cleaner 200 may be pulled out from the kitchen cabinet 2 to the outside.

[0348] At this time, when the drawer 190 is pulled out from the housing 110 while the door 126 closes the entrance 127, the robot cleaner 200 disposed on the seating unit 120 may be exposed to the outside.

[0349] Therefore, according to the present embodiment, when maintenance such as repair or cleaning of the station for a robot cleaner 100 is required, a user may easily pull out the seating unit 120 and/or the robot cleaner 200 through the drawer 190 to expose internal components of the station for a robot cleaner 100 or the robot cleaner 200.

[0350] Meanwhile, according to an embodiment of the present invention, the drawer 190 may be pulled out in a state in which the dust collection unit 140 is provided therein. That is, the drawer 190 may be pulled out together with the dust collection unit 140.

[0351] On the other hand, the dust collection unit 140 according to the present invention may be pulled out from the housing 110 separately from the drawer 190. In this case, a pulling-out direction of the dust collection unit 140 may be parallel to a pulling-out direction of the drawer 190. For example, a pulling-out direction of a dust bag drawer 144 may be parallel to the pulling-out direction of the drawer 190.

[0352] In addition, the drawer 190 according to an embodiment of the present invention may be pulled out in a state in which at least a portion of the mop washing unit 160 is provided therein. That is, the drawer 190 may be pulled out together with at least a portion of the mop washing unit 160. For example, the drawer 190 may be pulled out together with the detergent container 163 and the wastewater container 164.

[0353] On the other hand, the detergent container 163 according to the present invention may be pulled out from the housing 110 separately from the drawer 190. In this case, a pulling-out direction of the detergent container 163 may be parallel to the pulling-out direction of the drawer 190.

[0354] With such a configuration, in the station for a robot cleaner 100 according to an embodiment of the present invention, pulling-out directions of the drawer 190, the dust collection unit 140, and the detergent container 163 may all be parallel to each other.

[0355] Accordingly, a user may easily recognize pulling-out directions of components of the station for a robot cleaner 100 and may easily pull them out to perform repair and maintenance.

[0356] The drawer 190 may include a drawer side wall 191, a fitting portion 192, and a drawer rail 193.

[0357] The drawer side wall 191 may be provided to move relative to an outer wall surface of the housing 110. For example, a pair of drawer side walls 191 may be disposed to face a pair of outer wall surfaces of the housing 110.

[0358] In this case, the pair of drawer side walls 191 may be disposed inward of the station for a robot cleaner 100 relative to the pair of outer wall surfaces of the housing 110. That is, the pair of drawer side walls 191 may be disposed closer to the seating unit 120 than the pair of outer wall surfaces of the housing 110.

[0359] The pair of drawer side walls 191 may be directly connected to the base 121 of the seating unit 120. Alternatively, the pair of drawer side walls 191 may be connected by a drawer base (not shown), and the seating unit 120 may be coupled to an upper side of the drawer base (not shown) so as to move together.

[0360] Meanwhile, the dust collection unit 140 and/or the mop washing unit 160 may be disposed between the drawer side wall 191 and the seating unit 120. That is, based on a state in which the robot cleaner 200 is coupled to the seating unit 120, the dust collection unit 140 and/or the mop washing unit 160 may be disposed between the robot cleaner 200 and the drawer side wall 191.

[0361] With such a configuration, the dust collection unit 140 and the mop washing unit 160 may be arranged using a minimum horizontal space.

[0362] The fitting portion 192 may be provided on the drawer side wall 191, and at least one of a hose and an electric wire may be detachably coupled thereto. For example, the fitting portion 192 may be disposed on the drawer side wall 191, and a hose and/or an electric wire may be coupled thereto.

[0363] The fitting portion 192 may be coupled to the drawer side wall 191, and one side of the fitting portion 192 may be disposed in an inner space of the drawer 190 relative to the drawer side wall 191, and the other side of the fitting portion 192 may be disposed outside the drawer side wall 191.

[0364] At least one of a hose and an electric wire may be detachably coupled to the fitting portion 192. For

example, the fitting portion 192 may detachably couple at least one of a water supply pipe connection portion to which a water supply pipe is connected, a drainage pipe connection portion to which a drainage pipe is connected, an exhaust pipe connection portion to which a vapor discharge pipe through which air inside the drawer 190 is discharged is connected, and a power connection portion to which power is connected.

[0365] At this time, on both sides of the water supply pipe connection portion, a water supply pipe of the mop washing unit 160 and a water supply pipe connected from an external water supply source may be respectively connected. In addition, on both sides of the drainage pipe connection portion, a drainage pipe of the mop washing unit 160 and a drainage pipe connected to an upstream side 25b of the U-trap of the kitchen cabinet 2 may be respectively connected.

[0366] That is, the fitting portion 192 according to the present invention may provide a structure that detachably connects water supply pipes and drainage pipes used for direct drainage using a water supply source and drainage pipe provided in the kitchen cabinet 2 with water supply pipes and drainage pipes inside the station for a robot cleaner 100.

[0367] In addition, air discharge pipes connected from air outlets 172b of the mop drying unit 170 may be respectively connected to both sides of the exhaust pipe connection portion.

[0368] Accordingly, air discharged from the mop drying unit 170 may be exhausted to a downstream side 25c of the U-trap.

[0369] In addition, an electric wire may be coupled to the power connection portion so that external power may be connected. In this case, the electric wire may be directly coupled to the power connection portion, or the electric wire may be connected using a wire connection means such as a connector or an adapter.

[0370] The drawer rail 193 may be disposed on the drawer side wall 191 and may guide movement of the drawer side wall 191. The drawer rail 193 may be fixedly coupled to or integrally formed with the drawer side wall 191 and may be coupled with a rail installed on the outer wall 111 of the housing 110 to guide a movement path of the drawer side wall 191. Meanwhile, although the present invention describes that rails are provided on the drawer 190 and the housing 110, the configuration is not necessarily limited to a rail shape and may include shapes such as rollers, guide grooves, or guide ribs capable of replacing the rails.

CONTROL CONFIGURATION

[0371] FIG. 25 is a block diagram for explaining a control configuration of a station for a robot cleaner according to an embodiment of the present invention.

[0372] A control configuration of the station for a robot cleaner 100 according to the present invention will be described with reference to FIG. 25 as follows.

[0373] The station for a robot cleaner 100 according to an embodiment of the present invention may further include a controller 300 configured to control the seating unit 120, the dust collection motor 145, the mop washing unit 160, and the mop drying unit 170.

[0374] The controller 300 may include a printed circuit board and components mounted on the printed circuit board.

[0375] The controller 300 may detect an approach of the robot cleaner 200 and may control the door driving unit 126a to rotate the door 126. Specifically, when a distance between the robot cleaner 200 and the door 126 becomes smaller than a preset distance, the controller 300 may rotate the door 126 to open the entrance 127. In addition, when the robot cleaner 200 is coupled to the seating unit 120, the controller 300 may rotate the door 126 to close the entrance 127.

[0376] When power is supplied to a battery of the robot cleaner 200 through the power supply terminal 123b, the controller 300 may determine that the robot cleaner 200 is coupled to the seating unit 120.

[0377] The controller 300 may drive the dust collection motor 145 to suck dust inside the dust bin 220 of the robot cleaner 200.

[0378] Meanwhile, the station for a robot cleaner 100 according to an embodiment of the present invention may include a memory (not shown). The memory may store various data for driving and operation of the station for a robot cleaner 100.

[0379] Meanwhile, the station for a robot cleaner 100 according to an embodiment of the present invention may include a communication unit (not shown). The communication unit may support wireless communication with other devices located outside the station for a robot cleaner 100, including the robot cleaner 200 or a terminal (not shown). A short-range communication module or a long-range communication module may be provided as a wireless communication module for supporting wireless communication.

[0380] The short-range communication may include, for example, Bluetooth communication or NFC (Near Field Communication).

[0381] The long-range communication may include, for example, Wireless LAN (WLAN), DLNA (Digital Living Network Alliance), Wibro (Wireless Broadband), Wimax (World Interoperability for Microwave Access), GSM (Global System for Mobile Communication), CDMA (Code Division Multiple Access), CDMA2000 (Code Division Multiple Access 2000), EV-DO (Enhanced Voice-Data Optimized or Enhanced Voice-Data Only), WCDMA (Wideband CDMA), HSDPA (High Speed Downlink Packet Access), HSUPA (High Speed Uplink Packet Access), IEEE 802.16, LTE (Long Term Evolution), LTE-A (Long Term Evolution-Advanced), WMBS (Wireless Mobile Broadband Service), BLE (Bluetooth Low Energy), Zigbee, RF (Radio Frequency), and LoRa (Long Range).

[0382] The controller 300 may control the mop washing

unit 160.

[0383] Specifically, the controller 300 may control the detergent pump 161d. The controller 300 may operate the detergent pump 161d to discharge detergent stored in the detergent container 163 to the mop 242.

[0384] In addition, the controller 300 may control the regulator 162. The controller 300 may operate the regulator 162 to adjust an amount of fresh water discharged to the mop 242.

[0385] In addition, the controller 300 may control a drain pump 168. The controller 300 may operate the drain pump 168 to discharge wastewater after washing the mop 242.

[0386] The controller 300 may control the mop drying unit 170.

[0387] Specifically, the controller 300 may control the heater 171d. The controller 300 may operate the heater 171d to heat air discharged toward the mop 242.

[0388] In addition, the controller 300 may control the blowing fan 171e. The controller 300 may operate the blowing fan 171e to blow air toward the mop 242.

[0389] In addition, the controller 300 may control the exhaust fan 173. The controller 300 may operate the exhaust fan 173 to discharge air after drying the mop 242 to the outside.

[0390] In addition, the controller 300 may receive a signal from a temperature sensor 174. The controller 300 may measure a temperature of air inside the housing 110 based on temperature information received from the temperature sensor 174. The controller 300 may control operation of the heater 171d based on the temperature information received from the temperature sensor 174 to sterilize bacteria present on the mop 242.

ANOTHER EMBODIMENT

[0391] FIG. 26 is a plan view for explaining an air discharge unit of a station for a robot cleaner according to another embodiment of the present invention, and FIGS. 27 and 28 are side views for explaining a path through which air discharged from an external air discharge portion is discharged in the station for a robot cleaner according to another embodiment of the present invention.

[0392] A station for a robot cleaner according to another embodiment of the present invention will be described with reference to FIGS. 26 to 28 as follows.

[0393] To avoid redundant description, except for configurations specifically described in this embodiment, configurations and effects of the station for a robot cleaner according to the previous embodiment may be equally applied.

[0394] A mop drying unit 2170 according to another embodiment of the present invention may include an external air supply module 2171, an air discharge unit 2172, an exhaust fan 2173, and a check valve 2175.

[0395] The external air supply module 2171 may supply hot air to the accommodation space S and may

include an external air supply flow path 2171a, an external air inlet 2171b, an external air discharge portion 2171c, a heater 2171d, and a blowing fan 2171e.

[0396] An external air supply flow path 2171a may be formed in the external air supply module 2171. The external air supply flow path 2171a may allow external air to flow to the external air discharge portion 2171c.

[0397] The external air supply flow path 2171a may connect an external space of the housing 110 and the accommodation space S. One side of the external air supply flow path 2171a may communicate with the external space through the external air inlet 2171b, and the other side of the external air supply flow path 2171a may communicate with the accommodation space S through the external air discharge portion 2171c.

[0398] The external air inlet 2171b may be formed on a rear side surface of the housing 110. A plurality of external air inlets 2171b may be formed on the rear side surface of the housing 110. Air outside the housing 110 may be introduced into the external air supply flow path 2171a through the external air inlets 2171b. Accordingly, air outside the housing 110 may be introduced into the interior of the housing 110.

[0399] At least a portion of the external air discharge portion 2171c may be disposed above the washing plate 122. The external air discharge portion 2171c may be opened in a direction facing the washing plate 122. The external air discharge portions 2171c may be provided as a pair in a state of being opened downward.

[0400] The external air discharge portion 2171c may discharge air that has passed through the external air supply flow path 2171a. The external air discharge portion 2171c may discharge air heated by the heater 2171d. For example, an external air discharge port may be formed in the external air discharge portion 2171c.

[0401] Meanwhile, in the present embodiment, a diameter of the external air discharge portion 2171c in a left-right direction may become narrower toward the front. That is, a width of a rear end of the external air discharge portion 2171c may be larger than a width of a front end thereof. Through this configuration, even when the disc-shaped mop 242 rotates during a drying process, the entire mop 242 may be uniformly dried.

[0402] Meanwhile, a grille for guiding a discharge direction of air may be provided in the external air discharge portion 2171c. Accordingly, heated air may be prevented from being intensively discharged to a specific position.

[0403] In a state where the mop 242 is seated on the washing plate 122, the external air discharge portion 2171c may be opened toward an upper surface of the mop 242. Accordingly, the external air discharge portion 2171c may be positioned adjacent to the mop 242 and opened downward so that air discharged from the external air discharge portion 2171c may flow toward the mop 242.

[0404] In particular, the external air discharge portion 2171c according to the present embodiment may be formed to be inclined downward toward a front side of

the station for a robot cleaner 100. Accordingly, an end portion through which air is discharged from the external air discharge portion 2171c may be formed to be inclined at a predetermined angle with respect to the ground. In this case, the angle may be 90 degrees or less. Accordingly, the external air discharge portion 2171c may discharge air in a direction intersecting a direction in which the flow guide surface 122c is formed.

[0405] Meanwhile, a maximum width of the external air discharge portion 2171c in a left-right direction may be larger than a width of the power supply terminal 123b in the left-right direction.

[0406] The blowing fan 2171e may be disposed on the external air supply flow path 2171a and may blow air toward the accommodation space S. When the blowing fan 2171e is driven, air introduced through the external air inlet 2171b may be heated by the heater 2171d and discharged to the accommodation space S through the external air discharge portion 2171c.

[0407] The heater 2171d may be disposed on the external air supply flow path 2171a and may heat air flowing through the external air supply flow path 2171a. The heater 2171d may heat air discharged through the external air discharge portion 2171c.

[0408] The heater 2171d may include a heater housing and a heating element. In this case, the heater housing may be disposed on the external air supply flow path 2171a and may provide a space in which the heating element may be accommodated. The heating element may heat air introduced into the heater housing. Accordingly, air heated by the heating element may be discharged to the accommodation space S through the external air discharge portion 2171c to dry the wet mop 242.

[0409] Meanwhile, the air discharge unit 2172 according to the present embodiment may discharge high-temperature and high-humidity air generated inside the station for a robot cleaner 100 while drying the mop 242 to the drainage pipe 25. Specifically, the air discharge unit 2172 may connect the accommodation space S and the drainage pipe 25 of the kitchen cabinet 2.

[0410] An air discharge flow path may be formed in the air discharge unit 2172. One end of the air discharge flow path may be connected to the accommodation space S, and the other end may be connected to the drainage pipe 25. Specifically, an air inlet 2172a, which is one end of the air discharge flow path, may be connected to the accommodation space S, and an air outlet 2172b, which is the other end, may be connected to the drainage pipe 25.

[0411] Meanwhile, the air inlet 2172a according to the present embodiment may be disposed at various positions in the accommodation space S. For example, a pair of air inlets 2172a may be disposed higher than the mop 242 from the ground and may be disposed in front of the external air discharge portion 2171c. Accordingly, air containing vapor generated during drying of the mop 242 may be discharged.

[0412] Referring to FIGS. 27 and 28, air discharged

through the external air discharge portion 2171c may flow along the washing plate 122 to dry the mop 242 and then may flow upward and be introduced into the air inlet 2172a.

[0413] Accordingly, vapor generated during drying of the mop 242 may be prevented from remaining inside the station for a robot cleaner 100 and causing failure of components.

[0414] In addition, even when odor is generated as wastewater generated during a washing process of the mop 242 is dried, diffusion of the odor into an indoor space may be prevented.

[0415] The air discharge unit 2172 may be connected to a downstream side 25c of a U-trap 25a of the drainage pipe 25 of the kitchen cabinet 2. This is because, when the air discharge unit 2172 is connected to an upstream side 25b of the U-trap 25a of the drainage pipe 25, hot air exhausted through the air discharge unit 2172 may not pass through the drainage pipe 25 due to water accumulated in the U-trap 25a.

[0416] Meanwhile, the air discharge flow path according to the present embodiment may be formed to include an inner space of the air discharge unit 2172, an inner space of the exhaust fan 2173, and an inner space of the check valve 2175. In this case, one end of the air discharge flow path may communicate with the air inlet 2172a, and the other end may communicate with the air outlet 2172b.

[0417] Meanwhile, the air outlet 2172b according to the present embodiment may be formed at a downstream end of the check valve 2175. In this case, the air outlet 2172b may be formed along a vertical direction and may discharge air upward in the vertical direction. A pipe such as a hose connected to the drainage pipe 25 may be connected to the air outlet 2172b. In this case, the pipe such as the hose may be inserted by selectively passing through one of the outer walls 111 on both sides of the housing 110.

[0418] The exhaust fan 2173 may exhaust air introduced through the air inlet 2172a to the drainage pipe 25. The exhaust fan 2173 may generate airflow in air introduced into the air discharge unit 2172. The exhaust fan 2173 may be disposed on the air discharge flow path.

[0419] When the exhaust fan 2173 is driven, air in the accommodation space S may be introduced into the air inlet 2172a. Air introduced into the air inlet 2172a may flow through the air discharge unit 2172 and may be exhausted to the drainage pipe 25. Specifically, air flowing through the air discharge unit 2172 when the exhaust fan 2173 is driven may be exhausted to the downstream side 25c of the U-trap 25a of the drainage pipe 25.

[0420] The exhaust fan 2173 may be disposed on a side surface of the external air supply module 2171. For example, the exhaust fan 2173 may be disposed between the external air supply module 2171 and the dust collection motor 145. Accordingly, space efficiency in a left-right direction of the station for a robot cleaner 100 may be maximized.

[0421] The mop drying unit 2170 may include the check valve 2175. The check valve 2175 may be provided at the other end of the air discharge flow path connected to the drainage pipe 25. Accordingly, fluid inside the drainage pipe 25 may be prevented from flowing backward into the air discharge unit 2172.

[0422] The check valve 2175 may be disposed at a rear side of the exhaust fan 2173. In addition, the check valve 2175 may be disposed on a side surface of the external air supply module 2171. For example, the check valve 2175 may be disposed between the external air supply module 2171 and the dust collection motor 145.

DRYING OF WASHING TUB BY FLOW OF DRYING AIR

[0423] FIG. 29 is a view illustrating a flow path of air discharged from an external air discharge portion in a station for a robot cleaner according to another embodiment of the present invention, and FIGS. 30 and 31 are views illustrating an arrangement relationship among a washing water supply unit, a washing plate, an external air supply module, and a power supply module in the station for a robot cleaner according to another embodiment of the present invention.

[0424] Referring to FIGS. 29 to 31, in the station for a robot cleaner according to the present invention, a vertically lower side of the external air discharge portion 2171c may be disposed between the pair of washing protrusions 122a.

[0425] Accordingly, air discharged from the external air discharge portion 2171c may be guided by the pair of washing protrusions 122a and the flow guide surface 122c and may flow in a space between the mop 242 and the washing plate 122.

[0426] In this case, a portion of the air discharged from the external air discharge portion 2171c may flow along the washing plate 122 and then flow upward by suction force of the exhaust fan 173 and may be introduced into the air inlet 2172a.

[0427] Meanwhile, another portion of the air discharged from the external air discharge portion 2171c may flow along the washing plate 122 and then may be introduced into the washing tub 128.

[0428] This is because the flow guide surface 122c is formed such that it becomes closer to the ground toward the front from a vertically lower side of the external air discharge portion 2171c toward the passage holes 122b. Accordingly, air discharged from the external air discharge portion 2171c may flow toward the passage holes 122b.

[0429] Air passing through the passage holes 122b may flow downward and may be introduced into the washing tub 128, and may flow toward a rear side of the washing tub 128 along a base surface of the washing tub.

[0430] Accordingly, heated air discharged from the external air discharge portion 2171c may be introduced

into the washing tub 128 and may dry moisture collected in the washing tub 128.

[0431] Accordingly, moisture remaining in the washing tub 128 may be removed to prevent bacteria from proliferating.

[0432] In addition, vapor generated in the washing tub 128 may be discharged to the outside through the air discharge unit 2172.

10 ARRANGEMENT RELATIONSHIP AMONG WASHING WATER SUPPLY UNIT, WASHING PLATE, EXTERNAL AIR SUPPLY MODULE, AND POWER SUPPLY MODULE

15 **[0433]** Referring to FIGS. 20 and 29 to 31, the station for a robot cleaner 100 according to the present invention has the following arrangement relationship.

[0434] The external air supply module 2171 of the present invention may be disposed above the wastewater inlet 164c, the wastewater suction flow path 164b, and the branch flow path 161a.

[0435] Specifically, the wastewater inlet 164c may be disposed below the external air discharge portion 2171c. In addition, the heater 2171d may be disposed above the wastewater suction pipe in which the wastewater suction flow path 164b is formed. Further, the branch flow path 161a may be disposed below the external air supply flow path 171a. Meanwhile, the branch flow path 161a may be disposed farther from the ground than the wastewater suction flow path 164b.

[0436] That is, in the present invention, the wastewater suction flow path 164b, the branch flow path 161a, and the external air supply flow path 171a may be disposed at different heights. Accordingly, a space occupied by the flow paths on a horizontal plane may be minimized.

[0437] Meanwhile, the external air supply module 2171 may be disposed below the power supply module. Specifically, the power supply terminal 123b may be disposed higher from the ground than the external air supply module 2171, and a housing of the power supply module may be disposed above the external air discharge portion 2171c.

[0438] Meanwhile, at least a portion of the external air discharge portion 2171c may be disposed above the washing plate 122. In addition, the wastewater inlet 164c may be disposed below the washing plate 122.

[0439] That is, the wastewater inlet 164c may be disposed above a rear end of the washing tub 128, the washing plate 122 may be disposed above the wastewater inlet 164c, the external air discharge portion 2171c may be disposed above the washing plate 122, and the power supply module may be disposed above the external air discharge portion 2171c.

[0440] As described above, according to the present invention, components for washing the mop 242 and components for drying the mop 242 may be stacked and arranged within a limited left-right space, thereby maximizing space efficiency.

[0441] Although the present invention has been described in detail through specific embodiments, these are for describing the present invention in detail, and the present invention is not limited thereto. It is apparent that modifications or improvements can be made by those of ordinary skill in the art within the technical spirit of the present invention.

[0442] All simple modifications or changes of the present invention fall within the scope of the present invention, and the specific scope of protection of the present invention will be made clear by the appended claims.

Claims

1. A station for a robot cleaner, comprising:

a housing disposed at a lower side of a kitchen cabinet;
a seating unit disposed in the housing and configured to accommodate a robot cleaner; and
a mop drying unit disposed in the housing and configured to dry a mop of the robot cleaner, wherein the seating unit includes:

a washing plate configured to contact the mop in a state in which the robot cleaner is coupled,
wherein the mop drying unit includes:

a heater configured to heat air; and
an external air discharge portion configured to discharge the air heated by the heater,
wherein the washing plate includes:
a flow guide surface formed in a curved shape to guide a flow of air discharged from the external air discharge portion.

2. The station for a robot cleaner of claim 1, wherein the flow guide surface is formed with at least one passage hole through which fluid is allowed to pass.

3. The station for a robot cleaner of claim 2, wherein the flow guide surface is formed such that a height from ground surface increases as the flow guide surface becomes closer to the external air discharge portion from a position where the passage hole is formed.

4. The station for a robot cleaner of claim 2, wherein the washing plate further includes: a washing protrusion protruding from the flow guide surface so as to contact the mop, and the passage hole is formed between the washing protrusions.

5. The station for a robot cleaner of claim 1, wherein at least a portion of the external air dis-

charge portion is disposed above the washing plate.

6. The station for a robot cleaner of claim 5, wherein the washing plate further includes:

washing protrusions protruding from the flow guide surface so as to contact the mop, wherein the washing protrusions are symmetrically arranged as a pair, and wherein a vertically lower side of the external air discharge portion is disposed between the pair of washing protrusions.

7. The station for a robot cleaner of claim 1, wherein the seating unit further includes: a washing tub disposed below the washing plate, detachably coupled with the washing plate, and configured to receive fluid that has passed through the washing plate.

8. The station for a robot cleaner of claim 7, wherein the washing tub includes:

a washing tub base surface along which the fluid passing through the washing plate flows, and the washing tub base surface is formed such that a height from the floor of the kitchen decreases as the washing tub base surface becomes closer to the external air discharge portion.

9. The station for a robot cleaner of claim 2, wherein the external air discharge portion is formed such that a diameter in a left-right direction of an external air discharge port through which air is discharged becomes narrower as the external air discharge portion becomes closer to the passage hole.

10. The station for a robot cleaner of claim 1, wherein the external air discharge portion includes a grille configured to guide a discharge direction of air.

11. A station for a robot cleaner, comprising:

a housing disposed at a lower side of a kitchen cabinet;
a seating unit disposed in the housing and configured to accommodate a robot cleaner;
a mop washing unit configured to wash a mop of the robot cleaner; and
a mop drying unit configured to dry the mop of the robot cleaner,
wherein the mop drying unit includes:

an external air discharge portion configured to discharge air,
wherein the seating unit includes:

a washing plate configured to contact the mop in a state in which the robot cleaner is coupled,
wherein the mop washing unit includes:

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a wastewater inlet configured to discharge liquid that has passed through the washing plate,
and the wastewater inlet is disposed below the external air discharge portion.

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12. The station for a robot cleaner of claim 11,
wherein at least a portion of the external air discharge portion is disposed above the washing plate.

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13. The station for a robot cleaner of claim 11,
wherein the wastewater inlet is disposed below the washing plate.

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14. The station for a robot cleaner of claim 11,
wherein the mop drying unit further includes:

a heater configured to heat air,
wherein the mop washing unit further includes:

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a wastewater suction pipe in which a wastewater suction flow path through which the liquid introduced through the wastewater inlet flows is formed,
and the heater is disposed above the wastewater suction pipe.

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15. The station for a robot cleaner of claim 11,
wherein the mop drying unit further includes:

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an external air supply module in which an external air supply flow path configured to allow external air to flow to the external air discharge portion is formed,
wherein the mop washing unit further includes:
a wastewater suction pipe in which a wastewater suction flow path configured to allow the liquid introduced through the wastewater inlet to flow to a wastewater container is formed,
and the external air supply module is disposed above the wastewater suction pipe.

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16. The station for a robot cleaner of claim 11, further comprising:

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a power supply module including a power supply terminal configured to contact a charging terminal of the robot cleaner and configured to supply power to the robot cleaner,
wherein the mop drying unit includes:

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an external air supply module in which an

external air supply flow path configured to allow external air to flow to the external air discharge portion is formed,
and at least a portion of the power supply module is disposed above the external air supply module.

17. The station for a robot cleaner of claim 11,
wherein the mop drying unit further includes:

an external air supply module in which an external air supply flow path configured to allow external air to flow to the external air discharge portion is formed,
wherein the mop washing unit includes:

a pair of washing water discharge ports configured to discharge washing water to the washing plate; and
a branch flow path configured to supply washing water to the pair of washing water discharge ports,
and at least a portion of the branch flow path is disposed below the external air supply module.

18. The station for a robot cleaner of claim 11,

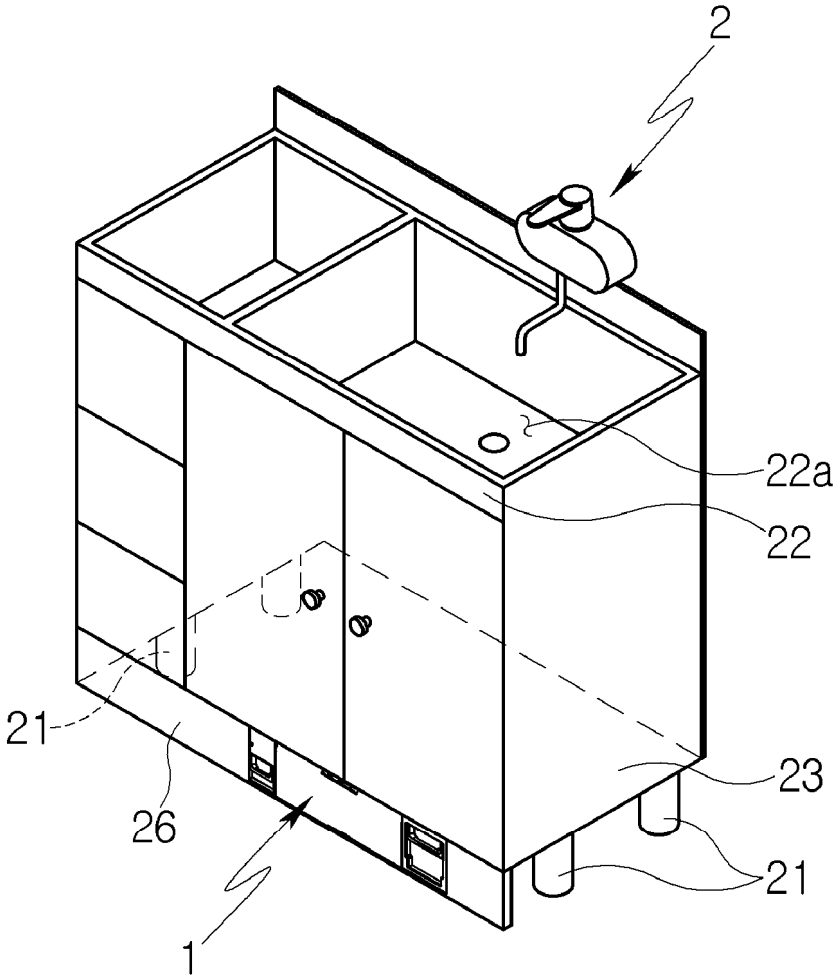
wherein the washing plate includes a flow guide surface formed in a curved shape,
and the external air discharge portion discharges air in a direction intersecting a direction in which the flow guide surface is formed.

19. A station for a robot cleaner, comprising:

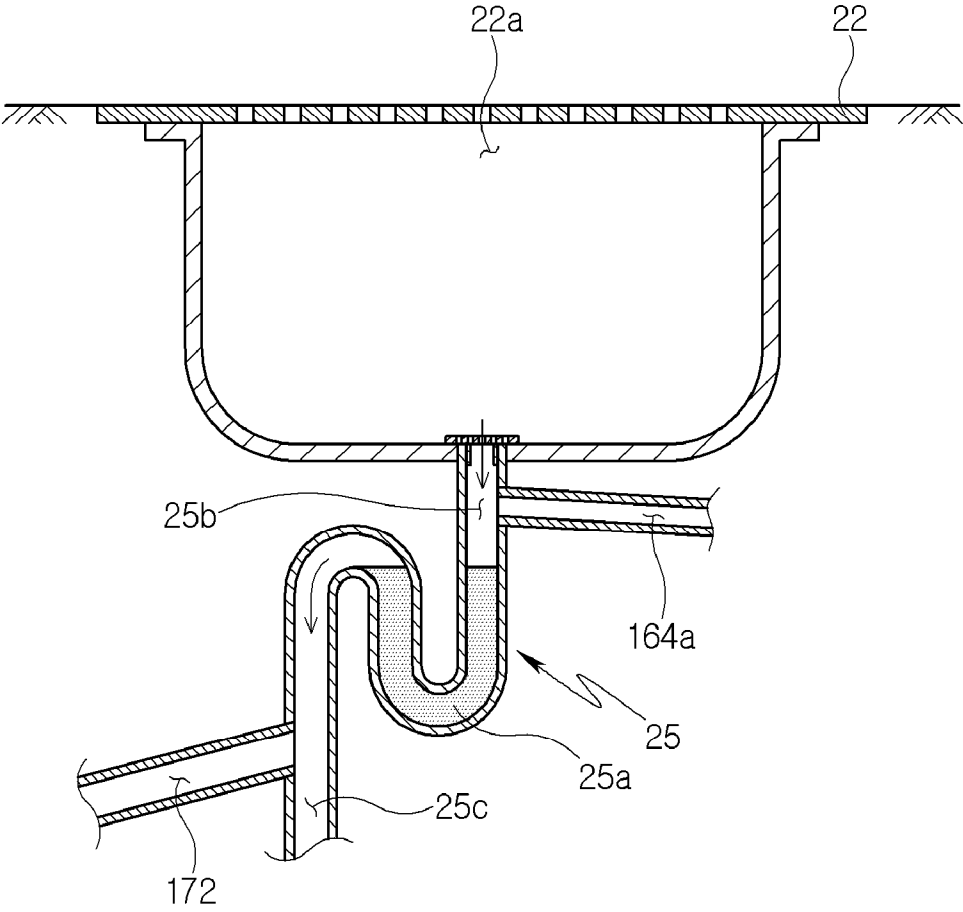
a housing disposed at a lower side of a kitchen cabinet;
a seating unit disposed in the housing and configured to accommodate a robot cleaner;
a mop drying unit configured to dry a mop of the robot cleaner; and
a power supply module including a power supply terminal configured to contact a charging terminal of the robot cleaner and configured to supply power to the robot cleaner,
wherein the mop drying unit includes:

an external air supply module in which an external air supply flow path through which external air is introduced is formed,
and at least a portion of the power supply module is disposed above the external air supply module.

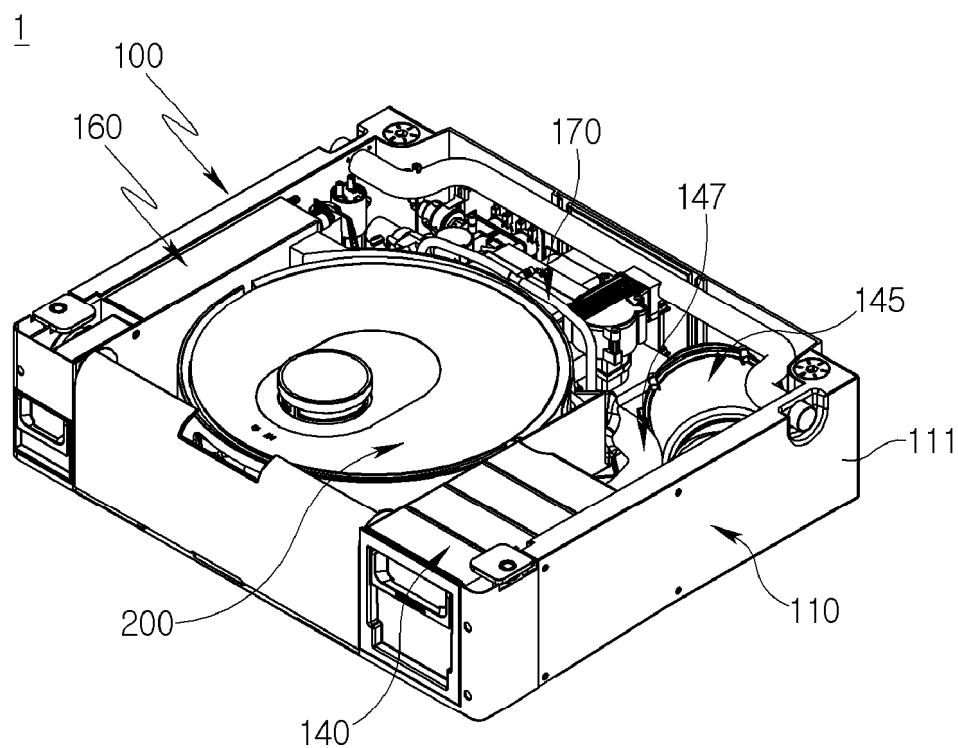
[FIG. 1]



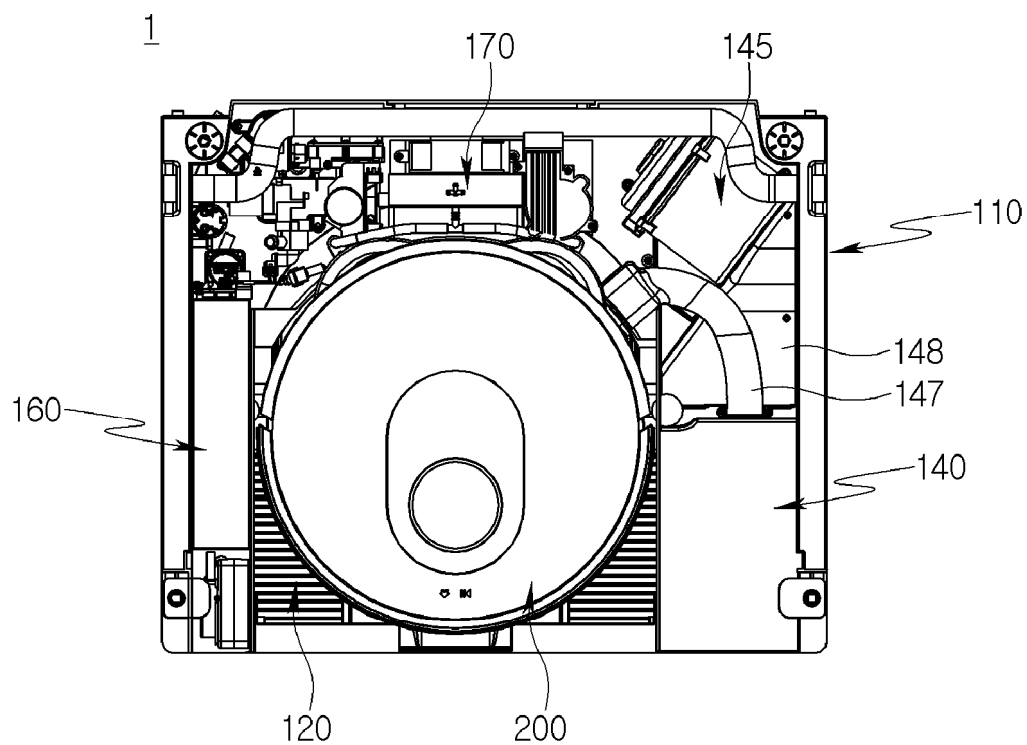
[FIG. 2]



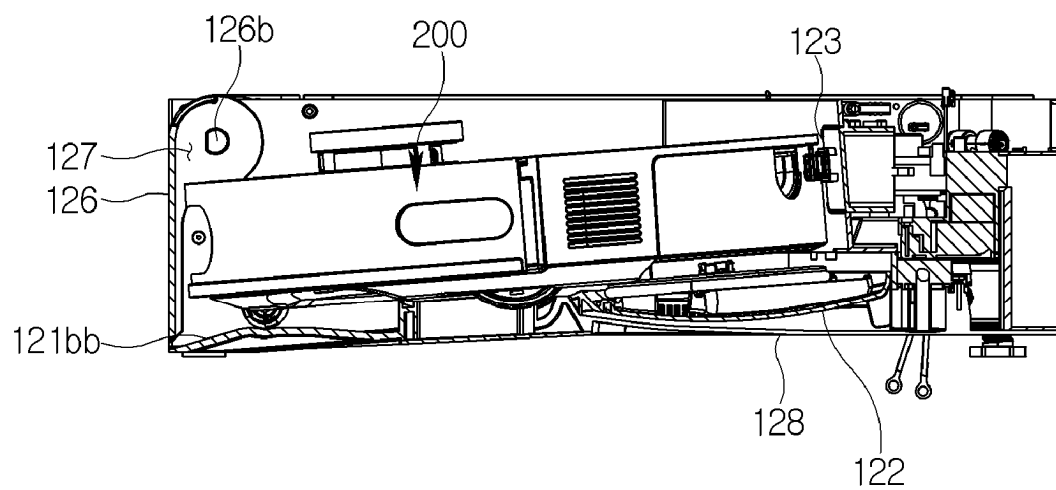
[FIG. 3]



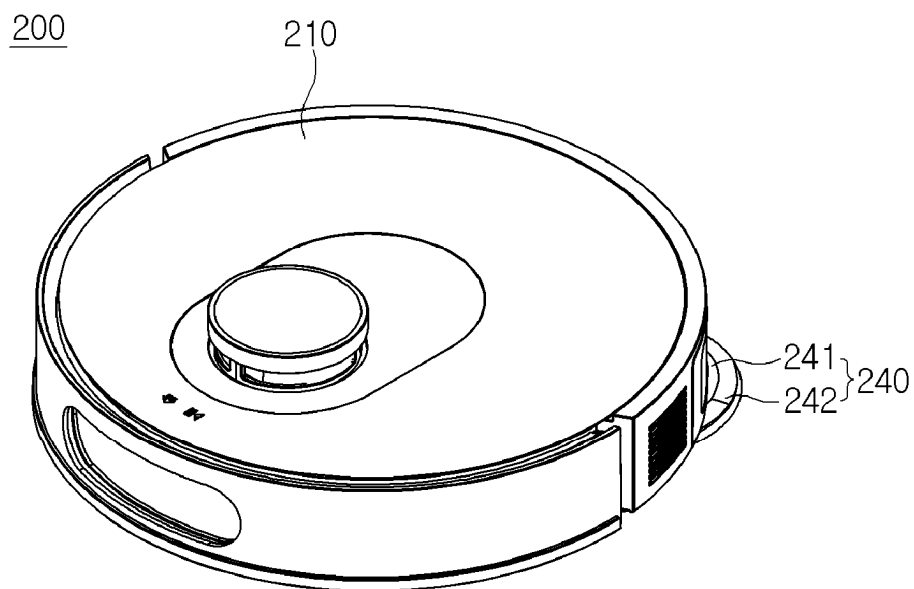
[FIG. 4]



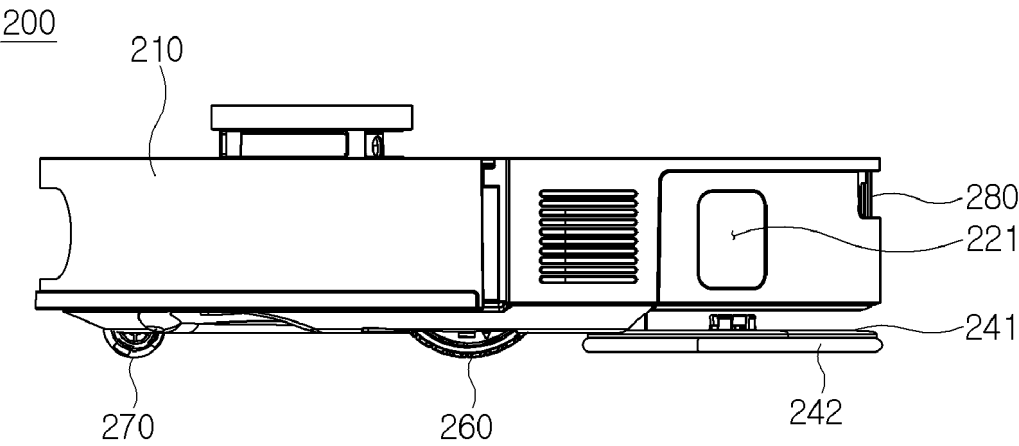
[FIG. 5]



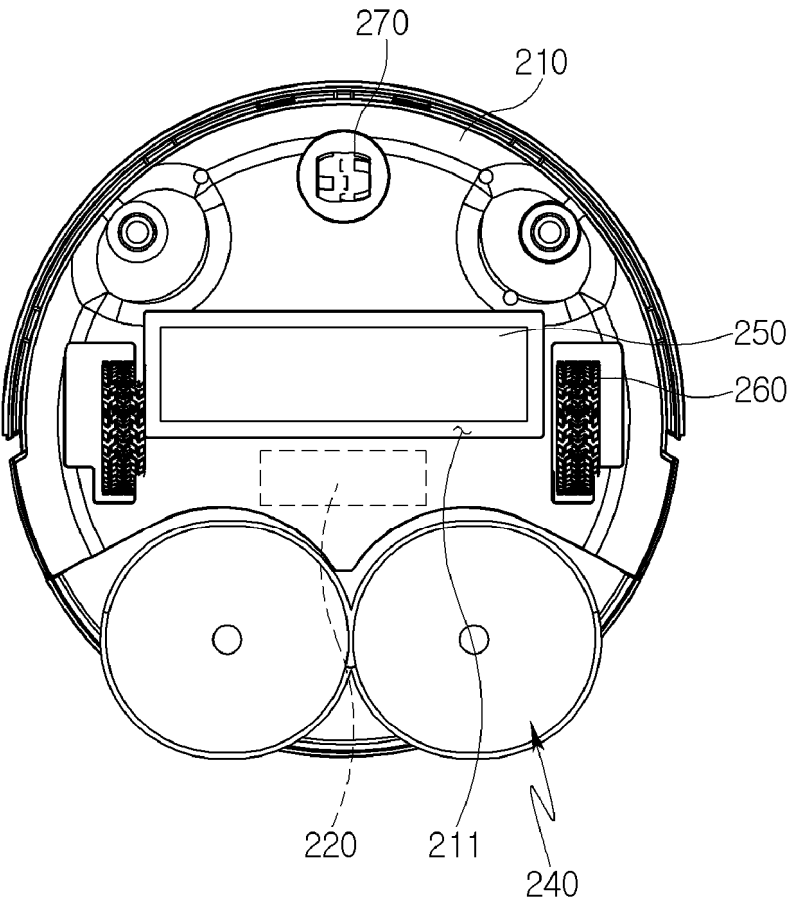
[FIG. 6]



[FIG. 7]

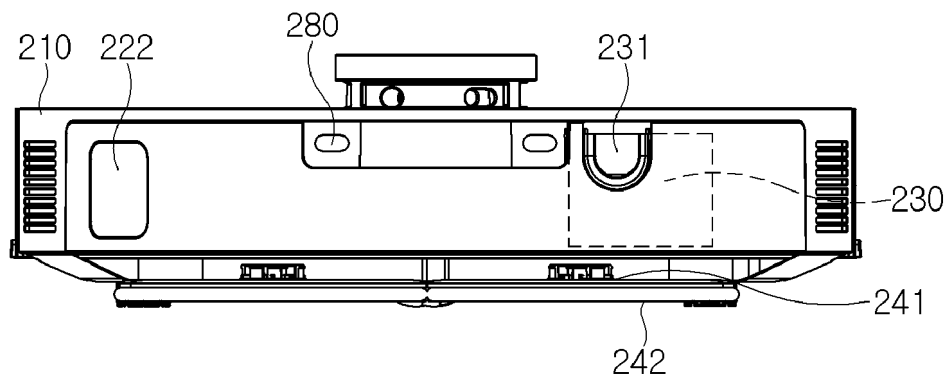


[FIG. 8]



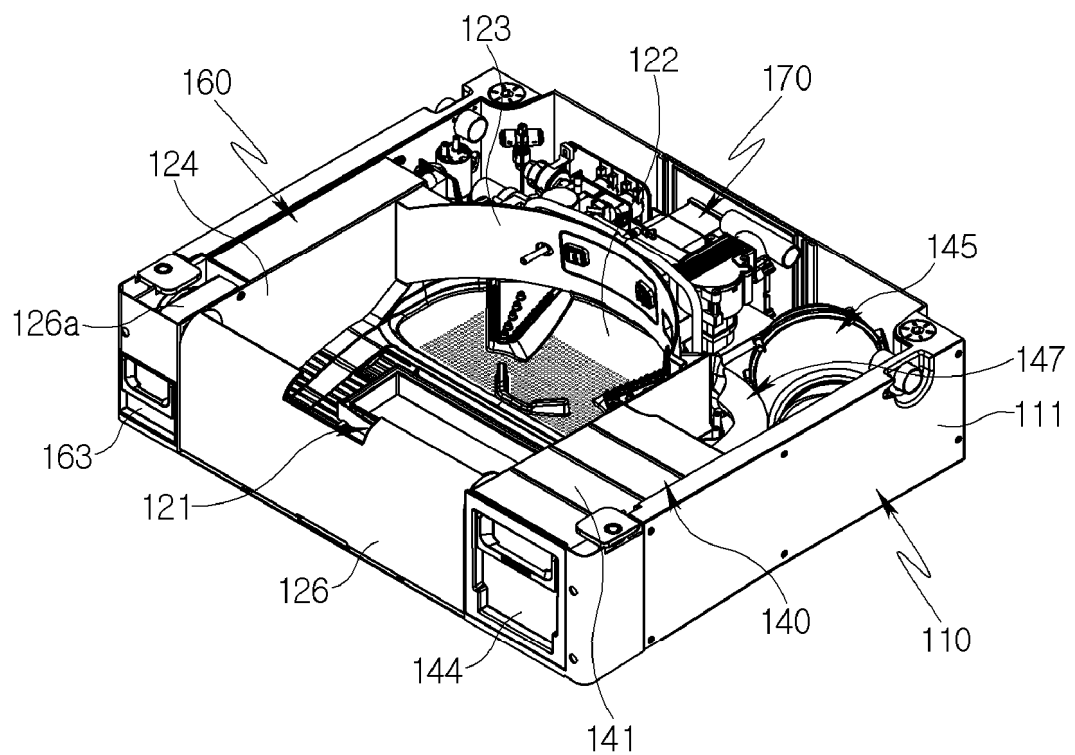
[FIG. 9]

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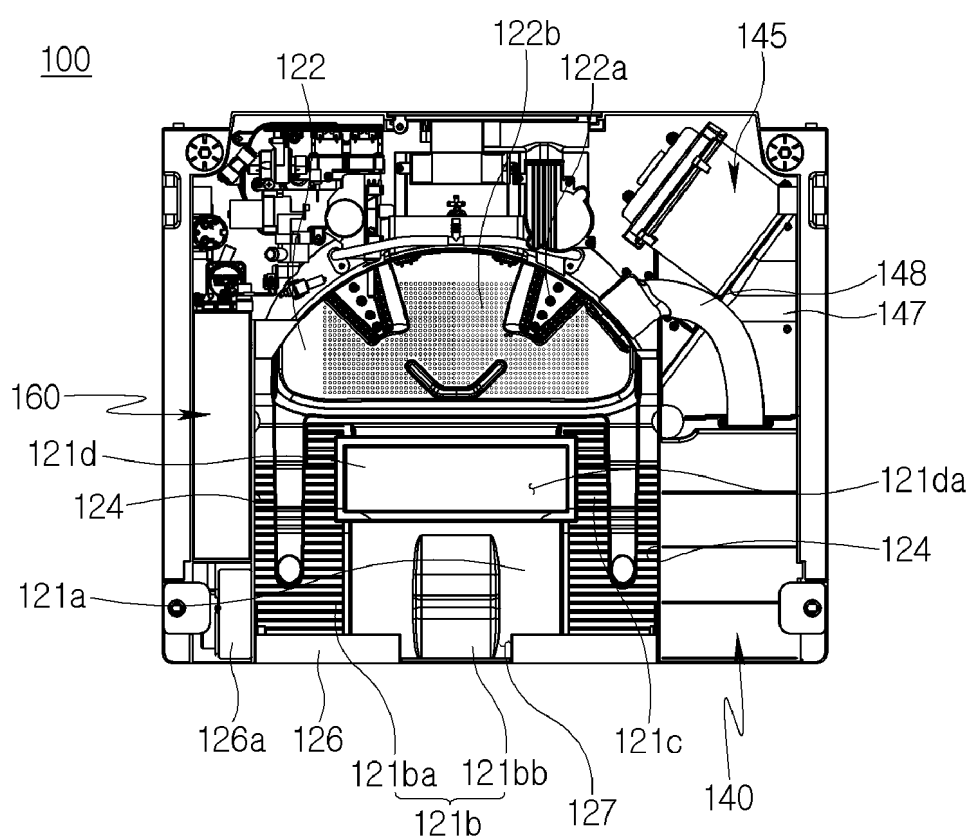


[FIG. 10]

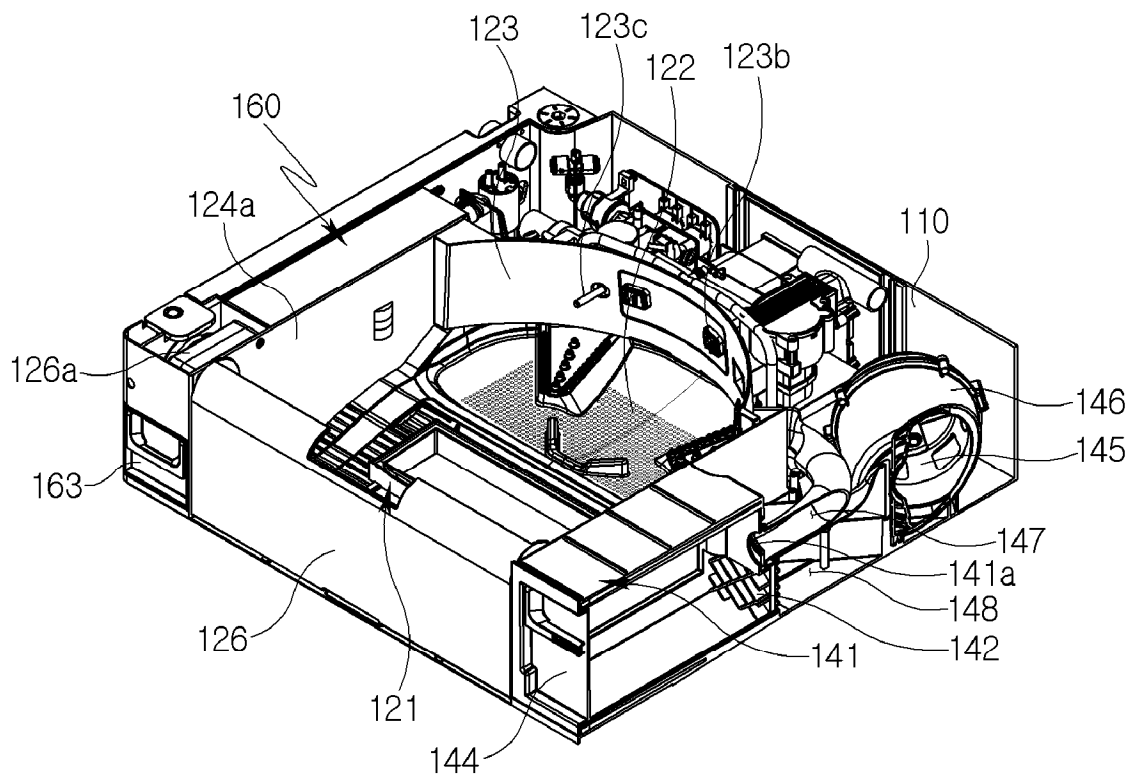
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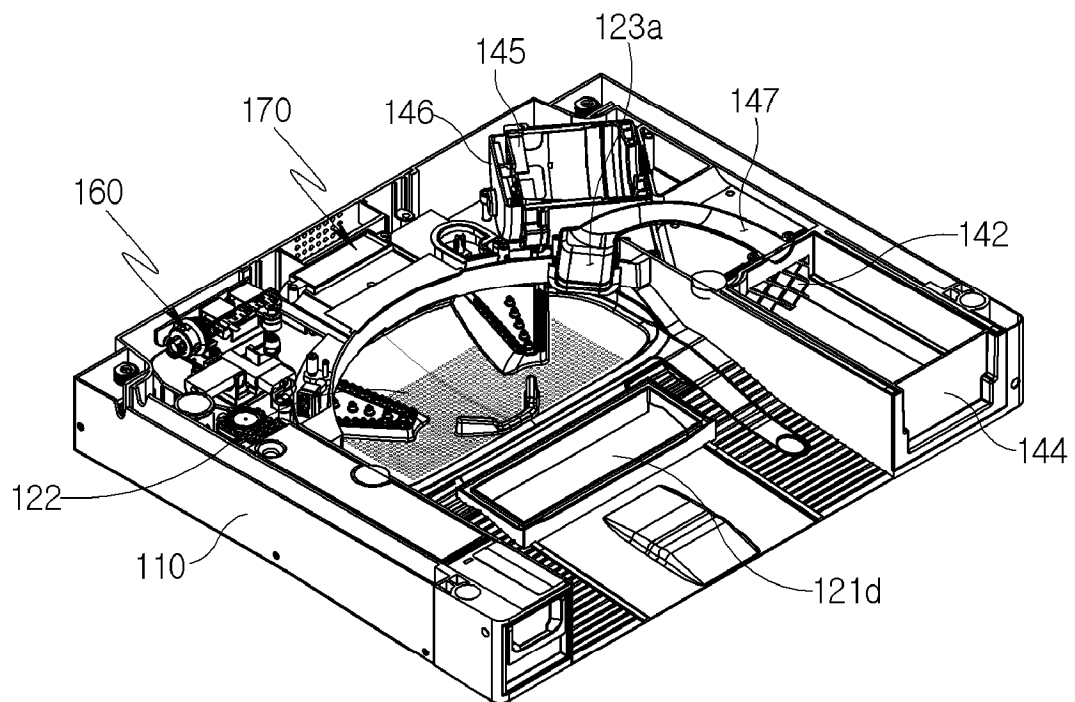
[FIG. 11]



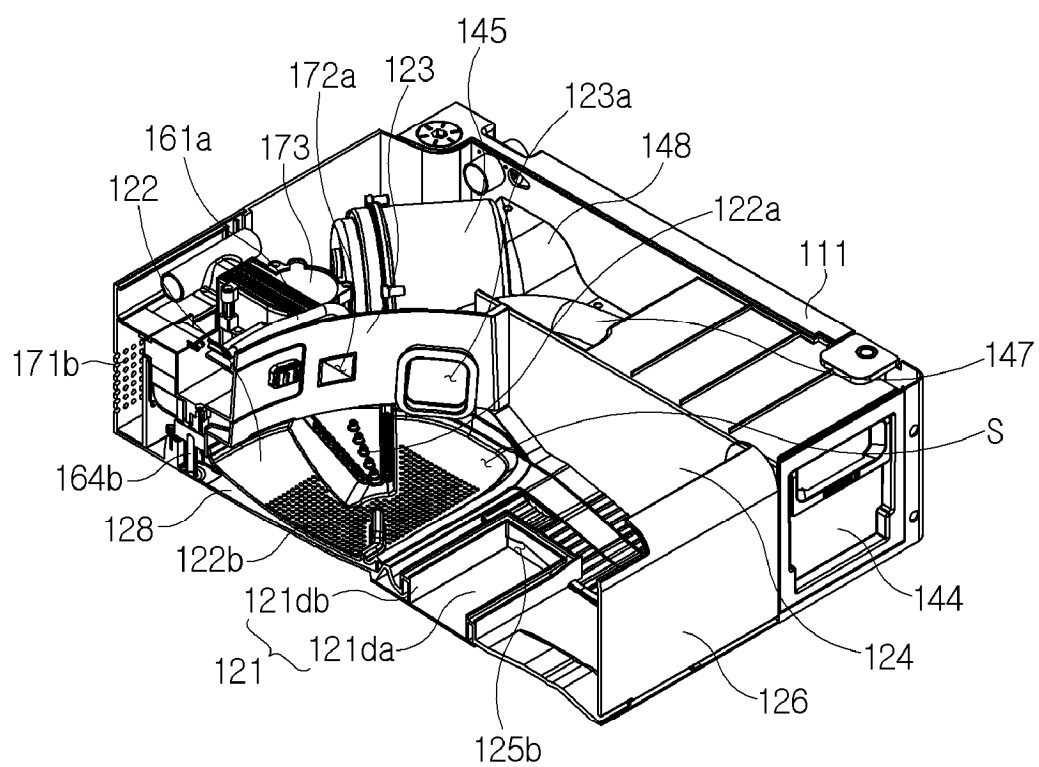
[FIG. 12]



[FIG. 13]

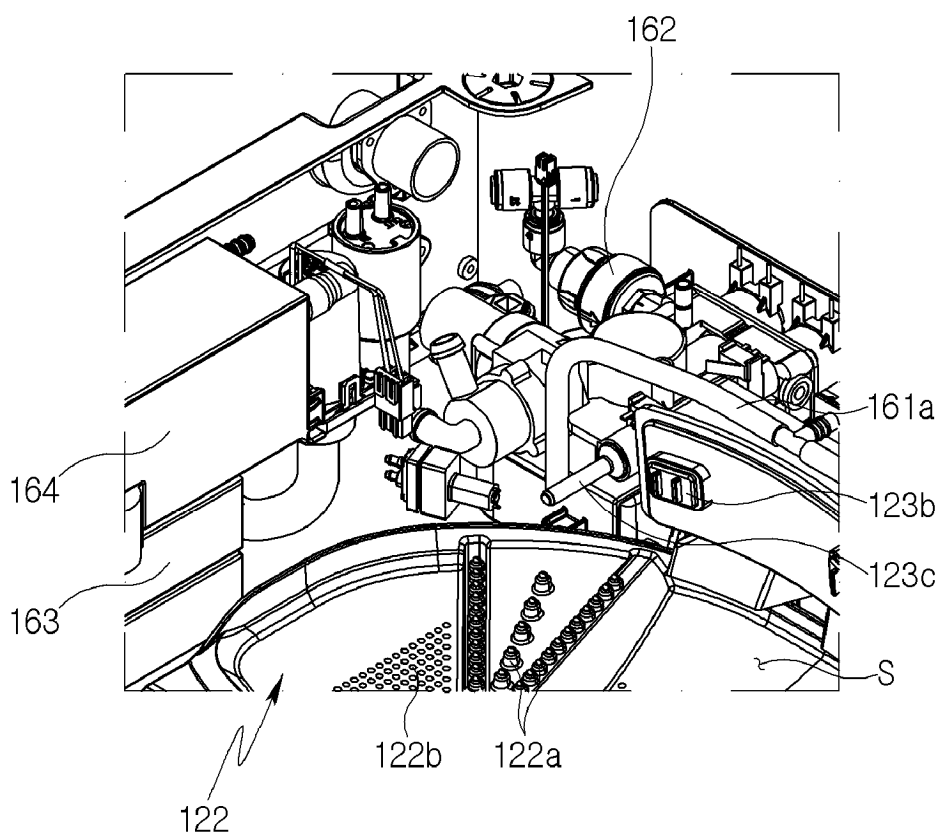


[FIG. 14]

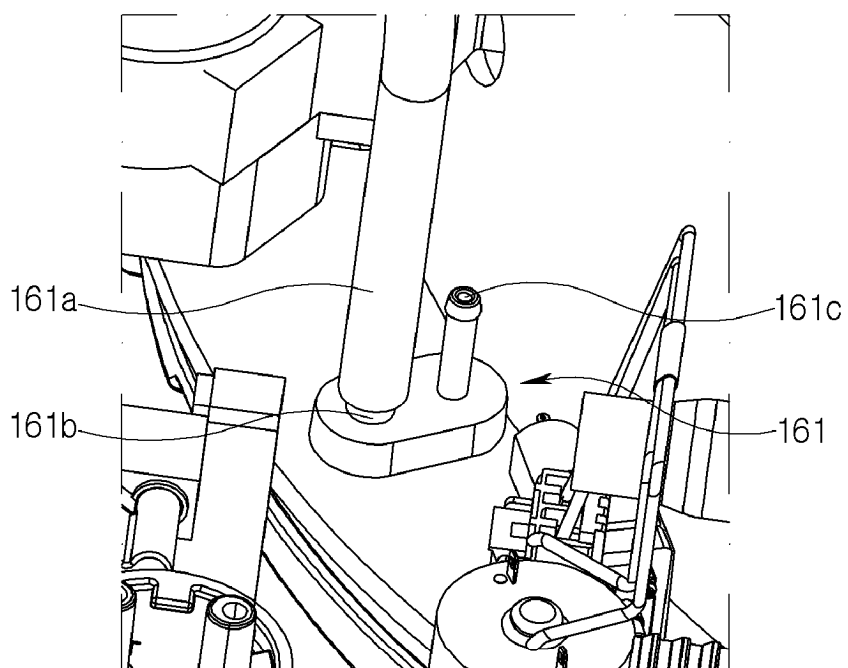


[FIG. 15]

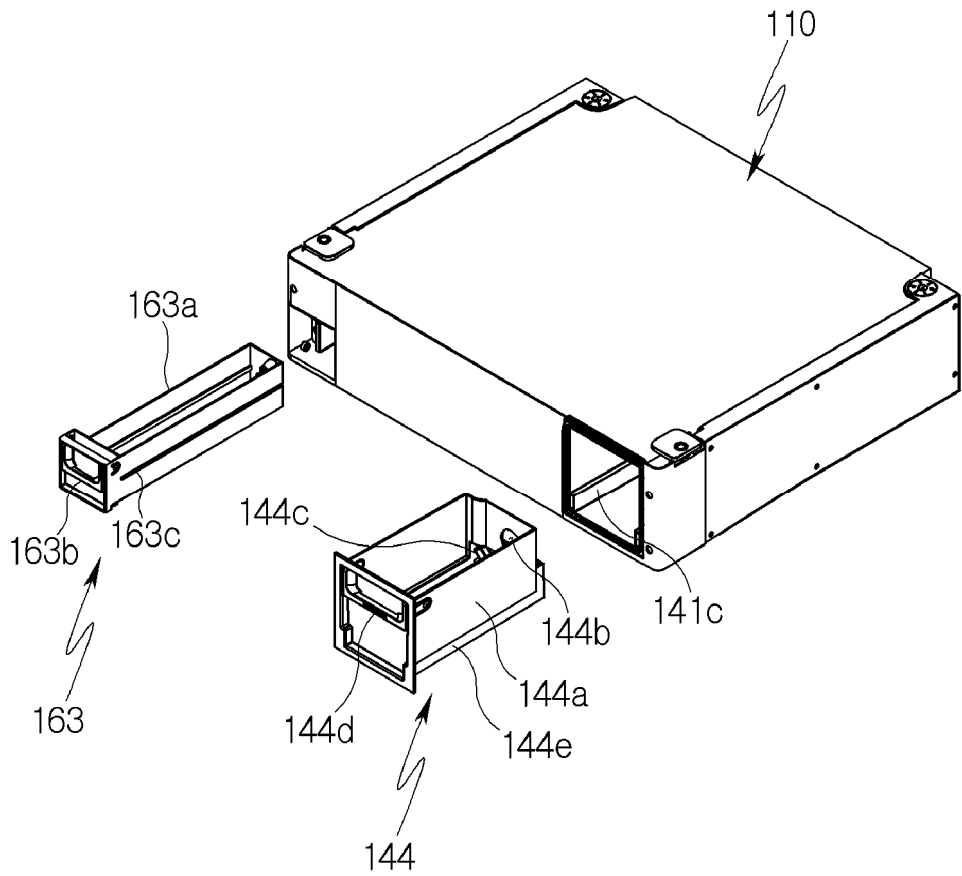
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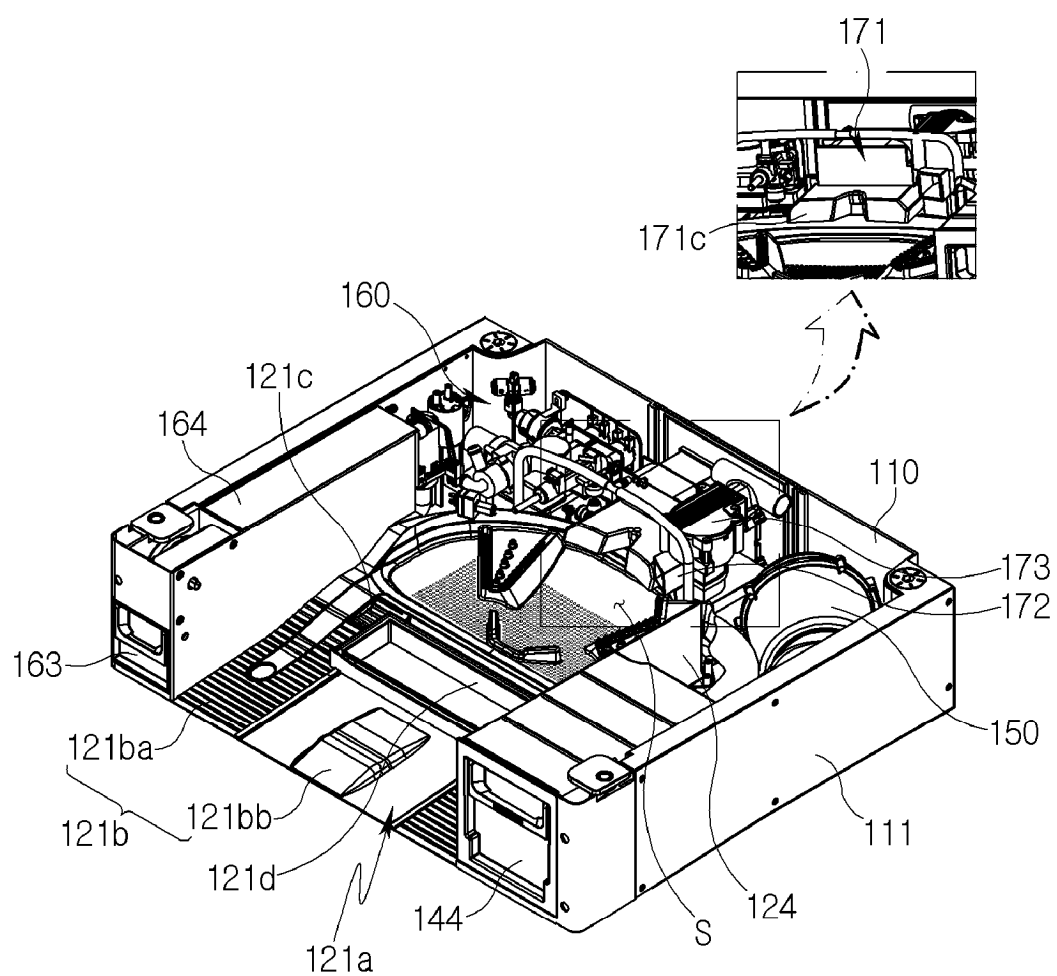
[FIG. 16]



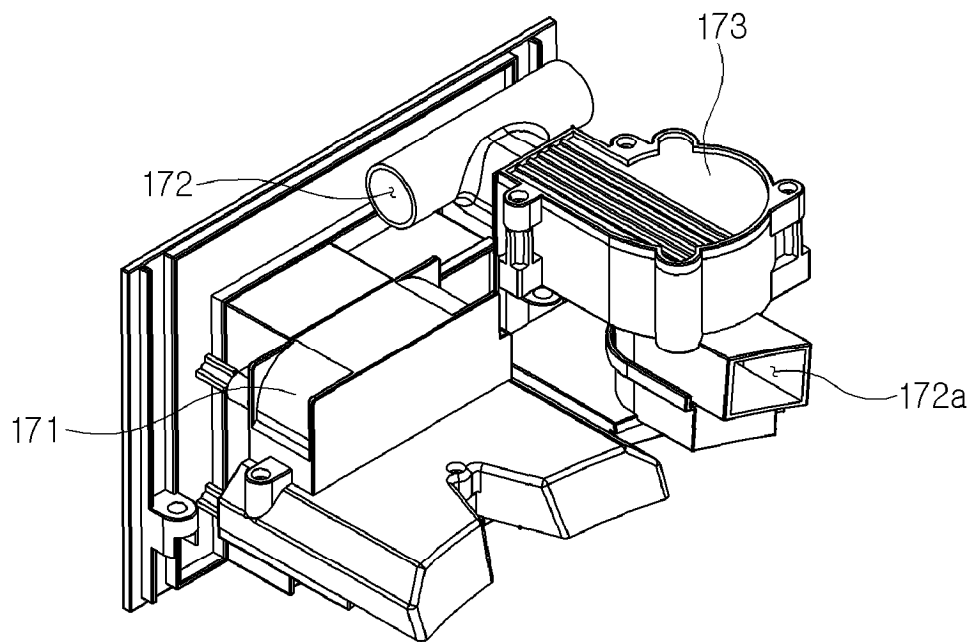
[FIG. 17]



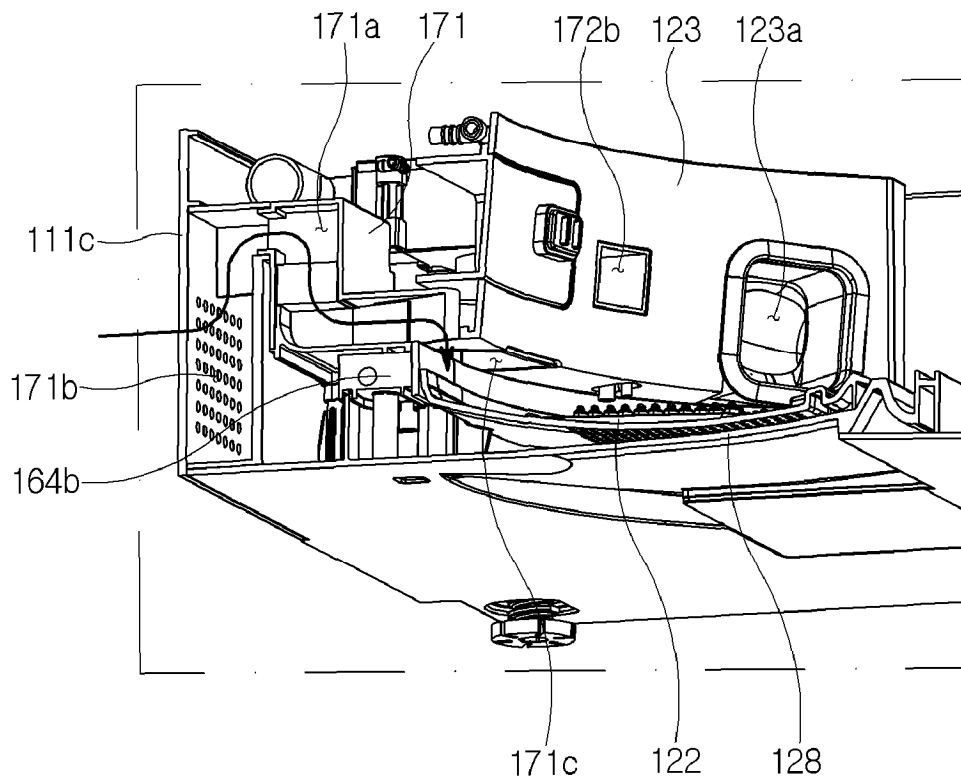
[FIG. 18]



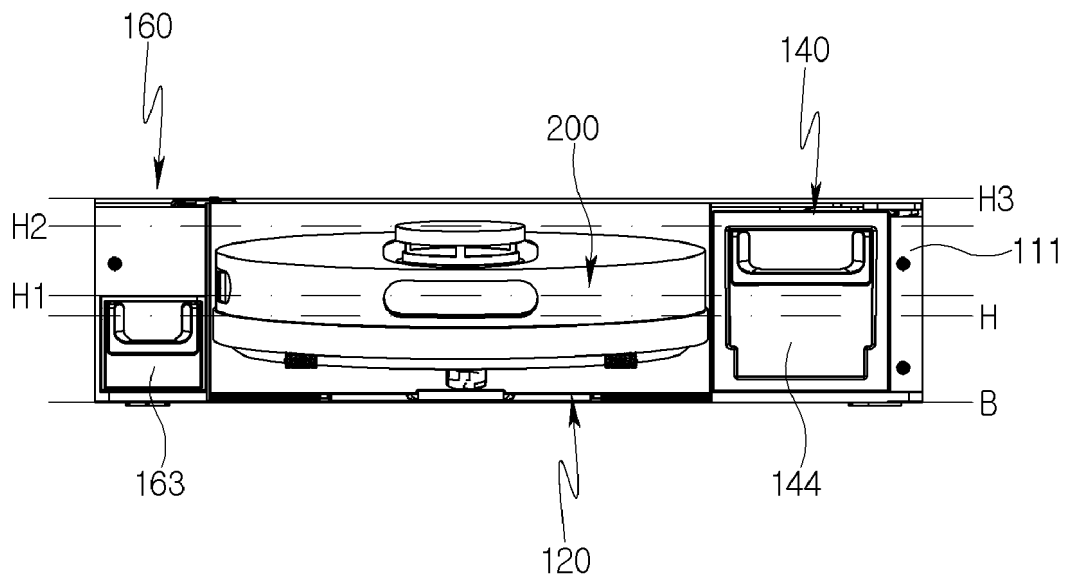
[FIG. 19]



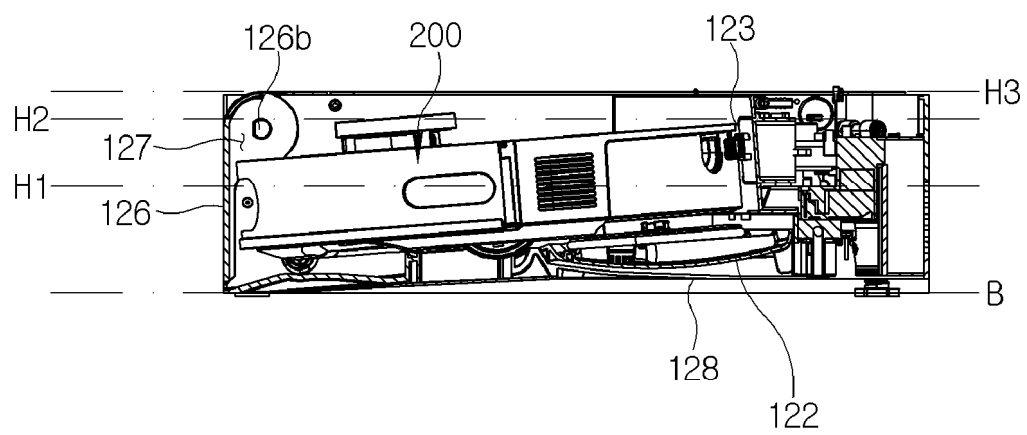
[FIG. 20]



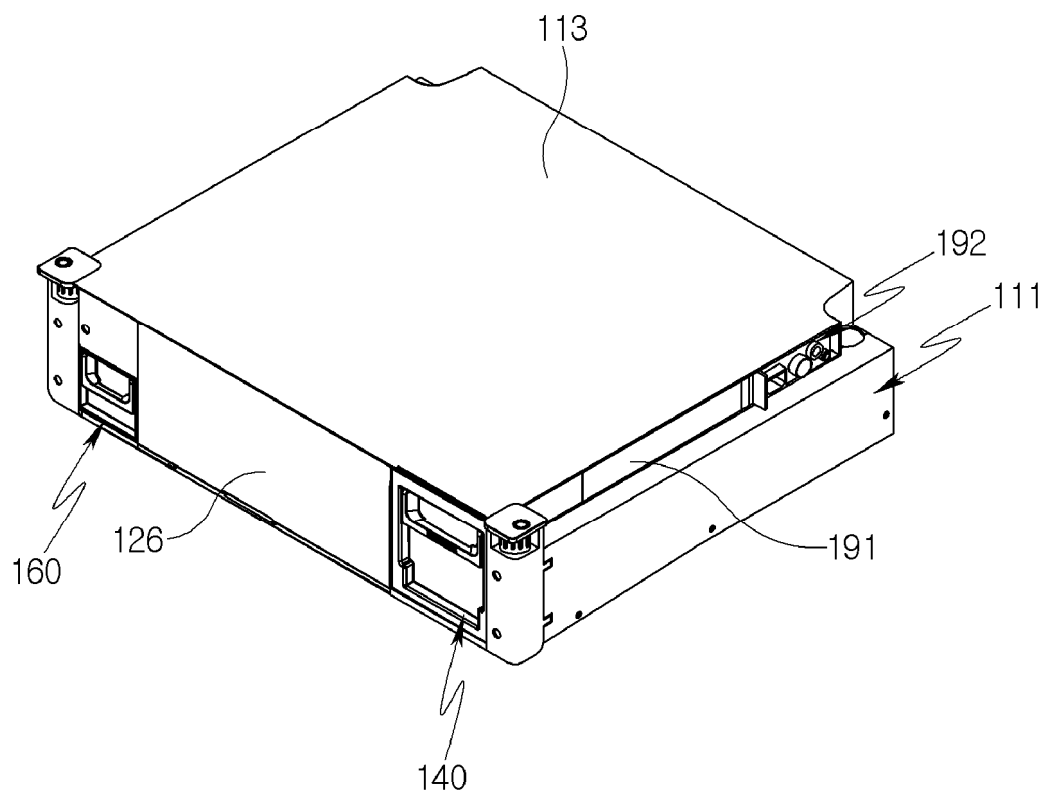
[FIG. 21]



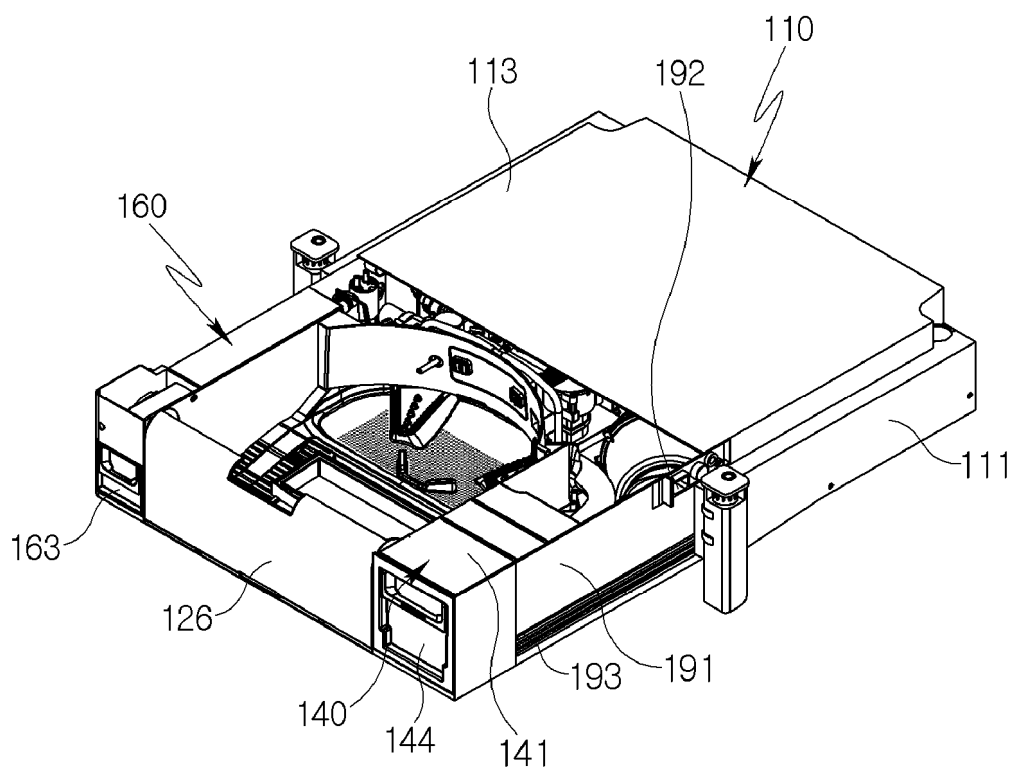
[FIG. 22]



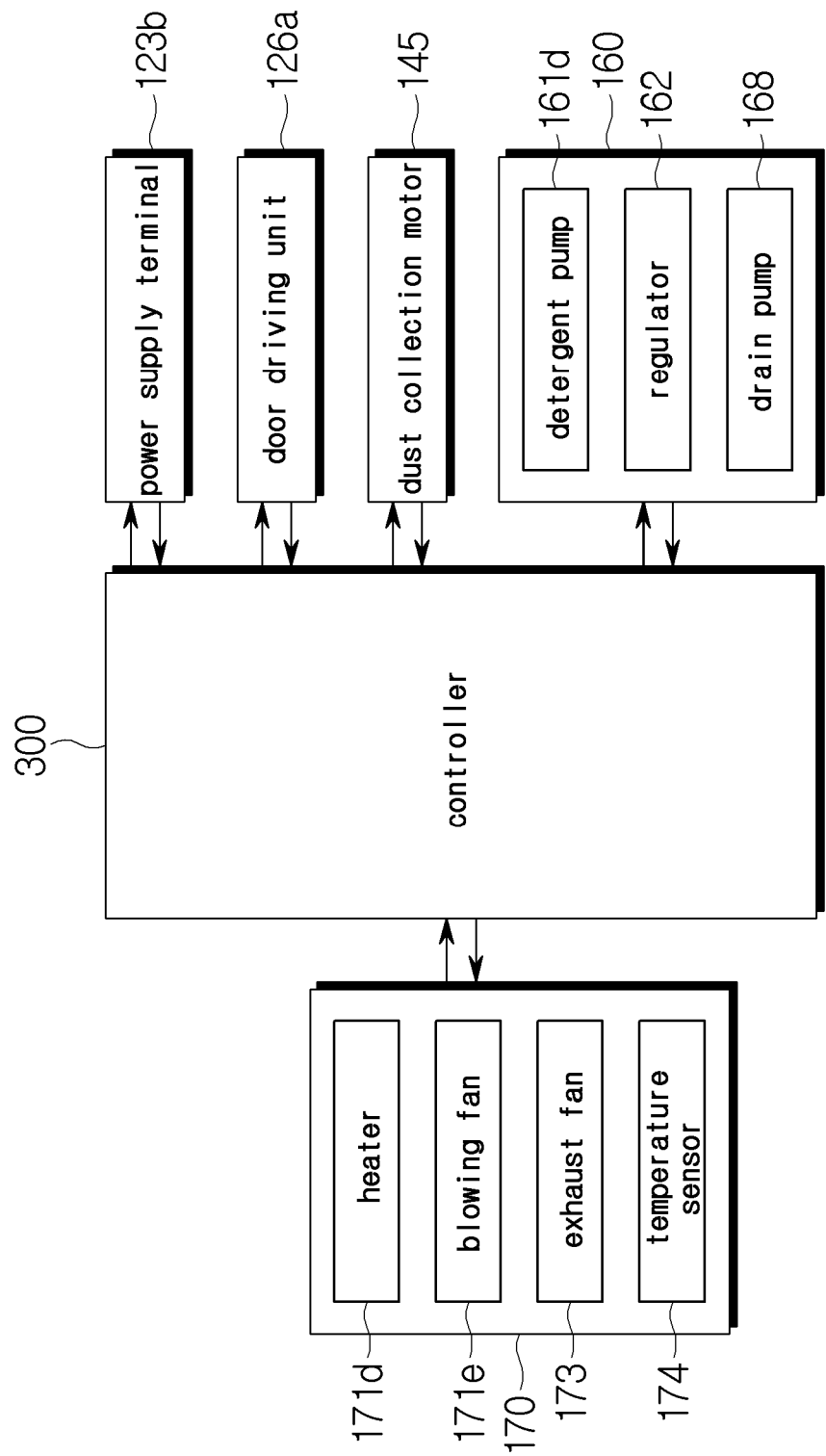
[FIG. 23]



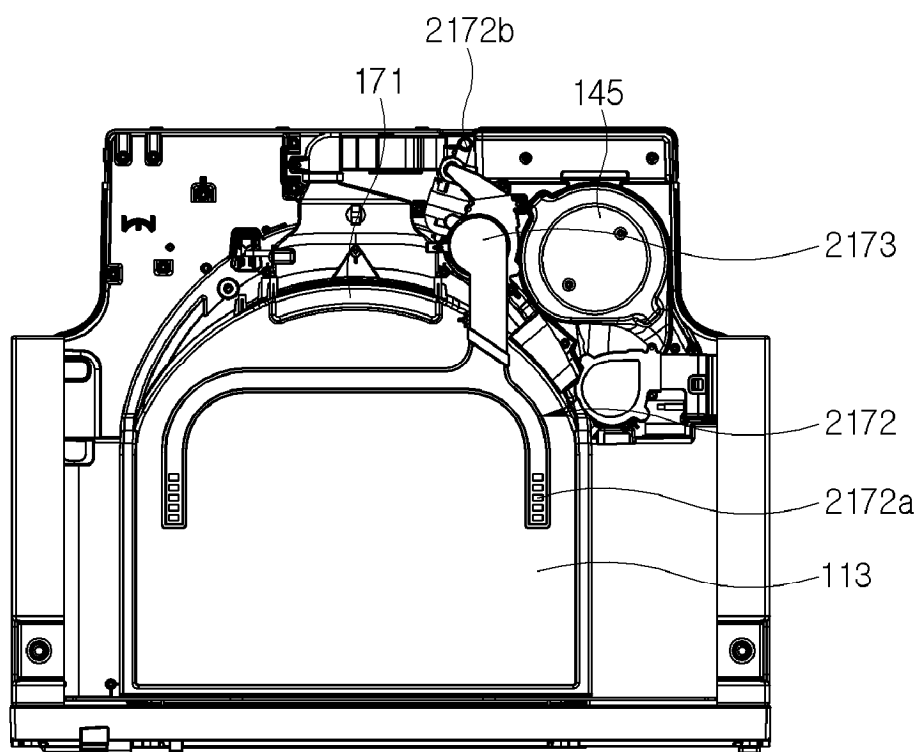
[FIG. 24]



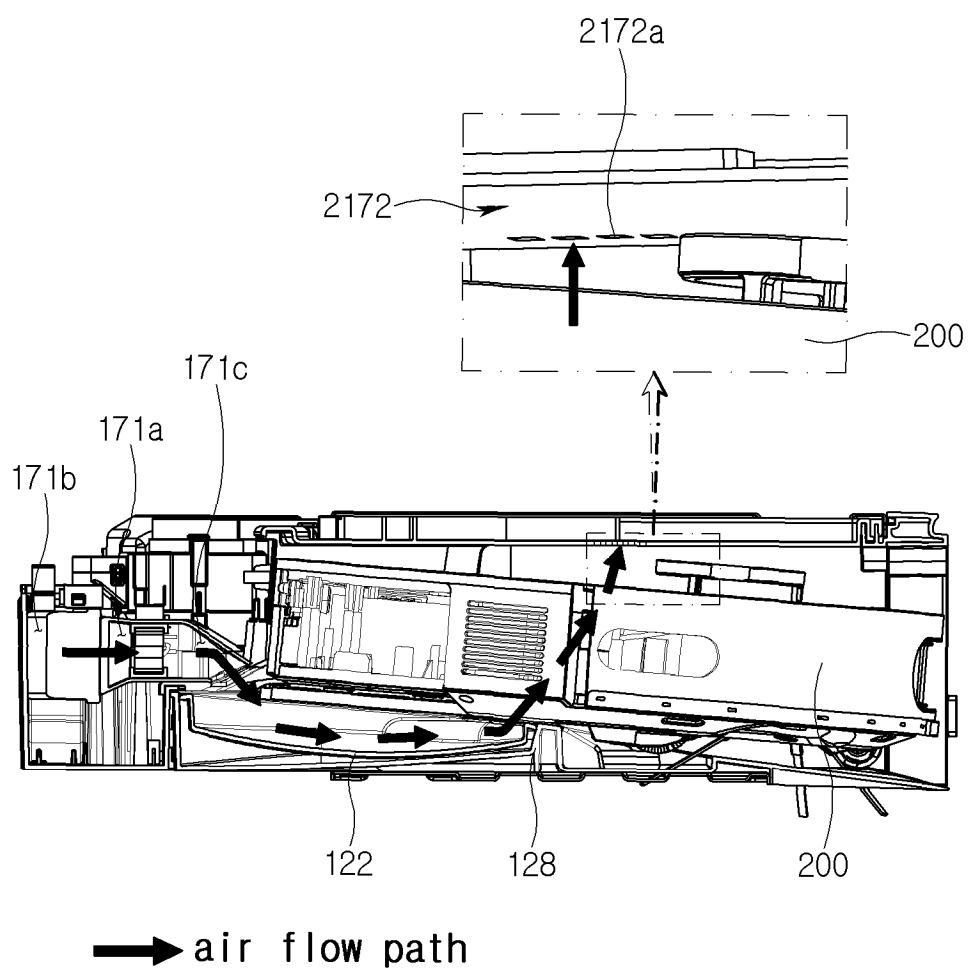
[FIG. 25]



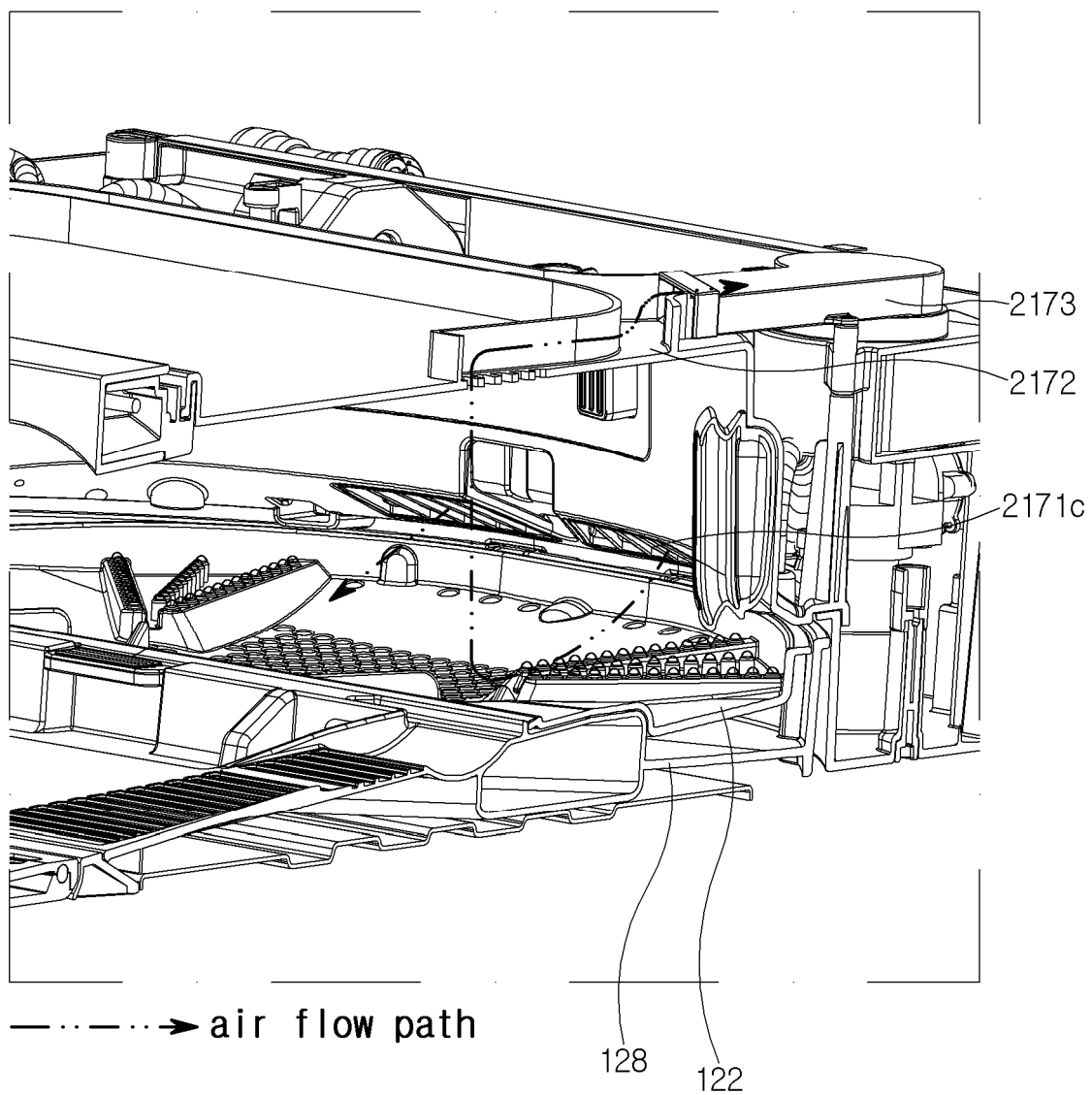
[FIG. 26]



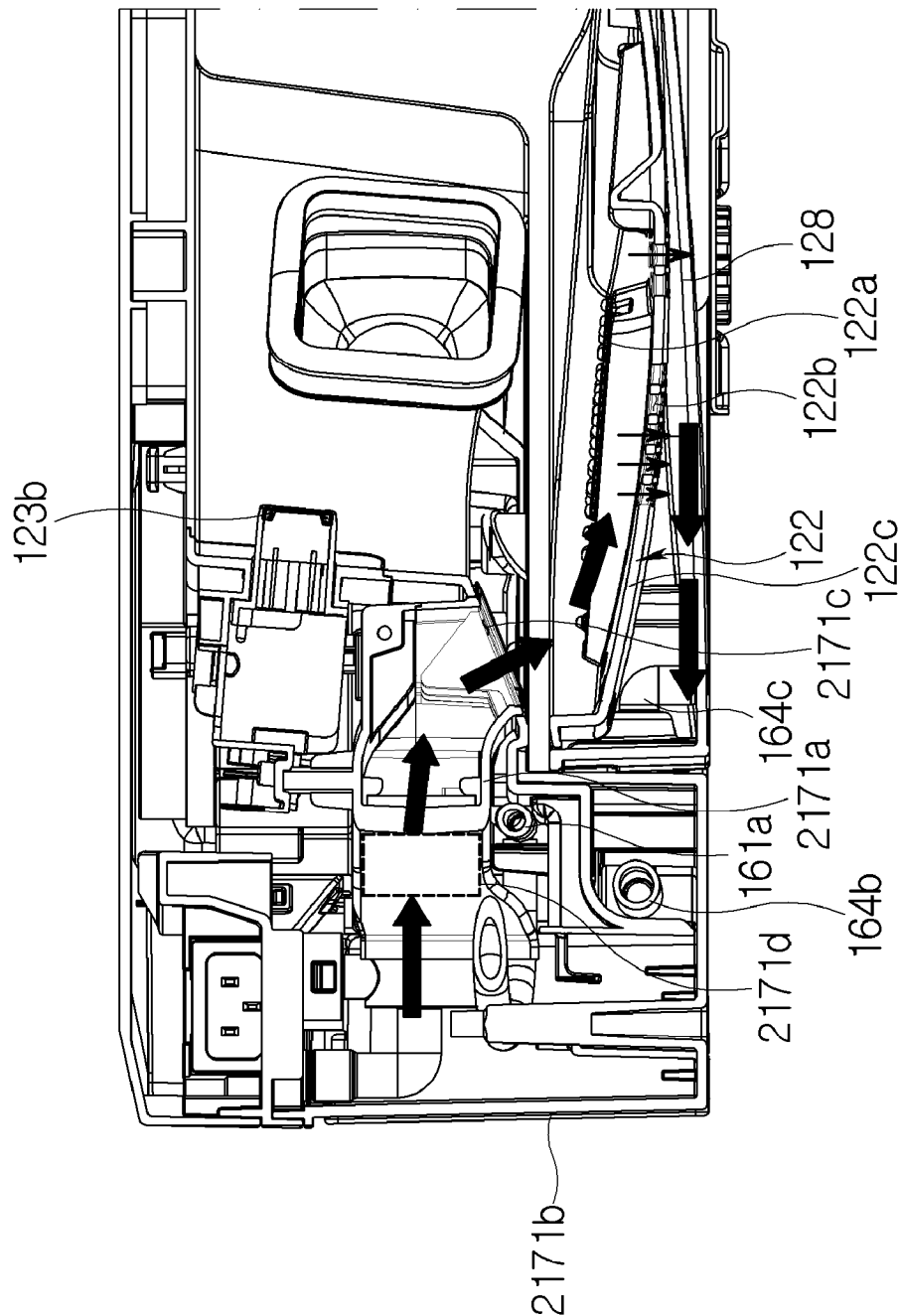
[FIG. 27]



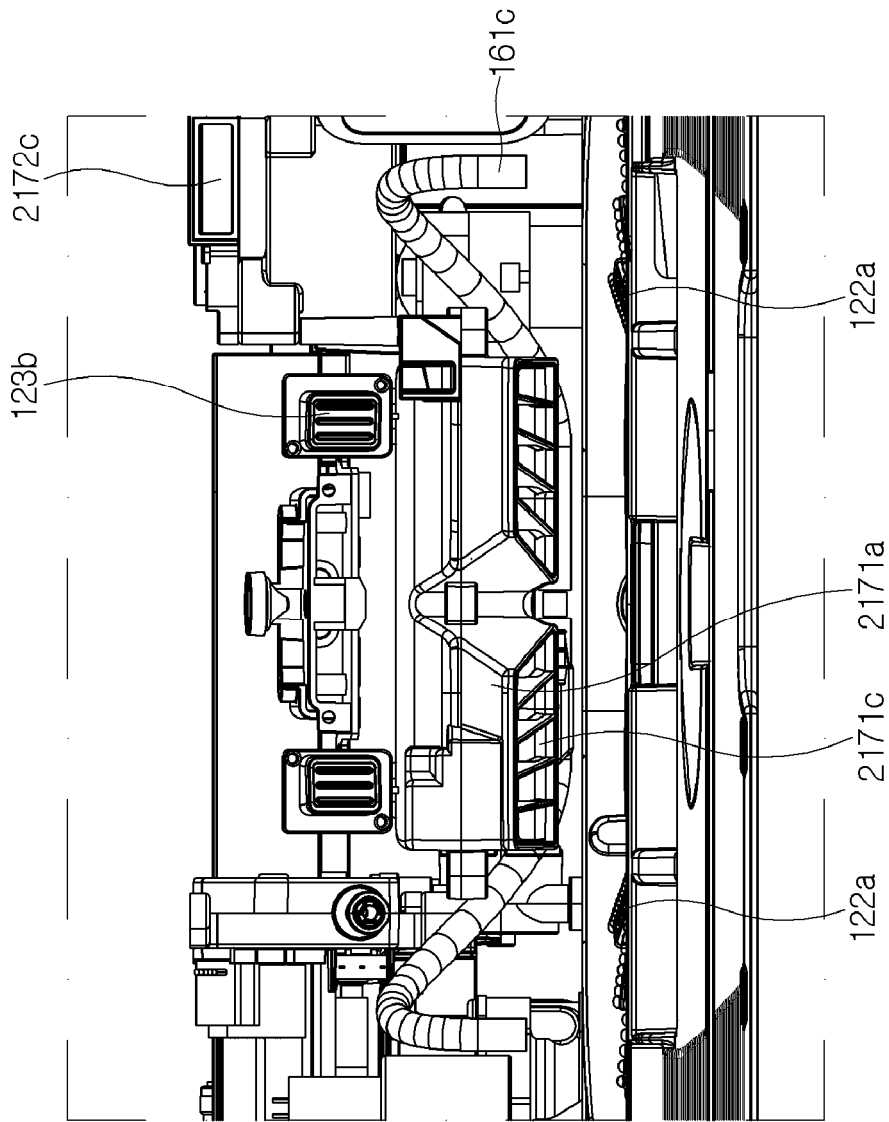
[FIG. 28]



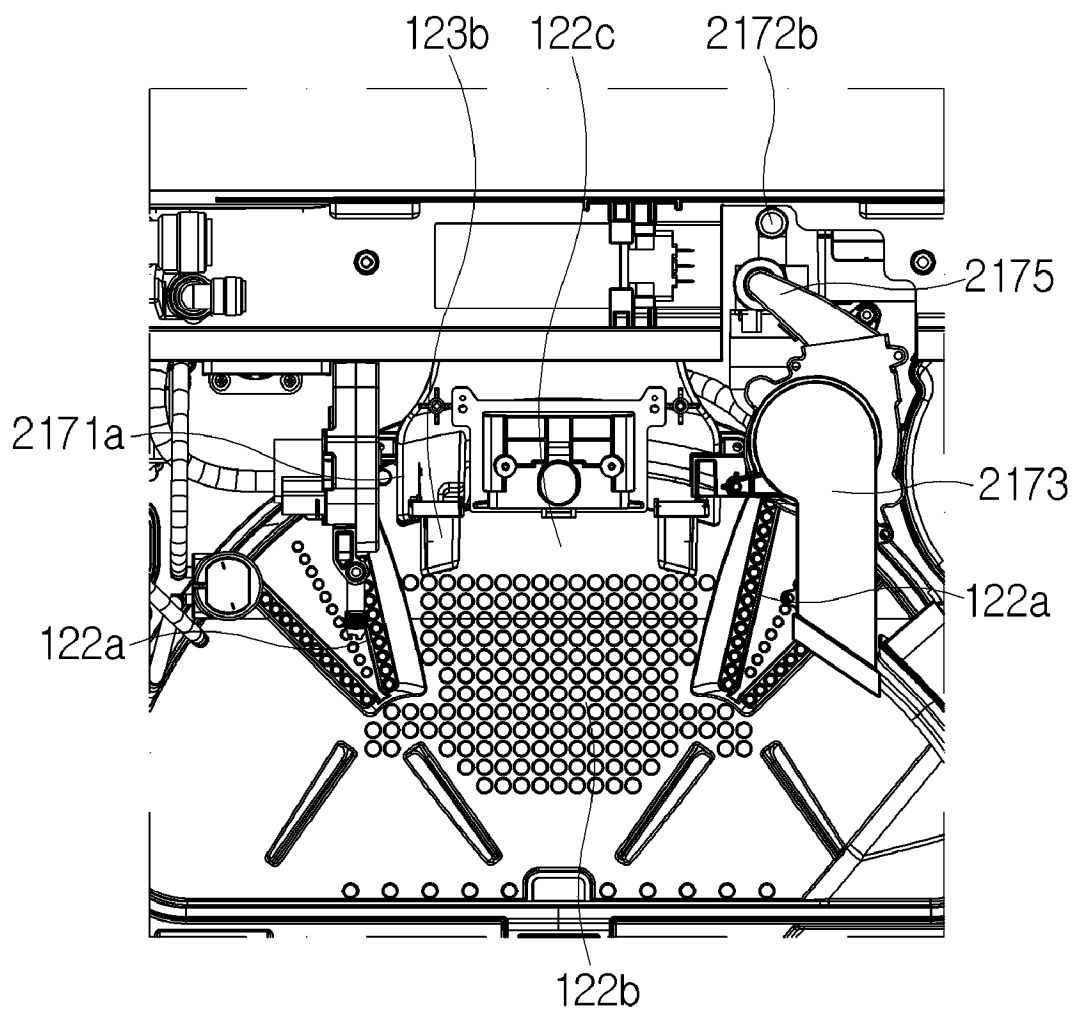
[FIG. 29]



[FIG. 30]



[FIG. 31]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2024/013561

A. CLASSIFICATION OF SUBJECT MATTER

A47L 11/40(2006.01)i; F26B 21/00(2006.01)i; A47B 77/04(2006.01)i; A47L 7/00(2006.01)i; A47L 5/38(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 11/40(2006.01); A47B 67/00(2006.01); A47B 77/08(2006.01); A47L 11/24(2006.01); A47L 11/30(2006.01);
A47L 9/00(2006.01); A47L 9/28(2006.01)

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

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

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

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

eKOMPASS (KIPO internal) & keywords: 로봇 청소기(robot cleaner), 스테이션(station), 걸레(mop), 세척(washing), 건조(drying), 히터(heater), 유동가이드(flow guide)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 218922468 U (HUBEI MIDEA WASHING MACHINE CO., LTD.) 28 April 2023 (2023-04-28) See paragraphs [0034] and [0056], claims 1-3 and figures 1-5.	1-19
Y	CN 114668345 A (SHENZHEN TSUCHUAN ROBOT LIMITED COMPANY) 28 June 2022 (2022-06-28) See paragraphs [0042]-[0061] and figures 5-7.	1-19
Y	CN 218738809 U (SHENZHEN YINXING INTELLIGENT GROUP CO., LTD.) 28 March 2023 (2023-03-28) See claims 1 and 9 and figures 1-7 and 12.	3,5-8,12,13,18
A	JP 2001-137056 A (MITSUBISHI ELECTRIC CORP. et al.) 22 May 2001 (2001-05-22) See claim 1 and figures 1 and 2.	1-19
A	JP 2007-301344 A (TOYOTA MOTOR CORP.) 22 November 2007 (2007-11-22) See claims 9-22 and figures 10-14 and 16.	1-19

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

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Date of the actual completion of the international search

19 December 2024

Date of mailing of the international search report

19 December 2024

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Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2024/013561

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN	218922468	U	28 April 2023	None	
CN	114668345	A	28 June 2022	None	
CN	218738809	U	28 March 2023	None	
JP	2001-137056	A	22 May 2001	None	
JP	2007-301344	A	22 November 2007	JP	4916266 B2 11 April 2012

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 219206761 U [0008]
- CN 218922468 U [0013]