



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

(43) Date of publication:
26.06.2024 Bulletin 2024/26

(51) International Patent Classification (IPC):
A47L 9/14 (2006.01)

(21) Application number: **22857538.7**

(86) International application number:
PCT/CN2022/108266

(22) Date of filing: **27.07.2022**

(87) International publication number:
WO 2023/020225 (23.02.2023 Gazette 2023/08)

(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 MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(72) Inventors:
• **ZHANG, Lele**
Hangzhou, Zhejiang 310051 (CN)
• **JIN, Jingyang**
Hangzhou, Zhejiang 310051 (CN)
• **MENG, Xiangwei**
Hangzhou, Zhejiang 310051 (CN)

(30) Priority: **18.08.2021 CN 202110947243**

(74) Representative: **Epping - Hermann - Fischer**
Patentanwaltsgesellschaft mbH
Schloßschmidstraße 5
80639 München (DE)

(71) Applicant: **Hangzhou Ezviz Software Co., Ltd.**
Zhejiang 310051 (CN)

(54) **DUST COLLECTION ASSEMBLY OF ROBOT VACUUM CLEANER, AND ROBOT VACUUM CLEANER**

(57) The present application discloses a dust collection assembly of a sweeping robot and a sweeping robot. The dust collection assembly includes: a dust collection box, which has a dust collection inner cavity, and also has an inner cavity opening and a ventilation box wall which are both connected to the dust collection inner cavity; a movable cover, which has a dust collection air opening and also has a bagging mechanism; the bagging mechanism is configured for detachably installing a replaceable dust collection bag, and enabling a dust collection bag opening of the replaceable dust collection bag to be docked with the dust collection air opening;

when the movable cover closes the dust collection inner cavity at the inner cavity opening, the replaceable dust collection bag is located in an interior of the dust collection inner cavity, such that the dust-carrying airflow flowing from the dust collection air opening to the interior of the dust collection inner cavity is poured into the dust collection bag from the dust collection bag opening; when the movable cover leaves the inner cavity opening to open the dust collection inner cavity, the replaceable dust collection bag follows the movable cover to move from the inner cavity opening to an outside of the dust collection inner cavity.

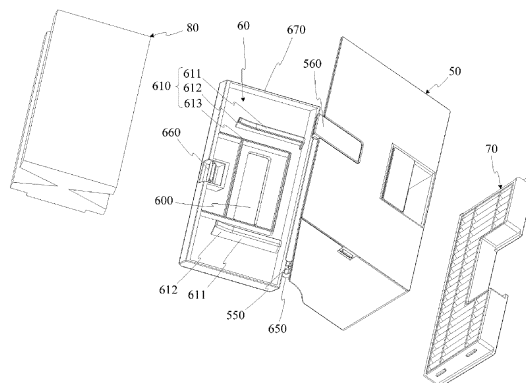


Fig. 1

Description

[0001] The present application claims the priority to a Chinese Patent Application No. 202110947243.6, filed with the China National Intellectual Property Administration on August 18, 2021 and entitled "Dust Collection Assembly of Sweeping Robot and Sweeping Robot", which is incorporated herein by reference in its entirety.

Technical Field

[0002] The present application relates to robot technology, and in particular to a dust collection assembly of a sweeping robot and a sweeping robot.

Background

[0003] The sweeping robot can be used to clean the ground, and can be equipped with a dust collection box for storing dust temporarily. Moreover, when the dust collection box is full of the dust or the cleaning task of the sweeping robot is completed, it is necessary to clean the interior of the dust collection box.

[0004] However, since the interior of the dust collection box is contaminated by the dust, when the interior of the dust collection box is to be cleaned, it is necessary to carry out a relatively cumbersome cleaning operation to remove the accumulated dust attached to the interior of the dust collection box, resulting in a low cleaning efficiency and a poor user experience.

[0005] Therefore, how to simplify the process of cleaning the interior of the dust collection box is a technical problem that needs to be solved in related technologies.

Summary

[0006] The embodiments of the present application provide a dust collection assembly of a sweeping robot and a sweeping robot, which facilitates simplifying the cleaning of the interior of the dust collection box.

[0007] Embodiments of a first aspect of the present disclosure provide a dust collection assembly of a sweeping robot. The dust collection assembly includes: a dust collection box and a movable cover. The dust collection box has a dust collection inner cavity, and also has an inner cavity opening and a ventilation box wall which are both connected to the dust collection inner cavity. The movable cover has a dust collection air opening and also has a bagging mechanism.

[0008] The bagging mechanism is configured for detachably installing a replaceable dust collection bag, and enabling a dust collection bag opening of the replaceable dust collection bag to be docked with the dust collection air opening. When the movable cover closes the dust collection inner cavity at the inner cavity opening, the replaceable dust collection bag is located in an interior of the dust collection inner cavity, such that the dust-carrying airflow flowing from the dust collection air open-

ing to the interior of the dust collection inner cavity is poured into the dust collection bag from the dust collection bag opening, wherein, dust in the dust-carrying airflow is collected inside the replaceable dust collection bag, and a clean airflow that flows through and seep out from the replaceable dust collection bag flows out of the dust collection box through the ventilation box wall. When the movable cover leaves the inner cavity opening to open the dust collection inner cavity, the replaceable dust collection bag follows the movable cover to move from the inner cavity opening to an outside of the dust collection inner cavity.

[0009] According to the dust collection assembly of the sweeping robot in the embodiments of the present disclosure, the dust collection assembly may include the dust collection box with the dust collection inner cavity and the movable cover for closing the dust collection inner cavity, wherein the movable cover may have the bagging mechanism that can detachably install the replaceable dust collection bag. When the movable cover closes the dust collection inner cavity, the replaceable dust collection bag can be located in the dust collection inner cavity, and dust in the dust-carrying airflow flowing towards the dust collection inner cavity can be collected inside the replaceable dust collection bag without contaminating the dust collection inner cavity. When the movable cover opens the dust collection inner cavity, the replaceable dust collection bag may follow the movable cover to move to the outside of the dust collection inner cavity. At this point, the interior of the dust collection box can be cleaned by only detaching the replaceable dust collection bag, which collects the dust, from the bagging mechanism, without cleaning the dust collection inner cavity, thus simplifying the cleaning of the interior of the dust collection box, which can both improve cleaning efficiency and improve the user experience.

[0010] In some embodiments of the present disclosure, the movable cover is pivotally installed to the dust collection box, wherein the movable cover switches between a posture of closing the dust collection inner cavity and an posture of opening the dust collection inner cavity by pivoting relative to the dust collection box.

[0011] In some embodiments of the present disclosure, the dust collection assembly further includes a filter installed at the ventilation box wall to form a filtering barrier for the clean airflow flowing out of the ventilation box wall to an outside of the dust collection box.

[0012] In some embodiments of the present disclosure, the replaceable dust collection bag includes a hard dock plate and a soft breathable bag body connected to the hard dock plate; wherein, the dust collection bag opening is provided on the hard dock plate; and a bag cavity of the soft breathable bag body is connected to the dust collection bag opening.

[0013] In some embodiments of the present disclosure, the replaceable dust collection bag is installed to the bagging mechanism in a flat and compressed form with the soft breathable bag body folded against the hard

dock plate; wherein, the soft breathable bag body has a breathable characteristic that forms a preset wind resistance to the dust-carrying airflow, such that: the soft breathable bag body folded against the hard dock plate is expanded and stretched within the dust collection inner cavity in response to the dust-carrying airflow that is poured through the dust collection bag opening.

[0014] In some embodiments of the present disclosure, the bagging mechanism includes pluggable sliding rails arranged at opposite sides of the dust collection air opening; the hard dock plate enables a detachable installation of the replaceable dust collection bag to the bagging mechanism through sliding-fit with the pluggable sliding rails.

[0015] In some embodiments of the present disclosure, the bagging mechanism further includes a reinforced rib frame arranged around the dust collection air opening; the reinforced rib frame supports the hard dock plate slid into the pluggable sliding rails such that there is a gap between the hard dock plate and a cover surface of the movable cover, and the reinforced rib frame forms an airtight airflow passage between the dust collection bag opening and the dust collection air opening within the gap.

[0016] In some embodiments of the present disclosure, the pluggable sliding rails are parallel to a cover surface of the movable cover; a reinforced rib flange projecting from the cover surface is arranged at edges of the movable cover; the bagging mechanism further includes sliding rail flares located at ends of the pluggable sliding rails, to enable the hard dock plate to slide into or disengage from the pluggable sliding rails in a tilted posture avoiding the reinforced rib flange.

[0017] In some embodiments of the present disclosure, the replaceable dust collection bag further includes a soft plate lug extending from the hard dock plate; wherein, when the hard dock plate is inserted into the sliding rail flares in the tilted posture avoiding the reinforced rib flange, the hard dock plate is slid into the pluggable sliding rails in response to an external tension force on the soft plate lug.

[0018] Embodiments of a second aspect of the present disclosure provide a sweeping robot. The sweeping robot includes a movable chassis, and a suction assembly and a cleaning assembly which are carried on the movable chassis. The sweeping robot further includes a dust collection assembly in any one of the foregoing embodiments, wherein:

at any position in a movable range of the movable chassis, the suction assembly drives and forms the dust carrying-airflow flowing from the cleaning assembly to the dust collection air opening of the dust collection assembly.

Brief Description of the Drawings

[0019] The following accompanying drawings are only used for schematic illustrations and explanations of the

present disclosure and do not limit the scope of the present disclosure:

Fig. 1 is a schematic exploded diagram of a dust collection assembly of a sweeping robot in an embodiment of the present disclosure;

Figs. 2a and 2b are schematic assembly structure diagrams of the dust collection assembly as shown in Fig. 1;

Fig. 3 is a schematic structure diagram of a replaceable dust collection bag used in the dust collection assembly as shown in Fig. 1;

Fig. 4 is a schematic principle diagram of the installation of the replaceable dust collection bag to the dust collection assembly as shown in Fig. 1;

Fig. 5 is a schematic operating state diagram of the dust collection assembly as shown in Fig. 1;

Fig. 6 is a schematic principle diagram of detaching the replaceable dust collection bag of the dust collection assembly as shown in Fig. 1;

Fig. 7 is a schematic structure diagram of a hard dock plate of the replaceable dust collection bag used in the dust collection assembly as shown in Fig. 1;

Fig. 8 is a schematic preferred structure diagram of a bagging mechanism for fitting the dust collection assembly as shown in Fig. 1 to the dock plate as shown in Fig. 7;

Fig. 9 is a section view of the dust collection assembly as shown in Fig. 1 when the bagging mechanism as shown in Fig. 7 is inserted with the hard dock plate as shown in Fig. 7;

Fig. 10 is an exemplary schematic structure diagram of the sweeping robot of an embodiment of the present disclosure.

LIST OF REFERENCE NUMBERS:

[0020]

- 10: Rolling brush housing;
- 110: Housing inner cavity;
- 130: Scrolling window;
- 150: Suction air opening;
- 30: Rotable rolling brush;

3 10: Rotating shaft of the rolling brush;
 330: Rolling brush fan;
 50: Dust collection box;
 500: Dust collection inner cavity;
 510: Inner cavity opening;
 520: Ventilation box wall;
 550: Pivoting bracket;
 560: Closing clip;
 60: Movable cover;
 600: Dust collection air opening;
 610: Bagging mechanism;
 611: Pluggable sliding rail;
 612: Sliding rail flare;
 613: Reinforced rib frame;
 650: Pivoting leg;
 660: Closing slot;
 670: Reinforced rib flange;
 70: Filter;
 80: Replaceable dust collection bag;
 800: Dust collection bag opening;
 810: Hard dock plate;
 820: Soft breathable bag body;
 830: Soft plate lug;
 90: Dust;
 91: Dust-carrying airflow;
 92: Clean airflow.

Detailed Description

[0021] In order to make the objects, technical solutions and advantages of the present application more clear, the present disclosure will be further described in detail below with reference to the appended drawings and em-

bodiments.

[0022] Fig. 1 is a schematic exploded diagram of a dust collection assembly of a sweeping robot in an embodiment of the present disclosure. Figs. 2a and 2b are schematic assembly structure diagrams of the dust collection assembly as shown in Fig. 1. Fig. 3 is a schematic structure diagram of a replaceable dust collection bag used in the dust collection assembly as shown in Fig. 1. Fig. 4 is a schematic principle diagram of the installation of the replaceable dust collection bag to the dust collection assembly as shown in Fig. 1. Fig. 5 is a schematic operating state diagram of the dust collection assembly as shown in Fig. 1. Fig. 6 is a schematic principle diagram of a detaching the replaceable dust collection bag of the dust collection assembly as shown in Fig. 1. Referring to Fig. 1 and in combination with Figs. 2a and 2b as well as Figs. 3-6, in this embodiment, the dust collection assembly of the sweeping robot may include a dust collection box 50 and a movable cover 60.

[0023] Embodiments of a first aspect of the present disclosure provide a dust collection assembly of a sweeping robot. The dust collection box 50 in the dust collection assembly can be installed to the sweeping robot and is detachable from the sweeping robot. In the embodiments, the dust collection box 50 has a dust collection inner cavity 500, and the dust collection box 50 further has an inner cavity opening 510 which is connected to the dust collection inner cavity 500.

[0024] The dust collection box 50 also has a ventilation box wall 520 which is connected to the dust collection inner cavity 500 to allow an airflow to flow through the dust collection inner cavity 500. For example, the ventilation box wall 520 may be arranged opposite the inner cavity opening 510. Furthermore, preferably, the ventilation box wall 520 may be installed with a filter 70.

[0025] The movable cover 60 can close the dust collection inner cavity 500 at the inner cavity opening 510 or can be separated from the inner cavity opening 510 to open the dust collection inner cavity 500. Preferably, in order to enable the movable cover 60 to be integrated in the dust collection box 50, the movable cover 60 can be pivotally installed to the dust collection box 50, and the movable cover 60 can be pivoted relative to the dust collection box 50 to switch between a state of closing the dust collection inner cavity 500 and a state of opening the dust collection inner cavity 500. Moreover, in the state of closing the dust collection inner cavity 500, the movable cover 60 may be snap-locked with the dust collection box 50.

[0026] For example, in Figs. 1, 2a and 4-6, the dust collection box 50 may have a pivoting bracket 550. The movable cover 60 has a pivoting leg 650 that coordinates with the pivoting bracket 550, and the movable cover 60 may be pivotally installed to the dust collection box 50 via a pivoting connection of the pivoting leg 650 with respect to the pivoting bracket 550. However, it should be understood that the manner in which the movable cover 60 is pivotally installed to the dust collection box 50 may

not be limited to this.

[0027] Moreover, in Figs. 1, 2a and 4-6, the dust collection box 50 may have a closing clip 560. The movable cover 60 may have a closing slot 660. By snap-fit of the closing clip 560 with the closing slot 660, the movable cover 60, which closes the dust collection inner cavity 500 at the inner cavity opening 510, may be snap-locked with the dust collection box 50.

[0028] Regardless of the assembly manner between the movable cover 60 and the dust collection box 50, the movable cover 60 may have a dust collection air opening 600 that is used for connecting to a cleaning assembly of the sweeping robot to receive a dust-carrying airflow 91 transmitted from the cleaning assembly. In the present disclosure, the dust-carrying airflow 91 refers to an airflow carrying dust, and the dust described herein may include powders, debris, particles, and other dirt capable of moving with the flow of the airflow.

[0029] Referring to Fig. 4, the movable cover 60 may also have a bagging mechanism 610 that is used for installing the replaceable dust collection bag 80. It should be understood that the replaceable dust collection bag 80 is installed to the bagging mechanism 610 in a detachable manner to facilitate a replacement of the replaceable dust collection bag 80. When the replaceable dust collection bag 80 is installed to the bagging mechanism 610, the dust collection bag opening 800 of the replaceable dust collection bag 80 is docked with the dust collection air opening 600.

[0030] When the movable cover 60 closes the dust collection inner cavity 500 of the dust collection box 50 at the inner cavity opening 510 at which the dust collection box 50 is covered, the replaceable dust collection bag 80 is located in the interior of the dust collection inner cavity 500 of the dust collection box 50, as shown in Fig. 5.

[0031] If the dust collection box 50 is installed in the sweeping robot at this time, the dust-carrying airflow 91 from the cleaning assembly of the sweeping robot may flow from the dust collection air opening 600 toward the interior of the dust collection inner cavity 500 of the dust collection box 50, and the dust-carrying airflow 91 flowing from the dust collection air opening 600 toward the interior of the dust collection inner cavity 500 of the dust collection box 50 may be poured into the dust collection bag 80 through the dust collection bag opening 800, such that the dust 90 in the dust-carrying airflow 91 is collected inside the replaceable dust collection bag 80.

[0032] Moreover, a clean airflow 92 can flow through and seep out from the replaceable dust collection bag 80. The clean airflow 92 can be regarded as a dust-removing airflow seeped out after the dust 90 in the dust-carrying airflow 91 has been filtered by the replaceable dust collection bag 80. The clean airflow 92 can flow out of the dust collection box 50 through the ventilation box wall 520. If the ventilation box wall 520 is installed with a filter 70, the filter 70 can form a filtering barrier. When the clean airflow 92 flows out of the dust collection box 50 through the ventilation box wall 520, the filtering barrier

performs a secondary clean filtration of the airflow. It should be understood that the replaceable dust collection bag 80 may be made of a breathable material, such as a non-woven fabric. Since the replaceable dust collection bag 80 is breathable, it may also be referred as a replaceable breathable dust collection bag.

[0033] As can be seen, by utilizing the replaceable dust collection bag 80 to collect dust 90 in the dust collection inner cavity 500, the contamination of the dust collection inner cavity 500 can be prevented.

[0034] When the movable cover 60 is separated from the inner cavity opening 510 of the dust collection box 50 to open the dust collection inner cavity 500 of the dust collection box 50 (e.g., after the dust collection box 50 is detached from the sweeping robot, the snap-fit of the closing clip 560 with the closing slot 660 is unlocked and the movable cover 60 is separated from the inner cavity opening 510 by flipping the movable cover 60), as shown in Fig. 6, the replaceable dust collection bag 80 may follow the movable cover 60 separated from the inner cavity opening 510 to move from the inner cavity opening 510 to the outside of the dust collection inner cavity 500 of the dust collection box 50. At this time, the interior of the dust collection box 50 can be cleaned by only detaching the replaceable dust collection bag 80, which collects the dust, from the bagging mechanism 610 of the movable cover 60, without cleaning the dust collection inner cavity 500 of the dust collection box 50, thus simplifying the cleaning of the interior of the dust collection box, which can both improve cleaning efficiency and improve the user experience.

[0035] Furthermore, if the ventilation box wall 520 of the dust collection box 50 is installed with the filter 70, the cleaning frequency of the filter 70 is greatly reduced and thus the service life of the filter 70 is improved as the filter 70 is flowed through by the clean airflow 92 with the dust 90 being filtered by the replaceable dust collection bag 80.

[0036] In addition, the replaceable dust collection bag 80 detached from the bagging mechanism 610 of the movable cover 60 may be directly discarded. In order to avoid environmental pollution caused by the replaceable dust collection bag 80, in this embodiment, the replaceable dust collection bag 80 may be made of a biodegradable material, e.g., the replaceable dust collection bag 80 may be made of recycled paper.

[0037] Fig. 7 is a schematic structure diagram of a hard dock plate of the replaceable dust collection bag used in the dust collection assembly as shown in Fig. 1. Referring to Fig. 7, in this embodiment, the replaceable dust collection bag 80 may include a hard dock plate 810 and a soft breathable bag body 820 connected to the hard dock plate 810.

[0038] The hard dock plate 810 and the soft breathable bag body 820 may be made of a biodegradable material.

[0039] The dust collection bag opening 800 of the replaceable dust collection bag 800 may be provided on the hard dock plate 810, and the bag cavity of the soft

breathable bag body 820 may be connected to the dust collection bag opening 800.

[0040] Referring to Figs. 4 and 7, the replaceable dust collection bag 80 can be installed in the bagging mechanism 610 in a flat and compressed form with the soft breathable bag body 820 folded against the hard dock plate 810, wherein the soft breathable bag body 820 has a breathable characteristic that forms a preset wind resistance to the dust-carrying airflow such that the soft breathable bag body 820 folded against the hard dock plate 810 is expanded and stretched within the dust collection inner cavity 500 in responsive to the dust-carrying airflow 91 that is poured through the dust collection bag opening 800, as shown in Figs. 5 and 6.

[0041] Fig. 8 is a schematic preferred structure diagram of a bagging mechanism that fits the dust collection assembly as shown in Fig. 1 to the dock plate as shown in Fig. 7. Fig. 9 is a section view of the dust collection assembly as shown in Fig. 1 when the bagging mechanism as shown in Fig. 7 is installed with the hard dock plate as shown in Fig. 7. Referring to Figs. 8 and 9, in this embodiment, the bagging mechanism 610 may include pluggable sliding rails 611 arranged at opposite sides of the dust collection air opening 600 of the movable cover 60.

[0042] For example, the pluggable sliding rails 611 may extend in a direction perpendicular to the pivot axis of the movable cover 60 with respect to the dust collection box 50, and the pluggable sliding rails 611 may be parallel to the cover surface at one side of the movable cover 60 facing the dust collection inner cavity 500.

[0043] Accordingly, the hard dock plate 810 enables the detachable installation of the replaceable dust collection bag 80 to the bagging mechanism 610 through a sliding-fit with the pluggable sliding rails 611.

[0044] In some embodiments, the bagging mechanism 610 may further include a reinforced rib frame 613 arranged around the dust collection air opening 600. The reinforced rib frame 613 may project from the cover surface at one side of the movable cover 60 facing the dust collection inner cavity 500, such that the reinforced rib frame 613 may support the hard dock plate 810 slid into the pluggable sliding rails 611 such that there is a gap between the hard dock plate 810 and the cover surface at one side of the movable cover 60 facing the dust collection inner cavity 500. Furthermore, the reinforced rib frame 613 may form an airtight airflow passage between the dust collection bag opening 800 and the dust collection air opening 600 within the gap, thereby ensuring sealing between the dust collection bag opening 800 and the dust collection air opening 600 to avoid leakage of the dust-carrying airflow 91 between the dust collection bag opening 800 and the dust collection air opening 600.

[0045] Referring to Figs. 8 and 9, in order to enhance the overall strength of the movable cover 60, a reinforced rib flange 670 projecting from the cover surface at one side of the movable cover 60 facing the dust collection inner cavity 500 is further arranged at the edge of the

movable cover 60. The reinforced rib flange 670 will form a slight interference hindrance to the pluggability of the hard dock plate 810 to the pluggable sliding rails 611. In this case, the bagging mechanism 610 may further include sliding rail flares 612 located at ends of the pluggable sliding rails 611 (i.e., the ends away from the pivot axis of the movable cover 60 with respect to the dust collection box 50) to enable the hard dock plate 810 to slide into or disengage from the pluggable sliding rails 611 in a tilted posture avoiding the reinforced rib flange 670. Thus, the installation and detachment of the replaceable dust collection bag 80 can be ensured while taking into account the strength of the movable cover 60.

[0046] Furthermore, referring to Figs. 7, 8 and 9, the replaceable dust collection bag 80 may further include a soft plate lug 830 extending from the hard dock plate 810, wherein when the hard dock plate 810 is inserted into the sliding rail flares 612 in the tilted posture avoiding the reinforced rib flange 670, the hard dock plate 810 may be slid into the pluggable sliding rails 611 in response to an external tension on the soft plate lug 830.

[0047] Embodiments of a second aspect of the present disclosure provide a sweeping robot, which may include a movable chassis, and a suction assembly, a cleaning assembly and a dust collection assembly in the preceding embodiments carried on the movable chassis, wherein: at any position in a movable range of the movable chassis, the suction assembly drives and forms the dust-carrying airflow 91 flowing from the cleaning assembly to the dust collection air opening 600 of the dust collection assembly.

[0048] Fig. 10 is an exemplary schematic structure diagram of the sweeping robot in another embodiment. Referring to Fig. 10, the cleaning assembly may include a rolling brush housing 10 and a rotatable rolling brush 30.

[0049] The rolling brush housing 10 may have a housing inner cavity 110, which may have a scrolling window 130 and a suction air opening 150 arranged with a preset phase deviation relative to the scrolling window 130.

[0050] A portion of the rotatable rolling brush 30 may be located within the housing inner cavity 110, and the other portion thereof may protrude from the scrolling window 130 outside of the housing inner cavity 110.

[0051] Specifically, the rotatable rolling brush 30 may include a rotating shaft 310 of the rolling brush and rolling brush fans 330 distributed on an periphery of the rotating shaft 310 of the rolling brush, wherein the rolling brush fans 330 may be arranged to be spaced apart around an axial direction of the rotating shaft 310 of the rolling brush, and wherein the rolling brush fans 330 may be obliquely arranged with respect to the axial direction of the rotating shaft 310 of the rolling brush. When the rotating shaft 310 of the rolling brush is driven to rotate, the rolling brush fans 330 may be cyclically flipped around an axis of the rotating shaft 310 of the rolling brush to brush up the dust 90 from the floor into the housing inner cavity 110.

[0052] The dust 90 that is brushed up may be drawn out of the suction air opening 150 by a suction assembly

(not shown in the drawings) of the sweeping robot, thereby forming a dust-carrying airflow 91 that flows towards the dust collection air opening 600 of the dust collection assembly.

[0053] The above descriptions are only preferred embodiments of the present disclosure and are not intended to limit the present disclosure. Any modifications, equivalent replacements, improvements, and the like made within the spirit and principles of the present disclosure shall be included within the scope of protection of the present disclosure.

Claims

1. A dust collection assembly of a sweeping robot, wherein the dust collection assembly comprises:

a dust collection box (50), which has a dust collection inner cavity (500) and also has an inner cavity opening (510) and a ventilation box wall (520) which are both connected to the dust collection inner cavity (500); and

a movable cover (60), which has a dust collection air opening (600) and also has a bagging mechanism (610);

wherein, the bagging mechanism (610) is configured for detachably installing a replaceable dust collection bag (80), and enabling a dust collection bag opening (800) of the replaceable dust collection bag (80) to be docked with the dust collection air opening (600);

when the movable cover (60) closes the dust collection inner cavity (500) at the inner cavity opening (510), the replaceable dust collection bag (80) is located in an interior of the dust collection inner cavity (500), such that a dust-carrying airflow flowing from the dust collection air opening (600) to the interior of the dust collection inner cavity (500) is poured into the dust collection bag (80) from the dust collection bag opening (800), wherein, dust (90) in the dust-carrying airflow (91) is collected inside the replaceable dust collection bag (80), and a clean airflow (92) that flows through and seep out from the replaceable dust collection bag (80) flows out of the dust collection box (50) through the ventilation box wall (520);

when the movable cover (60) leaves the inner cavity opening (510) to open the dust collection inner cavity (500), the replaceable dust collection bag (80) follows the movable cover (60) to move from the inner cavity opening (510) to an outside of the dust collection inner cavity (500).

2. The dust collection assembly as claimed in claim 1, wherein, the movable cover (60) is pivotally installed to the dust collection box (50), wherein the movable

cover (60) switches between a posture of closing the dust collection inner cavity (500) and a posture of opening the dust collection inner cavity (500) by pivoting relative to the dust collection box (50).

3. The dust collection assembly as claimed in claim 1, wherein, the dust collection assembly further comprises a filter (70) installed at the ventilation box wall (520) to form a filtering barrier for the clean airflow (92) flowing out of the ventilation box wall (520) to an outside of the dust collection box (50).

4. The dust collection assembly as claimed in claim 1, wherein,

the replaceable dust collection bag (80) comprises a hard dock plate (810) and a soft breathable bag body (820) connected to the hard dock plate (810);

wherein, the dust collection bag opening (800) is provided on the hard dock plate (810); and a bag cavity of the soft breathable bag body (820) is connected to the dust collection bag opening (800).

5. The dust collection assembly as claimed in claim 4, wherein,

the replaceable dust collection bag (80) is installed to the bagging mechanism (610) in a flat and compressed form with the soft breathable bag body (820) folded against the hard dock plate (810);

wherein, the soft breathable bag body (820) has a breathable characteristic that forms a preset wind resistance to the dust-carrying airflow, such that:

the soft breathable bag body (820) folded against the hard dock plate (810) is expanded and stretched within the dust collection inner cavity (500) in response to the dust-carrying airflow (91) that is poured through the dust collection bag opening (800).

6. The dust collection assembly as claimed in claim 4, wherein,

the bagging mechanism (610) comprises pluggable sliding rails (611) arranged at opposite sides of the dust collection air opening (600); the hard dock plate (810) enables a detachable installation of the replaceable dust collection bag (80) to the bagging mechanism (610) through sliding-fit with the pluggable sliding rails (611).

7. The dust collection assembly as claimed in claim 6, wherein,

the bagging mechanism (610) further comprises a reinforced rib frame (613) arranged around the dust collection air opening (600);
 the reinforced rib frame (613) supports the hard dock plate (810) slid into the pluggable sliding rails (611) such that there is a gap between the hard dock plate and a cover surface of the movable cover (60), and the reinforced rib frame (613) forms an airtight airflow passage between the dust collection bag opening (800) and the dust collection air opening (600) within the gap.

8. The dust collection assembly as claimed in claim 6, wherein,

the pluggable sliding rails (611) are parallel to a cover surface of the movable cover (60);
 a reinforced rib flange (670) projecting from the cover surface is arranged at edges of the movable cover (60);
 the bagging mechanism (610) further comprises sliding rail flares (612) located at ends of the pluggable sliding rails (611), to enable the hard dock plate (810) to slide into or disengage from the pluggable sliding rails (611) in a tilted posture avoiding the reinforced rib flange (670).

9. The dust collection assembly as claimed in claim 8, wherein,

the replaceable dust collection bag (80) further comprises a soft plate lug (830) extending from the hard dock plate (810);
 wherein, when the hard dock plate (810) is inserted into the sliding rail flares (612) in the tilted posture avoiding the reinforced rib flange (670), the hard dock plate (810) is slid into the pluggable sliding rails (611) in response to an external tension force on the soft plate lug (830).

10. A sweeping robot, wherein the sweeping robot comprises a movable chassis, and a suction assembly, a cleaning assembly and a dust collection assembly as claimed in any one of claims 1 to 9 which are carried on the movable chassis, wherein:
 at any position in a movable range of the movable chassis, the suction assembly drives and forms the dust carrying-airflow (91) flowing from the cleaning assembly to the dust collection air opening (600) of the dust collection assembly.

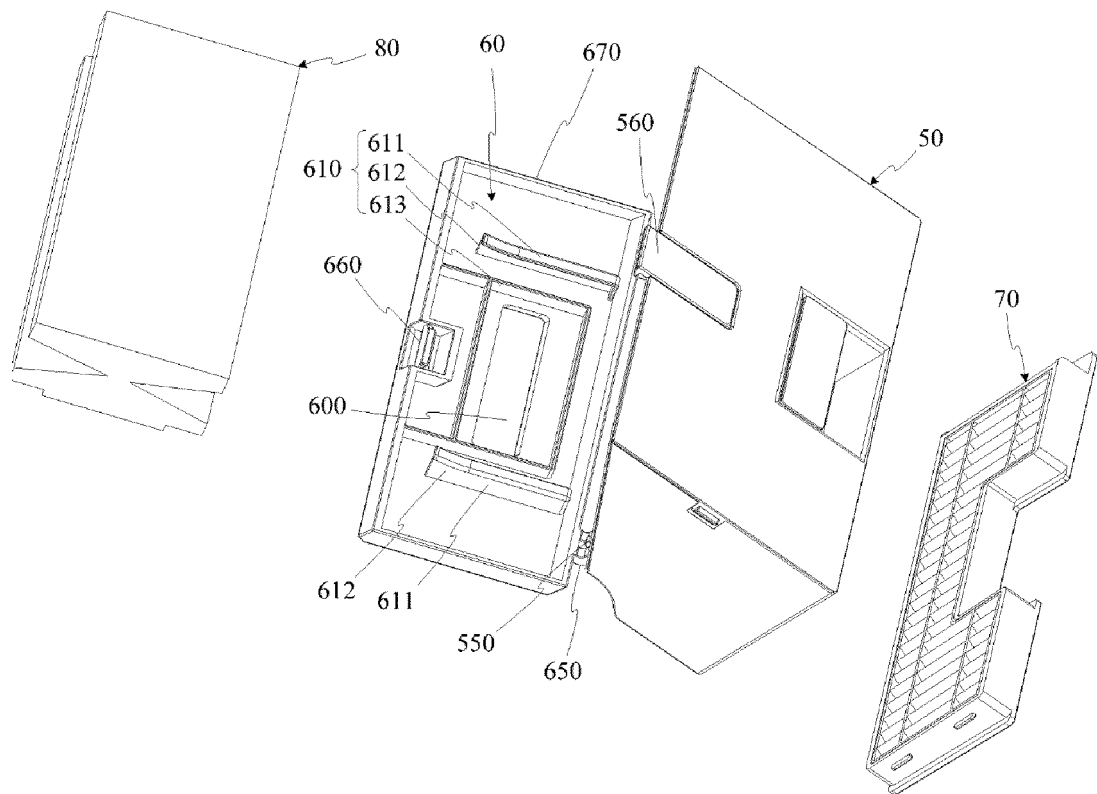


Fig. 1

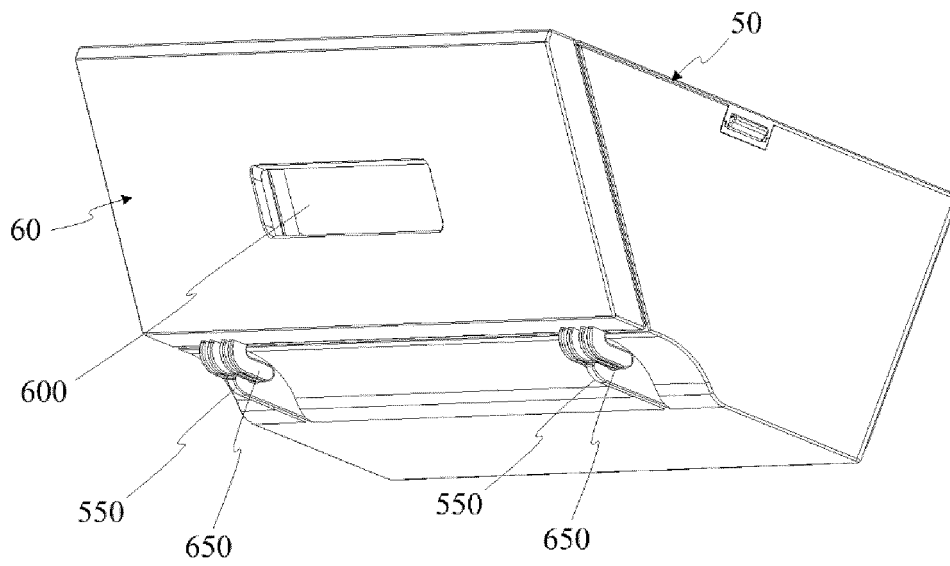


Fig. 2a

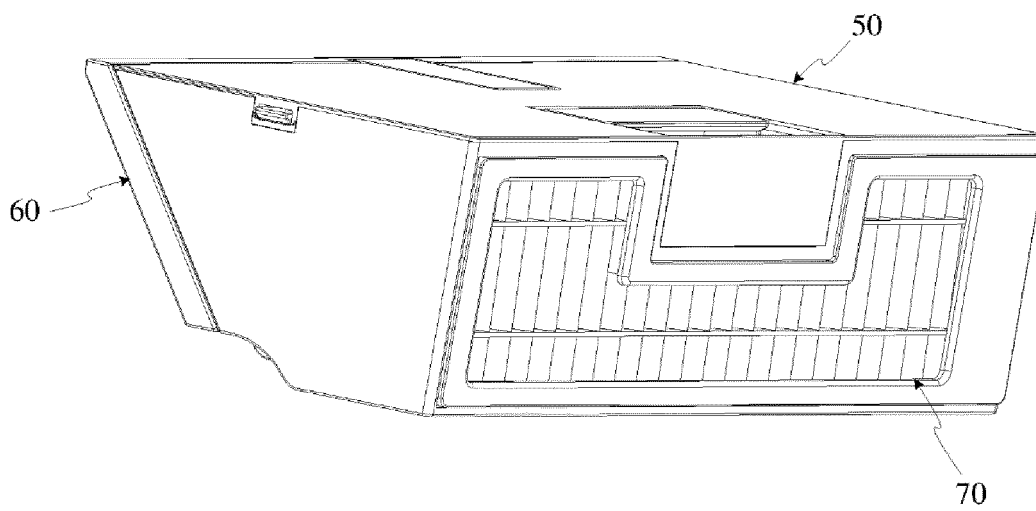


Fig. 2b

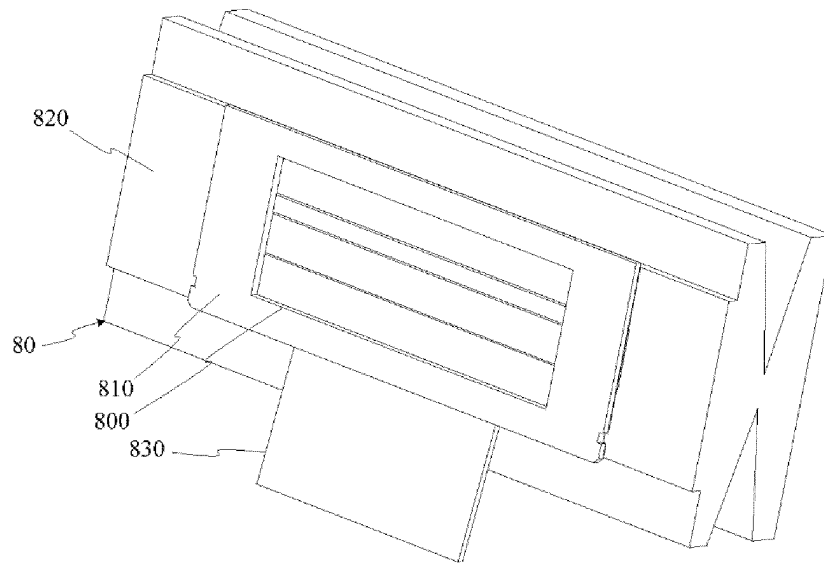


Fig. 3

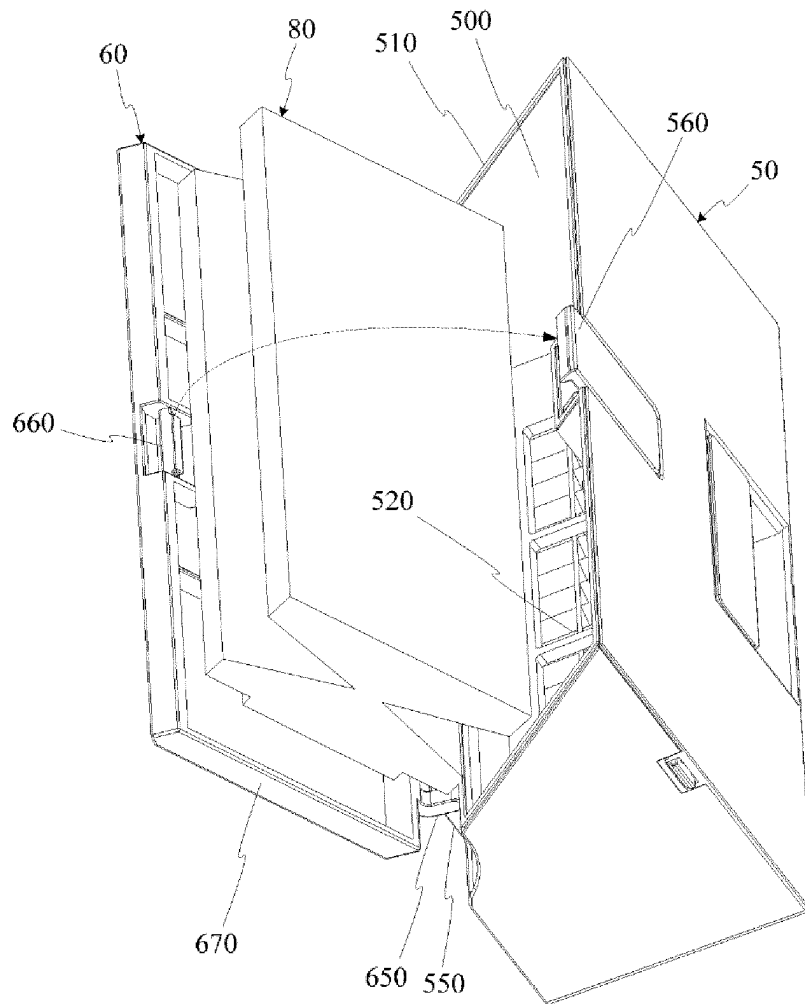


Fig. 4

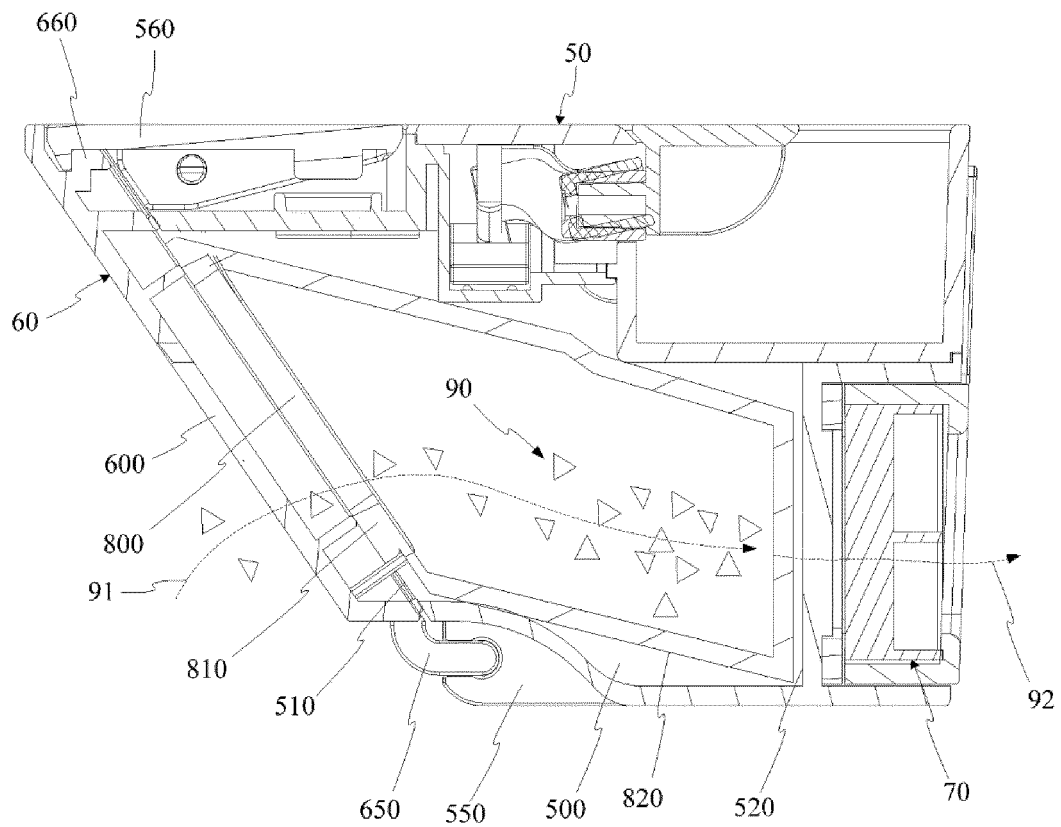


Fig. 5

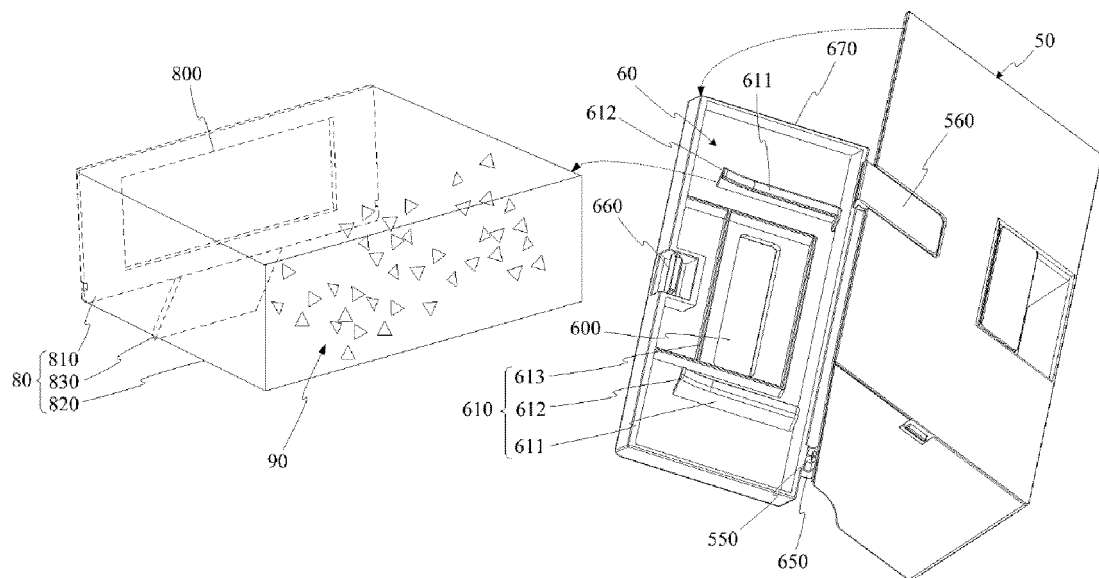


Fig. 6

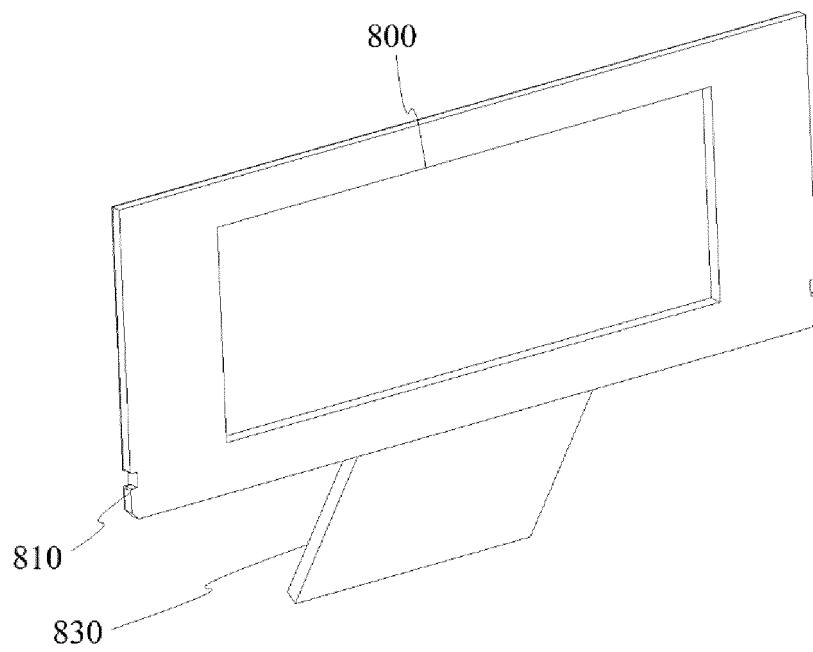


Fig. 7

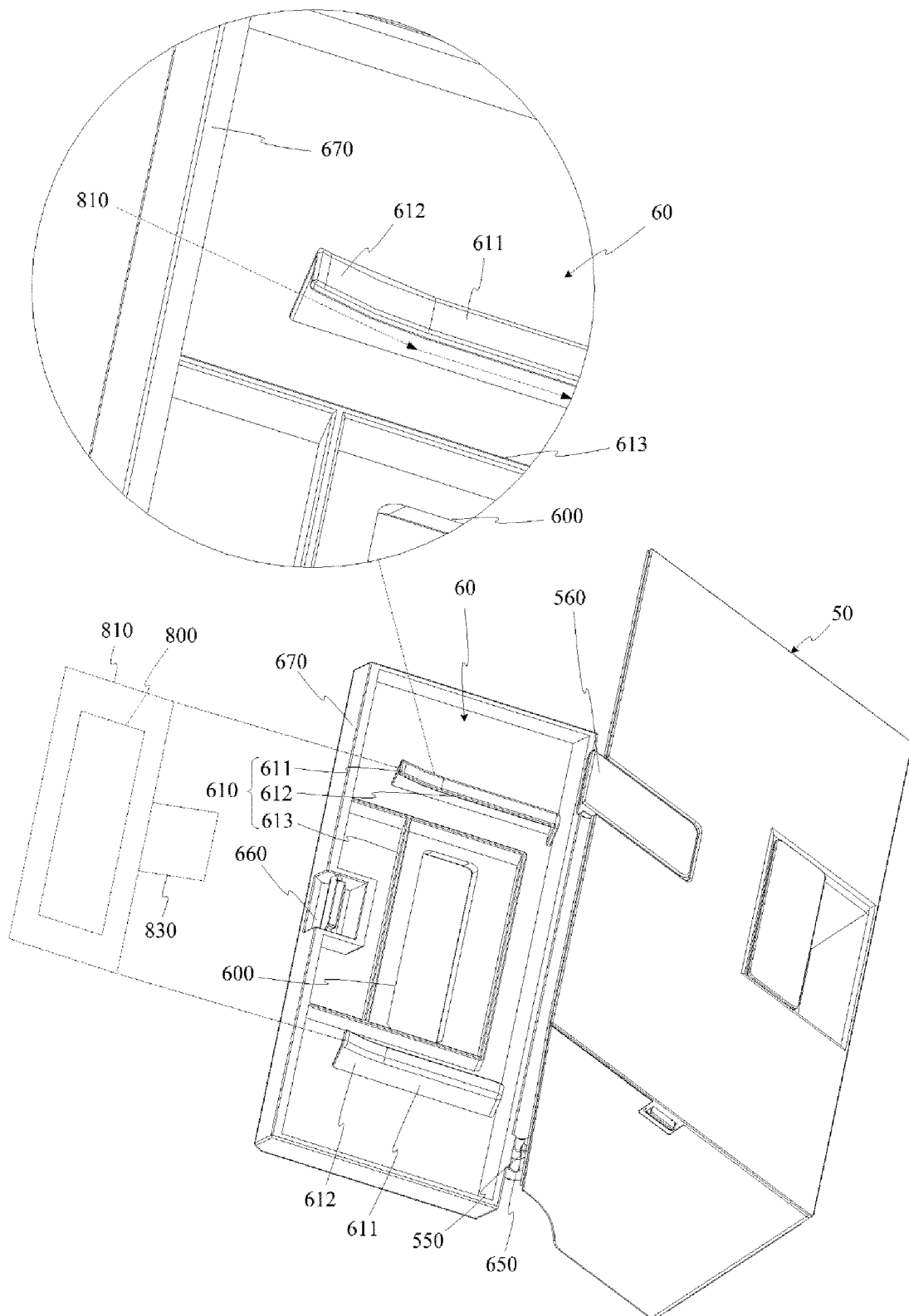


Fig. 8

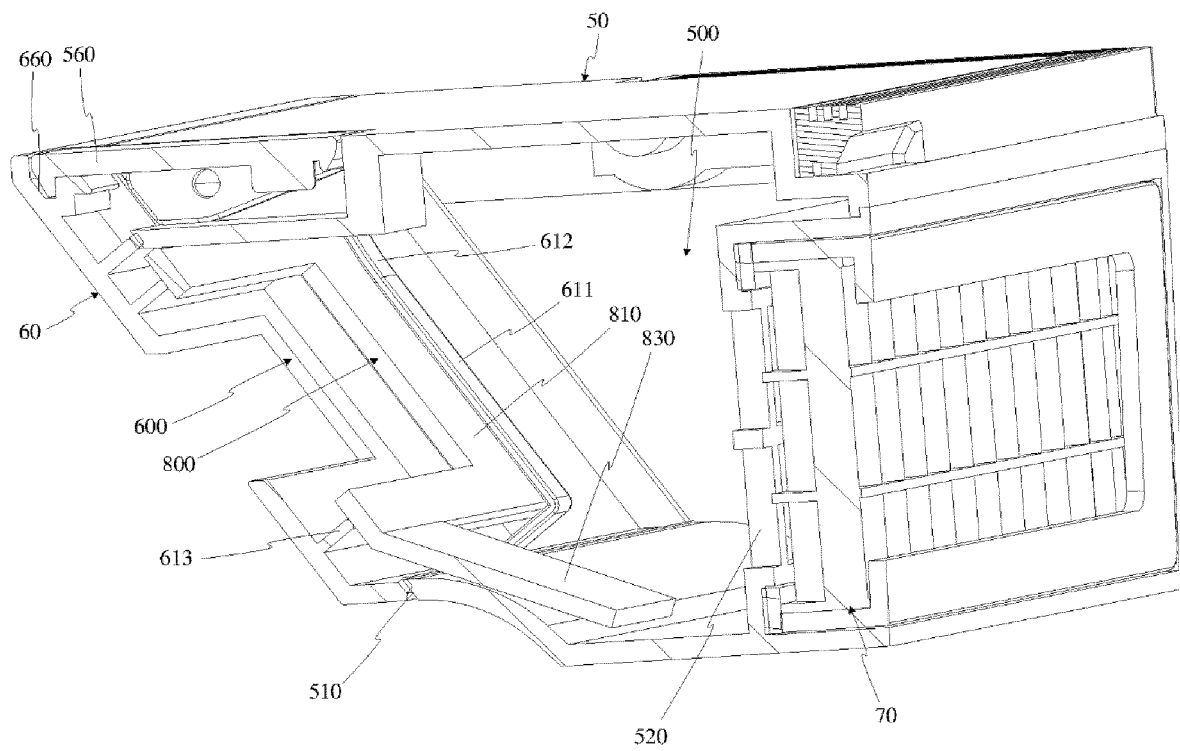


Fig. 9

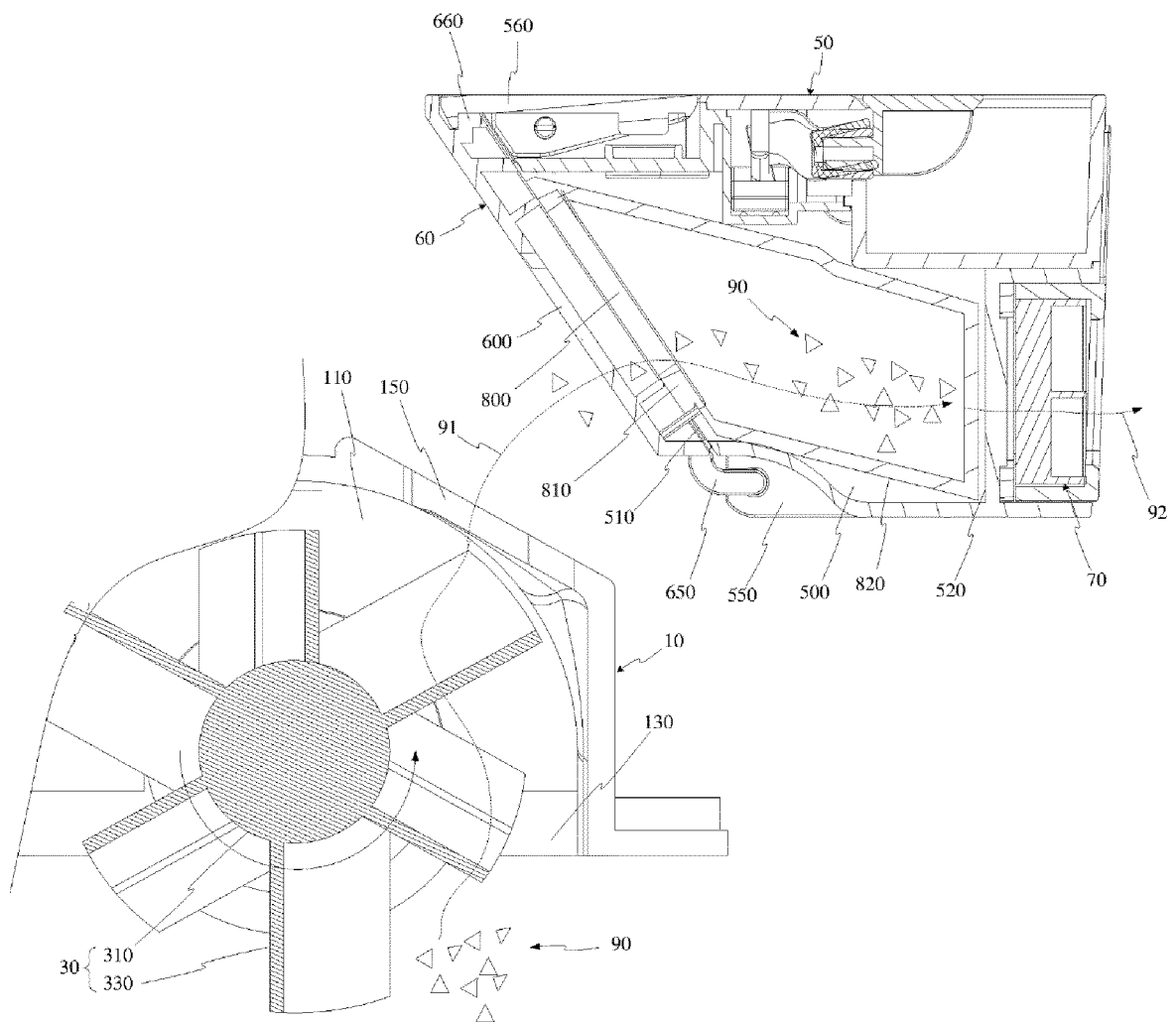


Fig.10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/108266

A. CLASSIFICATION OF SUBJECT MATTER A47L 9/14(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																					
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched																					
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNTXT, CNABS, CNKI, WPABS, DWPI, ENTXT: 尘, 袋, 盒, 腔, 室, 安装, 槽, 盖, 门, 拆卸, 更换, 替换, 过滤, dust, box, cavity, bag, sack, set+, mount+, fix+, groove, cover, door, detach+, chang+, remov+, filtrat+, filter																					
C. DOCUMENTS CONSIDERED TO BE RELEVANT																					
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>CN 202932857 U (PANASONIC HOME APPLIANCES R&D CENTER (HANGZHOU) CO., LTD.) 15 May 2013 (2013-05-15) description, paragraphs 0032-0040, and figures 1-11</td> <td>1-10</td> </tr> <tr> <td>Y</td> <td>CN 210931177 U (SHENZHEN FREE DYNAMICS DEVELOPMENT CO., LTD.) 07 July 2020 (2020-07-07) description, paragraphs 0026-0051, and figures 1-9</td> <td>1-10</td> </tr> <tr> <td>Y</td> <td>US 2009223188 A1 (SAMSUNG GWANGIU ELECTRONICS CO.) 10 September 2009 (2009-09-10) description, paragraphs 0038-0075, and figures 1-9</td> <td>3, 10</td> </tr> <tr> <td>Y</td> <td>JP H08131376 A (TEC CORP.) 28 May 1996 (1996-05-28) description, paragraphs 0007-0025, and figures 1-8</td> <td>3, 10</td> </tr> <tr> <td>PX</td> <td>CN 113475975 A (HANGZHOU FLUORITE SOFTWARE CO., LTD.) 08 October 2021 (2021-10-08) claims 1-10, description paragraphs 0064-0097, and figures 1-10</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>US 2006191416 A1 (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.) 31 August 2006 (2006-08-31) entire document</td> <td>1-10</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	CN 202932857 U (PANASONIC HOME APPLIANCES R&D CENTER (HANGZHOU) CO., LTD.) 15 May 2013 (2013-05-15) description, paragraphs 0032-0040, and figures 1-11	1-10	Y	CN 210931177 U (SHENZHEN FREE DYNAMICS DEVELOPMENT CO., LTD.) 07 July 2020 (2020-07-07) description, paragraphs 0026-0051, and figures 1-9	1-10	Y	US 2009223188 A1 (SAMSUNG GWANGIU ELECTRONICS CO.) 10 September 2009 (2009-09-10) description, paragraphs 0038-0075, and figures 1-9	3, 10	Y	JP H08131376 A (TEC CORP.) 28 May 1996 (1996-05-28) description, paragraphs 0007-0025, and figures 1-8	3, 10	PX	CN 113475975 A (HANGZHOU FLUORITE SOFTWARE CO., LTD.) 08 October 2021 (2021-10-08) claims 1-10, description paragraphs 0064-0097, and figures 1-10	1-10	A	US 2006191416 A1 (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.) 31 August 2006 (2006-08-31) entire document	1-10
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																			
Y	CN 202932857 U (PANASONIC HOME APPLIANCES R&D CENTER (HANGZHOU) CO., LTD.) 15 May 2013 (2013-05-15) description, paragraphs 0032-0040, and figures 1-11	1-10																			
Y	CN 210931177 U (SHENZHEN FREE DYNAMICS DEVELOPMENT CO., LTD.) 07 July 2020 (2020-07-07) description, paragraphs 0026-0051, and figures 1-9	1-10																			
Y	US 2009223188 A1 (SAMSUNG GWANGIU ELECTRONICS CO.) 10 September 2009 (2009-09-10) description, paragraphs 0038-0075, and figures 1-9	3, 10																			
Y	JP H08131376 A (TEC CORP.) 28 May 1996 (1996-05-28) description, paragraphs 0007-0025, and figures 1-8	3, 10																			
PX	CN 113475975 A (HANGZHOU FLUORITE SOFTWARE CO., LTD.) 08 October 2021 (2021-10-08) claims 1-10, description paragraphs 0064-0097, and figures 1-10	1-10																			
A	US 2006191416 A1 (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.) 31 August 2006 (2006-08-31) entire document	1-10																			
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.																					
<table border="0"> <tr> <td style="vertical-align: top;"> * Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “E” earlier application or patent but published on or after the international filing date “L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) “O” document referring to an oral disclosure, use, exhibition or other means “P” document published prior to the international filing date but later than the priority date claimed </td> <td style="vertical-align: top;"> “T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention “X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone “Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art “&” document member of the same patent family </td> </tr> </table>	* Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “E” earlier application or patent but published on or after the international filing date “L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) “O” document referring to an oral disclosure, use, exhibition or other means “P” document published prior to the international filing date but later than the priority date claimed	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention “X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone “Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art “&” document member of the same patent family																			
* Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “E” earlier application or patent but published on or after the international filing date “L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) “O” document referring to an oral disclosure, use, exhibition or other means “P” document published prior to the international filing date but later than the priority date claimed	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention “X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone “Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art “&” document member of the same patent family																				
Date of the actual completion of the international search 23 September 2022	Date of mailing of the international search report 29 September 2022																				
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451	Authorized officer Telephone No.																				

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No. PCT/CN2022/108266

5

10

15

20

25

30

35

40

45

50

55

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 212186365 U (SKYBEST ELECTRIC APPLIANCE (SUZHOU) CO., LTD.) 22 December 2020 (2020-12-22) entire document	1-10
A	CN 109965798 A (SHENZHEN GALIROBOT CO., LTD.) 05 July 2019 (2019-07-05) entire document	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2022/108266

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 202932857 U	15 May 2013	None	
CN 210931177 U	07 July 2020	None	
US 2009223188 A1	10 September 2009	KR 20090095333 A	09 September 2009
		EP 2098154 A1	09 September 2009
		RU 2008135256 A	27 February 2010
		US 7637973 B2	29 December 2009
		EP 2098154 B1	26 June 2013
		KR 101471026 B1	11 December 2014
JP H08131376 A	28 May 1996	JP 3297224 B2	02 July 2002
CN 113475975 A	08 October 2021	CN 215584017 U	21 January 2022
US 2006191416 A1	31 August 2006	EP 1695649 A1	30 August 2006
		HK 1091706 A1	26 January 2007
		TW 200642653 A	16 December 2006
		DE 602006016031 D1	23 September 2010
		KR 20060095512 A	31 August 2006
		US 7765636 B2	03 August 2010
		EP 1695649 B1	11 August 2010
		KR 100989986 B1	26 October 2010
CN 212186365 U	22 December 2020	WO 2021128888 A1	01 July 2021
CN 109965798 A	05 July 2019	CN 210408290 U	28 April 2020

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 202110947243 [0001]