



(12) **EUROPEAN PATENT APPLICATION**

- (43) Date of publication: **26.02.2025 Bulletin 2025/09**
- (51) International Patent Classification (IPC):
A47L 11/292^(2006.01)
- (21) Application number: **25151696.9**
- (52) Cooperative Patent Classification (CPC):
A47L 11/4091; A47L 11/4041
- (22) Date of filing: **12.04.2021**

(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 (30) Priority: 30.04.2020 CN 202010367636 (62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC: 21796866.8 / 4 144 274 (71) Applicant: Tineco Intelligent Technology Co., Ltd. Suzhou, Jiangsu 215168 (CN)	(72) Inventors: • ZHOU, Chunfeng Suzhou (CN) • YE, Chao Suzhou (CN) (74) Representative: Renaudo, Adrien Hanouar Patendibüroo Käosaar OÜ Tähe 94 50107 Tartu (EE) Remarks: This application was filed on 14.01.2025 as a divisional application to the application mentioned under INID code 62.
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(54) **CLEANING APPARATUS SYSTEM**

- (57) Provided are a tray and a cleaning apparatus system. The tray includes: a tray body (10), where a roller brush accommodation region is arranged on an outer surface of the tray body (10), and a mounting cavity (12) is provided in the tray body (10); and a drying unit (20), where the drying unit (20) is mounted in the mounting cavity (12), and the drying unit (20) runs to perform drying treatment on the roller brush accommodation region and an object in the roller brush accommodation region. The tray may be used with a cleaning machine (30). When the cleaning machine (30) is disposed on the tray, a roller brush (32) on the cleaning machine (30) is located in the roller brush accommodation region, and the drying unit (20) runs to perform drying treatment on the roller brush accommodation region and the object in the roller brush accommodation region. Therefore, the roller brush (32) is prevented from being stored in a humid environment, breeding of bacteria and production of odors are reduced, and the service life of the roller brush (32) is prolonged.

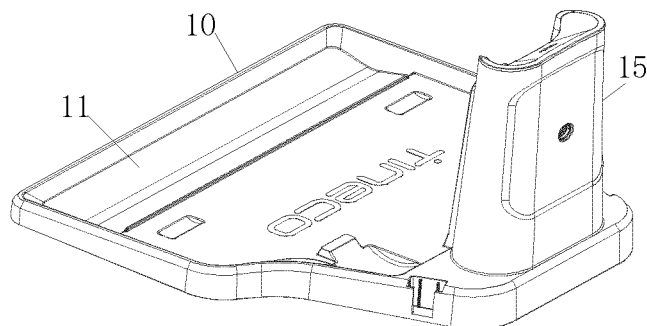


FIG. 1

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present disclosure refers to Chinese Patent Application No. 202010367636.5, filed on April 30, 2020, and entitled "Tray and Cleaning Apparatus System", which is hereby incorporated by reference in its entirety.

TECHNICAL FIELD

[0002] The present disclosure relates to the technical field of machinery, and particularly to a tray and a cleaning apparatus system.

BACKGROUND

[0003] With the development of social productivity, people's living standard has also been improved. With the material basis guaranteed, people begin to use a variety of tools to reduce labor and further improve the quality of life. Cleaning device comes into being. For example, a cleaning machine is a kind of cleaning device. Currently, a cleaning device also has its limitations, and any cleaning device should not appear in a using environment as a source of pollution.

[0004] At present, a cleaning machine in use often needs to be combined with water for cleaning. After a cleaning operation is completed, there is sewage remaining on a rolling brush on the cleaning machine. In order to prevent sewage from flowing to the ground and other cleaning surfaces, the cleaning machine is usually provided with a tray, through which the cleaning machine is stored, and liquid on the roller brush may flow into the tray.

[0005] However, when an existing tray is used with a cleaning machine, part of sewage on a roller brush flow into the tray, while part still remains on the roller brush. As a result, the roller brush is kept in a humid environment for long time, which is prone to breeding of bacteria and production of odors. Consequently, the service life of the roller brush is shortened, and in addition, potential safety hazards are brought to the surrounding.

SUMMARY

[0006] In view of the foregoing problems, embodiments of the present disclosure are disclosed to provide a tray and cleaning apparatus system for solving the foregoing problems. The tray performs drying treatment on a roller brush accommodation region and a roller brush in the roller brush accommodation region through a drying unit, to prevent the roller brush from being stored in a humid environment.

[0007] In an embodiment of the present disclosure, a tray is provided, including:

a tray body, where an outer surface of the tray body is provided with a roller brush accommodation region,

and a mounting cavity is provided in the tray body; and

a drying unit, mounted in the mounting cavity and running to perform drying treatment on the roller brush accommodation region and a roller brush in the roller brush accommodation region.

[0008] Optionally, the drying unit includes a heating apparatus, and a position of the heating apparatus corresponds to a position of the roller brush accommodation region.

[0009] Optionally, the roller brush accommodation region is a roller brush groove, and a heat outlet is formed in the roller brush groove at a position corresponding to the heating apparatus.

[0010] Optionally, a heat conduction water-stop plate is arranged between the heating apparatus and the heat outlet.

[0011] Optionally, the drying unit includes an air outlet apparatus;

the tray body is provided an air outlet facing the roller brush accommodation region; and

a ventilation channel is provided in the mounting cavity, and the air outlet apparatus is communicated with the air outlet through the ventilation channel.

[0012] Optionally, the roller brush accommodation region is a roller brush groove, and the air outlet is located in front of the roller groove and faces a groove opening of the roller brush groove such that an airflow is capable of entering the roller brush groove from the groove opening of the roller brush groove; or

the air outlet is located at a groove bottom of the roller brush groove such that an airflow is capable of entering the roller brush groove from the groove bottom of the roller brush groove.

[0013] Optionally, the tray further includes a detection unit and a control unit; where,

the control unit is electrically connected with the detection unit and the drying unit respectively; and the control unit controls the drying unit to run when the detection unit detects a triggering event.

[0014] Optionally, the tray further includes a timing unit; where,

the timing unit is electrically connected with the control unit, and the control unit controls the timing unit to run while controlling the drying unit to run; and the control unit controls the drying unit to be turned off when a timing length of the timing unit is equal to preset time.

[0015] Correspondingly, the embodiments of the present disclosure also provide a cleaning apparatus system, including a cleaning device and a tray; where,

the cleaning device includes a shell and a roller brush mounted to the shell; and the tray includes:

a tray body, where the tray body is provided with a roller brush accommodation region, the roller brush is located in the roller brush accommodation region when the cleaning device is disposed on the tray, and a mounting cavity is provided in the tray body; and a drying unit, where the drying unit is mounted in the mounting cavity, and the drying unit runs to perform drying treatment on the roller brush accommodation region and the roller brush in the roller brush accommodation region.

[0016] Optionally, the drying unit includes a heating apparatus, and a position of the heating apparatus corresponds to a position of the roller brush accommodation region.

[0017] Optionally, the drying unit includes an air outlet apparatus;

the tray body is provided an air outlet facing the roller brush accommodation region; and
a ventilation channel is provided in the mounting cavity, and the air outlet apparatus is communicated with the air outlet through the ventilation channel.

[0018] Optionally, the roller brush accommodation region is a roller brush groove, the shell includes a roller brush cover, and the roller brush cover is arranged at an outer side of the roller brush in a covering manner; when the cleaning device is disposed on the tray, the roller brush groove and the roller brush cover form an airflow channel for an airflow to flow through along an outer lateral surface of the roller brush; and an air vent is formed in the roller brush cover at a position opposite to the roller brush groove.

[0019] Optionally, the roller brush accommodation region is a roller brush groove, and a suction component is further arranged in the shell; a suction port of the suction component is arranged at a bottom of the shell; the suction port is located in the roller brush groove when the roller brush is located in the roller brush groove; and the suction component runs to perform drying treatment on the roller brush groove and the roller brush in the roller brush groove.

[0020] Correspondingly, the embodiments of the present disclosure also provide a cleaning apparatus system, including a cleaning device and a tray; where,

the cleaning device includes a roller brush; and
the tray includes: a tray body, where the tray body includes a roller brush accommodation region and a mounting cavity; and
a drying unit, where the drying unit is arranged in the mounting cavity, and the drying unit runs to perform drying treatment on the roller brush accommodation region and the roller brush in the roller brush accom-

modation region.

[0021] Correspondingly, the embodiments of the present disclosure also provide a base station, including:

a base station body, where the base station body includes a roller brush accommodation region and a mounting cavity; and
a drying unit, where the drying unit is arranged in the mounting cavity, and the drying unit runs to perform drying treatment on the roller brush accommodation region and a roller brush in the roller brush accommodation region.

[0022] Correspondingly, the embodiments of the present disclosure also provide a cleaning apparatus system, including a cleaning device and a tray; where, the cleaning device includes a roller brush; and

the tray includes a tray body, where the tray body is provided with a roller brush accommodation region, a ventilation channel is provided in the mounting cavity, and a drying unit is arranged in the mounting cavity;
when the cleaning device is located on the tray body, the roller brush is located in the roller brush accommodation region, and the drying unit is aligned with the roller brush accommodation region and the roller brush; and the drying unit runs to perform drying treatment on the roller brush accommodation region and the roller brush.

[0023] According to the technical solutions provided in the embodiments of the present disclosure, the tray may be used with a cleaning machine. When the cleaning machine is disposed on the tray, a roller brush on the cleaning machine is located in the roller brush accommodation region, and the drying unit runs to perform drying treatment on the roller brush accommodation region and the object in the roller brush accommodation region. Therefore, the roller brush is prevented from being stored in a humid environment, breeding of bacteria and production of odors are reduced, the service life of the roller brush is prolonged, and in addition, a strong guarantee is provided for user health.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] In order to describe the technical solutions in the embodiments of the present disclosure or the prior art more clearly, the drawings required to be used in descriptions about the embodiments or the prior art will be introduced briefly below. Apparently, the drawings in the description below are some embodiments of the present disclosure. Those of ordinary skill in the art may further obtain other drawings according to these drawings without creative work.

FIG. 1 is a schematic structural diagram of a tray according to an embodiment of the present disclosure;

FIG. 2 is a schematic diagram of a sectional structure of a tray according to an embodiment of the present disclosure;

FIG. 3 is a schematic section view when a tray is used with a cleaning device according to an embodiment of the present disclosure;

FIG. 4 is a schematic enlarged view of part A in FIG. 3, a schematic diagram of a sectional structure when a drying unit includes a heating apparatus;

FIG. 5 is a schematic enlarged view of part A in FIG. 3, a schematic diagram of a sectional structure when a heat conduction water-stop plate is arranged on the tray;

FIG. 6 is a schematic enlarged view of part A in FIG. 3, a schematic diagram of a sectional structure when a drying unit includes an air outlet apparatus and an air outlet is located in front of a roller brush groove;

FIG. 7 is a schematic enlarged view of part A in FIG. 3, a schematic diagram of a sectional structure when a drying unit includes an air outlet apparatus and an air outlet is located at a bottom of a roller brush groove;

FIG. 8 is a schematic enlarged view of part A in FIG. 3, a schematic diagram of a sectional structure when a drying unit includes an air outlet apparatus, an air outlet is located in front of a roller brush groove, and an air vent is formed in a shell of the cleaning device;

FIG. 9 is a schematic enlarged view of part A in FIG. 3, a schematic diagram of a sectional structure when a drying unit includes an air outlet apparatus, an air outlet is located at a bottom of a roller brush groove, and an air vent is formed in a shell of the cleaning device; and

FIG. 10 is a schematic running flowchart of a tray according to an embodiment of the present disclosure.

DETAILED DESCRIPTION OF EXAMPLE EMBODIMENTS

[0025] In order to enable those skilled in the art to understand the solutions of the present disclosure better, the technical solutions in the embodiments of the present disclosure will be described clearly and completely below in combination with the drawings in the embodiments of the present disclosure.

[0026] In the practice of the embodiments of the present disclosure, the inventor found that, in the prior art, after a cleaning device completes cleaning, a roller brush is generally wet, the cleaning device needs to be stored on a tray, and then liquid on the roller brush may flow into the tray. In next use, the roller brush may still be wet with an odor.

[0027] The applicant found a reason for the foregoing condition is that, after the cleaning device is disposed on

the tray, part of the liquid on the roller brush may flow into the tray, while part still remains on the roller brush. As a result, the roller brush is kept in a humid environment for long time and unlikely to become dry within short time, which is prone to breeding of bacteria and production of odors. Consequently, the service life of the roller brush is shortened, and in addition, potential safety hazards are brought to the surrounding.

[0028] For the foregoing problems, the present disclosure provides a tray and a cleaning apparatus system. The tray performs drying treatment on a roller brush accommodation region and a roller brush in the roller brush accommodation region through a drying unit, to prevent the roller brush from being stored in a humid environment.

[0029] The technical solutions in the embodiments of the present disclosure will be described clearly and completely below in combination with the drawings in the embodiments of the present disclosure. Apparently, the described embodiments are not all but only part of embodiments of the present disclosure. All other embodiments obtained by those skilled in the art based on the embodiments in the present disclosure without creative work shall fall within the scope of protection of the present disclosure.

Embodiment 1

[0030] FIG. 1 is a schematic structural diagram of a tray according to an embodiment of the present disclosure, and FIG. 2 is a schematic diagram of a sectional structure of a tray according to an embodiment of the present disclosure, as shown in FIGs. 1 and 2.

[0031] In an embodiment of the present disclosure, a tray is provided, including a tray body 10 and a drying unit 20. A roller brush accommodation region is arranged on an outer surface of the tray body 10. A mounting cavity 12 is provided in the tray body 10. The drying unit 20 is mounted in the mounting cavity 12. The drying unit 20 runs to perform drying treatment on the roller brush accommodation region and a roller brush in the roller brush accommodation region.

[0032] According to the technical solution provided in the embodiment of the present disclosure, referring to FIGs. 3 and 4, the tray may be used with a cleaning device 30. The cleaning device includes, but not limited to, a cleaning machine. When the cleaning device 30 is disposed on the tray, a roller brush 32 on the cleaning device 30 is located in the roller brush accommodation region, and the drying unit 20 runs to perform drying treatment on the roller brush accommodation region and the roller brush 32 in the roller brush accommodation region. Therefore, the roller brush 32 is prevented from being stored in a humid environment, breeding of bacteria and production of odors are reduced, the service life of the roller brush 32 is prolonged, and in addition, a strong guarantee is provided for user health.

[0033] For example, referring to FIGs. 3 and 4, in the

embodiment of the present disclosure, the tray may be used with a cleaning device 30. The cleaning device 30 includes a shell 31 and a roller brush 32 mounted to the shell 31. A space where the roller brush 32 is located is a roller brush cavity. A position of the roller brush accommodation region is adapted to that of the roller brush 32 of the cleaning device 30. When the cleaning device 30 is disposed on the tray body 10, the roller brush 32 of the cleaning device 30 is located in the roller brush accommodation region. The roller brush 32 of the cleaning device 30 includes, but not limited to, a lint roller brush 32. If liquid remains on the roller brush 32, part of the liquid may flow to the roller brush accommodation region, while part remains on the roller brush 32. The drying unit 20 may be turned on manually by a user or automatically to run to perform drying treatment on the roller brush accommodation region and the roller brush 32 in the roller brush accommodation region. After drying is completed, the roller brush accommodation region is dry, which preventing the roller brush 32 from being stored in a humid environment, and the roller brush 32 is still dry, which avoiding breeding of bacteria and production of odors.

[0034] It is to be noted that, in the embodiment of the present disclosure, the tray may be used as an independent component. Alternatively, as shown in FIG. 3, the tray is used with the cleaning device 30, and the cleaning device 30 and the tray are combined into a cleaning apparatus system. The tray may not only provide a storage function for the cleaning device 30 but also provide a charging function for the cleaning device 30. A charging pile 15 is further arranged on the tray body 10. The charging pile 15 may be electrically connected to a charging power supply. The tray may charge the cleaning device 30 through the charging pile 15 on the tray body 10. The charging pile 15 may also provide electric energy needed by the drying unit 20 to run.

[0035] The cleaning device 30 in FIG. 3 includes a floor brush apparatus of the cleaning device 30. The roller brush 32 is arranged on the floor brush apparatus. Other components include, but not limited to, a handle, a clear water bucket, a recycling bucket, a main motor apparatus, etc. In the embodiment of the present disclosure, the cleaning device 30 includes, but not limited to, the cleaning device 30 shown in FIG. 3, and also includes a self-moving cleaning robot, a handheld vacuum cleaner, a vertical cleaning device, etc. The cleaning device 30 described in the foregoing and following embodiments takes the cleaning device 30 shown in FIG. 3 as an example. It is to be noted that the description made taking the cleaning device 30 shown in FIG. 3 is merely an example and not intended to form improper limitations on the embodiment of the present disclosure.

[0036] In the embodiment of the present disclosure, there are many implementation modes of the drying unit 20. Referring back to FIG. 4, as an implementation mode of the drying unit 20, the drying unit 20 includes a heating apparatus 21, and a position of the heating apparatus 21

corresponds to that of the roller brush accommodation region. When the cleaning device 30 is disposed on the tray body 10 after completing cleaning, the heating apparatus 21 may be turned on automatically or manually by the user. After being turned on, the heating apparatus 21 may continuously heat the roller brush accommodation region. When the heating apparatus 21 heats the roller brush accommodation region, water in the roller brush accommodation region and on the roller brush 32 in the roller brush accommodation region is gradually evaporated by heat, and water vapor is brought out by heat convection, so as to implement drying treatment of the roller brush accommodation region and the roller brush 32. The water vapor generated by heating may be brought out through a gap of the shell 31.

[0037] Further, the shell 31 of the cleaning device 30 includes a roller brush cover 33, and the roller brush cover 33 is arranged at an outer side of the roller brush 32 in a covering manner. In order to make it convenient for the water vapor to leave the roller brush cavity quickly, an air vent 34 is formed in the roller brush cover 33. The water vapor may leave the roller brush cavity quickly through the air vent 34. Furthermore, the air vent 34 is formed at a position corresponding to the roller brush accommodation region. That is, the air vent 34 is located above the roller brush accommodation region. After the water is turned into water vapor by heating, the water vapor may rise gradually and be diffused to an external environment quickly from the air vent 34.

[0038] Specifically, the roller brush accommodation region may be arranged to be a plane structure, a slope structure, a curved structure, or a combination of one or more of these structures. Further, in order to accommodate the roller brush 32 better, the roller brush accommodation region is arranged to be a roller brush groove 11 shown in FIGs. 1, 2, and 4. When the cleaning device 30 is disposed on the tray, the roller brush 32 on the cleaning device 30 is located in the roller brush groove 11, and a position of the drying unit 20 corresponds to that of the roller brush groove 11. The drying unit 20 runs to perform drying treatment on the roller brush groove 11 and the roller brush 32 in the roller brush groove 11.

[0039] Referring back to FIG. 4, in a possible embodiment of the present disclosure, the position of the heating apparatus 21 corresponds to a groove bottom of the roller brush groove 11. In order to better collect the water flowing from the roller brush 32, the groove bottom of the roller brush groove 11 is a lowest point of the roller brush groove 11. As an implementation mode of the roller brush groove 11, the groove bottom of the roller brush groove 11 at least includes two inclined water collection plates. The inclined water collection plate is favorable for guiding water to the lowest point of the roller brush groove 11. A fall surface may be formed in the roller brush groove 11 through the water collection plate, and the water may be guided to the groove bottom of the roller brush groove 11 through the fall surface. The lowest point of the roller brush groove 11 corresponds to a bottom position of the

roller brush 32. For example, each of the two water collection plates is of a straight plate structure, and the two straight plate structures are connected to form a V-like shape with two higher sides and a lower middle, such that the water is convenient to guide to the bottom of the roller brush groove 11. The position of the heating apparatus 21 corresponds to the groove bottom of the roller brush groove 11, namely the heating apparatus 21 is located at the groove bottom of the roller brush groove 11, below the roller brush 32. During heating by the heating apparatus 21, the water accumulated at the groove bottom and below the roller brush 32 may be heated, so as to accelerate evaporation of the water.

[0040] Further, in order to transfer the heat more quickly into the roller brush groove 11, in a possible embodiment of the present disclosure, a heat outlet is formed in the roller brush groove 11 at a position corresponding to the heating apparatus 21. During heating by the heating apparatus 21, heat may be directly transferred into the roller brush groove 11 through the heat outlet. Therefore, the heat loss is reduced, and evaporation of the water is accelerated.

[0041] Furthermore, in order to prevent the water on the roller brush 32 and in the roller brush groove 11 from entering the mounting cavity 12 through the heat outlet to damage the heating apparatus 21, referring to FIG. 5, a heat conduction water-stop plate 22 is arranged between the heating apparatus 21 and the heat outlet. The heat conduction water-stop plate 22 is made from, but not limited to, a metallic material, such as a stainless steel material and a galvanized plate material. The heating apparatus 21 is arranged below the roller brush 32, and then water may drop from the roller brush 32 that is yet not completely dry and enter the mounting cavity 12 below through the heat outlet, so that the tray body 10 is internally humid, and the heating apparatus 21 and the tray body 10 may be damaged. With the arrangement of the heat conduction water-stop plate 22 above the heating apparatus 21, liquid such as water may be effectively prevented from entering the mounting cavity 12 through the heat outlet. In addition, the heat conduction water-stop plate 22 may also transfer the heat of the heating apparatus 21 quickly to accelerate the evaporation of the water in the roller brush groove 11 and on the roller brush 32.

[0042] In the embodiment of the present disclosure, there is another implementation mode of the drying unit 20, besides the foregoing implementation of the drying unit 20 by the heating apparatus 21. Referring to FIGs. 6 and 7, the drying unit 20 includes an air outlet apparatus 23. The air outlet apparatus 23 includes, but not limited to, a fan. An air outlet 13 facing the roller brush accommodation region is formed in the tray body 10. A ventilation channel 14 is provided in the mounting cavity 12. The air outlet apparatus 23 is communicated with the air outlet 13 through the ventilation channel 14. Taking a fan as an example, when the cleaning device 30 is disposed on the tray body 10 after completing cleaning, the fan may be

turned on automatically or manually by a user. After being turned on, the fan may push outside air into the mounting cavity 12 of the tray body 10. After entering the ventilation channel, airflow flows forward to the air outlet 13 along the ventilation channel, and then is blown into the roller brush accommodation region from the air outlet 13.

[0043] Similarly, the roller brush accommodation region may be arranged to be a plane structure, a slope structure, a curved structure, or a combination of one or more of these structures. Further, in order to accommodate the roller brush better, the roller brush accommodation region is arranged to be a roller brush groove 11 shown in FIGs. 1, 2, and 6.

[0044] When the cleaning device 30 is disposed on the tray, the roller brush groove 11 and the roller brush cover 33 form an airflow channel for airflow to flow through along an outer lateral surface of the roller brush 32. The airflow blown out of the air outlet 13 flows through the outer lateral surface of the roller brush 32 along the airflow channel to bring the water away from the roller brush 32. Air circulation in the roller brush groove 11 is improved by the airflow generated by the fan, so as to bring the water out through the airflow to implement air-drying treatment of the roller brush groove 11 and the roller brush 32. The airflow entering the roller brush groove 11 may be blown from the gap of the shell 31. The dashed line in FIGs. 6 and 7 indicates a flow path and direction of the airflow.

[0045] Further, referring to FIGs. 8 and 9, in order to make it convenient for the water to leave the roller brush cavity quickly, an air vent 34 is formed in the roller brush cover 33. The water may leave the roller brush cavity quickly through the air vent 34. The dashed line in FIGs. 8 and 9 indicates a flow path and direction of the airflow.

[0046] Further, in the embodiment of the present disclosure, a position of the air outlet 13 may be set according to different air inlet requirements. As an implementable mode, the air outlet 13 is located in front of the roller brush groove 11 (referring to FIGs. 6 and 8, namely the air outlet 13 is located at a left of the roller brush groove 11) and faces a groove opening of the roller brush groove 11, such that the airflow may enter the roller brush groove 11 from the groove opening of the roller brush groove 11. Taking the orientation in FIGs. 6 and 8 as an example, the air outlet 13 may be formed at a left side of the roller brush groove 11, i.e., a left-side position of the roller brush 32. The left-side position of the roller brush groove 11 is higher than the roller brush groove 11, so the water on the roller brush 32 that is yet not completely dry is prevented from entering the mounting cavity 12 from the air outlet. In addition, liquid such as water may be accumulated at the groove bottom of the roller brush groove 11, and the airflow enters the roller brush groove 11 from the groove opening at a higher position, so that the airflow has a higher impact, and may bring the water away from the roller brush groove 11 and the roller brush 32 along the airflow channel formed by the roller brush groove 11 and the roller brush cover 33.

[0047] As another setting mode for the position of the air outlet 13, referring to FIGs. 7 and 9, the air outlet 13 is located at a groove bottom of the roller brush groove 11, such that the airflow may enter the roller brush groove 11 from the groove bottom of the roller brush groove 11. Taking the orientation in FIGs. 7 and 9 as an example, the air outlet 13 may be formed at the bottom of the roller brush groove 11, i.e., a position below the roller brush 32. Therefore, the air outlet 13 is opposite to the groove bottom of the roller brush groove 11, and a flow path of the airflow is relatively short, effectively reducing the energy loss when the airflow flows. The airflow blown out of the air outlet 13 directly acts on the groove bottom of the roller brush groove 11 and the roller brush 32 with relatively high kinetic energy, and thus may bring the water away from the roller brush groove 11 and the roller brush 32 along the airflow channel formed by the roller brush groove 11 and the roller brush cover 33.

[0048] It is to be noted that the two setting modes for the air outlet may be implemented independently, or may be combined. Further, the heating apparatus 21 and the air outlet apparatus 23 may be implemented independently, or may be combined. When they are combined, the heating apparatus 21 is located in the ventilation channel 14, namely the heating apparatus 21 is located on the flow path of the airflow, hot air is formed after the airflow generated by the air outlet apparatus 23 passes through the heating apparatus 21, and drying treatment of the roller brush accommodation region and the roller brush 32 may be completed quickly under the heating action of the heating apparatus 21 and the air-drying action of the hot air. In some embodiments, according to different requirements, the air vent 34 is formed in the roller brush cover 33, or the air vent 34 is not formed. When the air vent 34 is not formed, the water or the water vapor may be diffused from a combination gap of the roller brush cover 33 and the tray or the gap of the shell 31.

[0049] In the embodiment of the present disclosure, the drying unit 20 may be turned on manually by the user or automatically according to a triggering condition. As an implementation mode of automatic turning-on, the tray further includes a detection unit and a control unit. The control unit is electrically connected with the detection unit and the drying unit 20 respectively. The control unit controls the drying unit 20 to run when the detection unit detects a triggering event. The control unit may be arranged in the charging pile 15. The detection unit may be arranged in the charging pile 15 or on the tray body 10 according to different requirements. For example, the detection unit includes, but not limited to, a pressure sensor, a light sensor, and a magnetic induction sensor. When detecting that the cleaning device 30 is disposed on the tray body 10, the detection unit sends a detection signal to the control unit such that the control unit controls the drying unit 20 to run to perform drying treatment on the roller brush accommodation region and the roller brush 32.

[0050] After the drying treatment of the roller brush 32

is completed, if the drying unit 20 still runs, resources are wasted. In order to avoid this condition, in the embodiment of the present disclosure, the tray further includes a timing unit. The timing unit is electrically connected with the control unit. The control unit controls the timing unit to run while controlling the drying unit 20 to run. The control unit controls the drying unit 20 to be turned off when a timing length of the timing unit is equal to preset time.

[0051] Through the timing unit, the user may preset running time of the drying unit 20, i.e., the preset time. The preset time represents time from the beginning to end of each running of the drying unit 20. The control unit controls the timing unit to start timing when controlling the drying unit 20 to start to run, and controls the drying unit 20 to stop when the timing length of the timing unit is equal to the preset time, so as to complete a drying operation. The preset time of the timing unit may be preset by the user according to different drying requirements. For example, when the roller brush 32 is a lint roller brush with strong water absorption, relatively long drying time is needed, and the user may set relatively long preset time. When the roller brush 32 is a bristle roller brush with weak water absorption, relatively short drying time is needed, and the user may set relatively short preset time.

[0052] Further, the tray further includes a charging unit. The tray may perform drying treatment on the roller brush 32 on the cleaning device 30 while charging the cleaning device 30 to realize two functions at the same time. Therefore, preparations of the cleaning device 30 may be completed quickly to save time for a next cleaning operation.

[0053] How the tray provided in the embodiment of the present disclosure runs will now be introduced.

[0054] A method for performing drying treatment by use of the tray includes the following steps.

[0055] In step 1, the tray is turned on, or the tray is connected to a power supply to automatically enter a standby state.

[0056] In step 2, the detection unit detects whether the cleaning device 30 is disposed on the tray. If YES, step 3 continues to be performed. If NO, no processing is performed, or the process is ended.

[0057] In step 3, the control unit controls the drying unit 20 to run.

[0058] Further, the method for performing drying treatment by use of the tray may further include the following steps (referring to FIG. 10).

[0059] In step 4, whether the timing length of the timing unit is equal to the preset time is determined. If YES, step 5 is performed. If NO, step 3 continues to be performed.

[0060] In step 5, the control unit turns off the drying unit 20, and the process is ended.

[0061] In summary, according to the technical solution provided in the embodiment of the present disclosure, the tray may be used with the cleaning device 30. When the cleaning device 30 is disposed on the tray, the roller brush 32 on the cleaning device 30 is located in the roller brush groove 11, and the drying unit 20 runs to perform drying

treatment on the roller brush groove 11 and the roller brush 32 in the roller brush groove 11. Therefore, the roller brush 32 is prevented from being stored in a humid environment, breeding of bacteria and production of odors are reduced, the service life of the roller brush 32 is prolonged, and in addition, a strong guarantee is provided for user health.

Embodiment 2

[0062] Based on embodiment 1, the embodiments of the present disclosure disclose embodiment 2. In embodiment 2, the embodiments of the present disclosure provide a cleaning apparatus system, including a cleaning device 30 and a tray. The tray may be implemented by the tray as mentioned in embodiment 1. A specific solution is as follows.

[0063] Referring to FIGs. 1 to 9, the embodiments of the present disclosure also provide a cleaning apparatus system, including a cleaning device 30 and a tray. The cleaning device 30 includes a shell 31 and a roller brush 32 mounted to the shell 31. The tray includes a tray body 10 and a drying unit 20. The tray body 10 is provided with a roller brush accommodation region. The roller brush 32 is located in the roller brush accommodation region when the cleaning device 30 is disposed on the tray. A mounting cavity 12 is provided in the tray body 10. The drying unit 20 is mounted in the mounting cavity 12. The drying unit 20 runs to perform drying treatment on the roller brush accommodation region and the roller brush 32 in the roller brush accommodation region.

[0064] According to the technical solution provided in the embodiment of the present disclosure, the cleaning device 30 may be disposed on the tray, and the tray provides a storage function for the cleaning device 30. When the cleaning device 30 is disposed on the tray, the roller brush 32 on the cleaning device 30 is located in the roller brush accommodation region, and the drying unit 20 runs to perform drying treatment on the roller brush accommodation region and the roller brush 32 in the roller brush accommodation region. Therefore, the roller brush 32 is prevented from being stored in a humid environment, breeding of bacteria and production of odors are reduced, the service life of the roller brush 32 is prolonged, and in addition, a strong guarantee is provided for user health.

[0065] In the embodiment of the present disclosure, there are many implementation modes of the drying unit 20. Referring back to FIG. 4, as an implementation mode of the drying unit 20, the drying unit 20 includes a heating apparatus 21, and a position of the heating apparatus 21 corresponds to that of the roller brush accommodation region. When the cleaning device 30 is disposed on the tray body 10 after completing cleaning, the heating apparatus 21 may be turned on automatically or manually by the user. After being turned on, the heating apparatus 21 may continuously heat the roller brush accommodation region. When the heating apparatus 21 heats the

roller brush accommodation region, water in the roller brush accommodation region and on the roller brush 32 is gradually evaporated by heat, and water vapor is brought out by heat convection, so as to implement drying treatment of the roller brush accommodation region and the roller brush 32. The water vapor generated by heating may be brought out through a gap of the shell 31.

[0066] In the embodiment of the present disclosure, there is another implementation mode of the drying unit 20, besides the foregoing implementation of the drying unit 20 by the heating apparatus 21. Referring to FIGs. 6 and 7, the drying unit 20 includes an air outlet apparatus 23. The air outlet apparatus 23 includes, but not limited to, a fan. An air outlet 13 facing the roller brush accommodation region is formed in the tray body 10. A ventilation channel 14 is provided in the mounting cavity 12. The air outlet apparatus 23 is communicated with the air outlet 13 through the ventilation channel 14. Taking a fan as an example, when the cleaning device 30 is disposed on the tray body 10 after completing cleaning, the fan may be turned on automatically or manually by a user. After being turned on, the fan may push outside air into the mounting cavity 12 of the tray body 10. After entering the ventilation channel, airflow flows forward to the air outlet 13 along the ventilation channel, and then is blown into the roller brush accommodation region from the air outlet 13. Air circulation in the roller brush accommodation region is improved by the airflow generated by the fan, so as to bring the water out through the airflow to implement air-drying treatment of the roller brush accommodation region and the roller brush 32. The airflow entering the roller brush accommodation region may be blown from the gap of the shell 31. The dashed line in FIGs. 6 and 7 indicates a flow path and direction of the airflow.

[0067] Similarly, the roller brush accommodation region may be arranged to be a plane structure, a slope structure, a curved structure, or a combination of one or more of these structures. Further, in order to accommodate the roller brush better, the roller brush accommodation region is arranged to be a roller brush groove 11 shown in FIGs. 1, 2, and 4.

[0068] Further, in the embodiment of the present disclosure, the shell 31 includes a roller brush cover 33, and the roller brush cover 33 is arranged at an outer side of the roller brush 32 in a covering manner. When the cleaning device 30 is disposed on the tray, the roller brush groove 11 and the roller brush cover 33 form an airflow channel for airflow to flow through along an outer lateral surface of the roller brush 32. When the drying unit 20 performs drying treatment, the water may be brought away from the airflow channel.

[0069] In order to make it convenient for the water to leave the roller brush cavity quickly, an air vent 34 is formed in the roller brush cover 33 at a position opposite to the roller brush groove 11. The water vapor may leave the roller brush cavity quickly through the air vent 34. The air vent 34 is formed at a position corresponding to the roller brush groove 11. That is, the air vent 34 is located

above the roller brush groove 11.

[0070] In order to further perform drying treatment on the roller brush 32 on the cleaning device 30, in the embodiment of the present disclosure, drying treatment may be performed on the roller brush 32 through a suction component in the cleaning device 30, to dry the roller brush 32 quickly and prevent the roller brush 32 from getting moldy and smelly. Specifically, a suction component is further arranged in the shell 31. The suction component may include, but not limited to, a main motor and a fan blade.

[0071] The cleaning device 30 is further provided with a suction port in airflow communication with the suction component. The suction port is arranged at a bottom of the shell 31. The suction port is located in the roller brush groove 11 when the roller brush 32 is located in the roller brush groove 11. The suction component runs to perform drying treatment on the roller brush groove 11 and the roller brush in the roller brush groove 11.

[0072] In the embodiment of the present disclosure, the suction component may work in two modes. One is a normal working mode. In the normal working mode, the suction component works with relatively high power to complete a cleaning operation on a surface to be cleaned. The other is a drying working mode. In the drying working mode, the suction component works with relatively low power to complete drying treatment of the roller brush 32.

[0073] When the cleaning device 30 is disposed on the tray body 10 after completing cleaning, the suction port is located in the roller brush 11, and the suction component runs in the drying working mode with relatively low power. For example, the suction component is controlled to run with power of more a dozen watts and even a few watts. Therefore, the suction component may run with a relatively low voltage and current, and a generated noise is low. The suction component drives the airflow to flow to perform air-drying treatment on the roller brush 32, air duct, and other components in a relatively closed environment, thereby avoiding mildews and odors and prolonging the service life of the machine. In addition, the suction component runs with relatively low power, so that electric energy waste and long-term noises are avoided.

[0074] It is to be noted that the foregoing manner of drying the roller brush 32 through the suction component may be implemented independent of or combined with the drying unit 20.

[0075] It is to be noted that the technical features of the tray as mentioned in embodiment 2 may refer to the implementation modes of the tray in embodiment 1, related technical features in embodiment 2 may refer to those in embodiment 1, and elaborations are omitted herein.

Embodiment 3

[0076] Based on embodiment 1 and embodiment 2, the

embodiments of the present disclosure disclose embodiment 3. In embodiment 3, the embodiments of the present disclosure provide a cleaning apparatus system, including a cleaning device 30 and a tray. Implementation modes of the cleaning device 30 and the tray may refer to those of the cleaning device 30 and tray as mentioned in embodiment 1 and embodiment 2. A specific solution is as follows.

[0077] Referring to FIGs. 1 to 9, the embodiments of the present disclosure also provide a cleaning apparatus system, including a cleaning device 30, a tray, and a drying unit. The cleaning device 30 includes a roller brush 32. The tray includes a tray body 10. The tray body 10 includes a roller brush accommodation region and a mounting cavity 12. The drying unit 20 is arranged in the mounting cavity 12. The drying unit 20 runs to perform drying treatment on the roller brush accommodation region and the roller brush 32 in the roller brush accommodation region.

[0078] According to the technical solution provided in the embodiment of the present disclosure, the cleaning device 30 may be disposed on the tray, and the tray provides a storage function for the cleaning device 30. When the cleaning device 30 is disposed on the tray, the roller brush 32 on the cleaning device 30 is located in the roller brush accommodation region, and the drying unit 20 runs to perform drying treatment on the roller brush accommodation region and the roller brush 32 in the roller brush accommodation region. Therefore, the roller brush 32 is prevented from being stored in a humid environment, breeding of bacteria and production of odors are reduced, the service life of the roller brush 32 is prolonged, and in addition, a strong guarantee is provided for user health.

[0079] It is to be noted that the technical features of the cleaning device 30, tray, and drying unit 20 as mentioned in embodiment 3 may refer to the implementation modes of the cleaning device 30, tray, and drying unit 20 in embodiment 1 and embodiment 2, related technical features in embodiment 3 may refer to those in embodiment 1 and embodiment 2, and elaborations are omitted herein.

Embodiment 4

[0080] Based on embodiment 1 to embodiment 3, the embodiments of the present disclosure disclose embodiment 4. In embodiment 4, the embodiments of the present disclosure provide a base station, including a base station body and a drying unit 20. The base station body includes a roller brush accommodation region and a mounting cavity 12. The drying unit 20 is arranged in the mounting cavity 12. The drying unit 20 runs to perform drying treatment on the roller brush accommodation region and a roller brush 32 in the roller brush accommodation region.

[0081] It is to be noted that the technical features of the base station body and drying unit 20 as mentioned in

embodiment 4 may refer to the implementation modes of the base station body and drying unit 20 in embodiment 1 and embodiment 2, related technical features in embodiment 4 may refer to those in embodiment 1 to embodiment 3, and elaborations are omitted herein.

Embodiment 5

[0082] Based on embodiment 1 to embodiment 4, the embodiments of the present disclosure disclose embodiment 5. In embodiment 5, the embodiments of the present disclosure provide a cleaning apparatus system, including a cleaning device 30 and a tray. Implementation modes of the cleaning device 30 and the tray may refer to those of the cleaning device 30 and tray as mentioned in embodiment 1 and embodiment 2. A specific solution is as follows.

[0083] A cleaning apparatus system includes a cleaning device 30 and a tray. The cleaning device 30 includes a roller brush 32. The tray includes a tray body 10. The tray body 10 is provided with a roller brush accommodation region. A mounting cavity 12 is provided in the tray body 10. A drying unit 20 is arranged in the mounting cavity 12. When the cleaning device 30 is located on the tray body 10, the roller brush 32 is located in the roller brush accommodation region, and the drying unit 20 is aligned with the roller brush accommodation region and the roller brush 32. The drying unit 20 runs to perform drying treatment on the roller brush accommodation region and the roller brush 32. It is to be noted that the technical features of the cleaning device 30 and tray as mentioned in embodiment 5 may refer to the implementation modes of the cleaning device 30 and tray in embodiment 1 to embodiment 4, related technical features in embodiment 5 may refer to those in embodiment 1 to embodiment 4, and elaborations are omitted herein.

[0084] The technical solutions used in the present disclosure will now be described in combination with specific application scenarios to assist in understanding. The following application scenarios take a cleaning device as an example.

Application scenario 1

[0085] After the ground is cleaned, the cleaning device may be stored in the tray, through which a storage and charging functions may be provided for the cleaning device. When the cleaning device is disposed on the tray body, the roller brush of the cleaning device is located in the roller brush groove. The drying unit may be turned on manually by a user or automatically to run.

[0086] The drying unit is a heating apparatus. After being turned on, the heating apparatus may continuously heat the roller brush groove. When the heating apparatus heats the roller brush groove, water in the roller brush groove and on the roller brush is gradually evaporated by heat, and water vapor is separated from the roller brush and brought out by heat convection, so as to implement

drying treatment of the roller brush groove and the roller brush. The water vapor generated by heating may be brought out through a gap of the shell.

5 Application scenario 2

[0087] After the ground is cleaned, the cleaning device may be stored in the tray, through which a storage and charging functions may be provided for the cleaning device. When the cleaning device is disposed on the tray body, the roller brush of the cleaning device is located in the roller brush groove. The drying unit may be turned on manually by a user or automatically to run.

[0088] The drying unit is a fan. After being turned on, the fan may push outside air into the mounting cavity of the tray body. After entering the ventilation channel, airflow flows forward to the air outlet along the ventilation channel, and then is blown into the roller brush groove from the air outlet. The air outlet may be formed in front of the roller brush groove, and faces the groove opening of the roller brush groove. Alternatively, the air outlet is located at the groove bottom of the roller brush groove.

[0089] When the cleaning device is disposed on the tray, the roller brush groove and the roller brush cover form an airflow channel for airflow to flow through along an outer lateral surface of the roller brush. The airflow blown out of the air outlet flows through the outer lateral surface of the roller brush along the airflow channel to bring the water away from the roller brush. Air circulation in the roller brush groove is improved by the airflow generated by the fan, so as to bring the water out through the airflow to implement air-drying treatment of the roller brush groove and the roller brush.

35 Application scenario 3

[0090] An air vent is formed in the roller brush cover of the cleaning device.

[0091] In application scenario 1, after the water is turned into water vapor by heating, the water vapor may rise gradually to leave the roller brush cavity quickly through the air vent and be diffused to an external environment quickly.

[0092] In application scenario 2, the airflow generated by the fan flows through the outer lateral surface of the roller brush along the airflow channel, and is blown out of the air vent quickly to bring the water away from the roller brush.

50 Application scenario 4

[0093] When the cleaning device is disposed on the tray body after completing cleaning, the suction port is located in the roller brush. In such case, the suction component may be selected manually or automatically to run in the drying working mode. In this mode, running power of the suction component is relatively low. For example, the suction component is controlled to run with

power of more a dozen watts and even a few watts. Therefore, the suction component may run with a relatively low voltage and current, and a generated noise is low. The suction component drives the airflow to flow to perform air-drying treatment on the roller brush, air duct, and other components in a relatively closed environment.

[0094] It is finally to be noted that: the above embodiments are used not to limit but only to describe the technical solutions of the present disclosure. Although the present disclosure is described with reference to the foregoing embodiments in detail, those of ordinary skill in the art should understand that modifications may also be made to the technical solutions recorded in each of the foregoing embodiments, or equivalent replacements may be made to part of technical features therein. These modifications or replacements do not make the essence of the corresponding technical solutions depart from the spirit and scope of the technical solutions of each embodiment of the present disclosure.

Claims

1. A cleaning apparatus system, comprising: comprising a cleaning device (30) and a tray: wherein the tray comprises:
 - a tray body (10), wherein an outer surface of the tray body (10) is provided with a roller brush accommodation region, and a mounting cavity (12) is provided in the tray body (10); the tray body (10) is provided with an air outlet (13) facing the roller brush accommodation region, the roller brush accommodation region is a roller brush groove (11); and the air outlet (13) is located in front of the roller brush groove (11); and a front portion of the tray is located in front of the roller brush groove (11); and
 - a drying unit (20), mounted in the mounting cavity (12) and running to perform drying treatment on the roller brush accommodation region and a roller brush (32) in the roller brush accommodation region; the drying unit (20) comprises an air outlet apparatus (23) for providing an air flow, after the air outlet apparatus (23) operates, the air flow enters the roller brush groove (11) through the air outlet (13); and the air flow flows upward at the front portion of the tray and then drops off towards the air outlet (13);
 - wherein the cleaning device (30) comprises a shell (31) and a roller brush (32) mounted to the shell (31).
2. The cleaning apparatus system according to claim 1, wherein a position of the roller brush groove (11) where the air outlet (13) is located is higher than a bottom of the roller brush groove (11) in height.
3. The cleaning apparatus system according to claim 1, wherein the air outlet (13) and the air outlet apparatus (23) are located at a front end and a back end of the roller brush groove (11) respectively; a ventilation channel (14) is provided in the mounting cavity (12), and the air outlet apparatus (23) is communicated with the air outlet (13) through the ventilation channel (14); the ventilation channel (14) extends along a bottom of the roller brush groove (11), such that the air flow pushed by the air outlet apparatus (23) flows towards the air outlet (13) through the bottom of the roller brush groove (11), and at the front of the roller brush groove (11), the air flow flows upwards first and then downwards, and flows out from the air outlet (13).
4. The cleaning apparatus system according to claim 1, wherein the shell (31) comprises a roller brush cover (33), and the roller brush cover (33) is arranged at an outer side of the roller brush in a covering manner; when the cleaning device (30) is disposed on the tray, the roller brush cover (33) extends to and being lower than a top surface of the front of the roller brush groove (11).
5. The cleaning apparatus system according to claim 4, wherein the roller brush cover (33) extends to the air outlet (13).
6. The cleaning apparatus system according to claim 1, wherein at the front of the roller brush groove (11), the air flow flows upwards first and then downwards, and flows out from the air outlet (13) in a downward tilting trend.
7. The cleaning apparatus system according to claim 1, wherein at the front of the roller brush groove (11), there is a directional turning point for the air flow where the air flow flows upwards turning flows downwards, and the directional turning point is higher than the air outlet (13) in height.
8. The cleaning apparatus system according to claim 2, wherein the drying unit (20) comprises a heating apparatus (21), and a position of the heating apparatus (21) corresponds to a position of the roller brush accommodation region.
9. The cleaning apparatus system according to claim 8, wherein the groove bottom of the roller brush groove (11) is the lowest point of the roller brush groove (11), and the heating apparatus (21) is located at groove bottom of the roller brush groove (11).
10. The cleaning apparatus system according to any one of claims 1 to 9, further comprising a detection unit and a control unit; wherein,

the control unit is electrically connected with the detection unit and the drying unit (20) respectively; and
the control unit controls the drying unit (20) to run when the detection unit detects a triggering event. 5

11. The cleaning apparatus system according to claim 10, further comprising a timing unit; wherein, 10

the timing unit is electrically connected with the control unit, and the control unit controls the timing unit to run while controlling the drying unit (20) to run; and
the control unit controls the drying unit (20) to be turned off when a timing length of the timing unit is equal to preset time. 15

12. The cleaning apparatus system according to claim 1, wherein a suction component is further arranged in the shell (31); 20

a suction port of the suction component is arranged at a bottom of the shell (31); the suction port is located in the roller brush groove (11) when the roller brush (32) is located in the roller brush groove (11); 25
and the suction component runs to perform drying treatment on the roller brush groove (11) and the roller brush (32) in the roller brush groove (11).

13. The cleaning apparatus system according to claim 12, wherein the suction component works with a first power to complete a cleaning operation on a surface to be cleaned, and the suction component works with a second power to complete drying treatment of the roller brush; and wherein the first power is larger than the second power. 30
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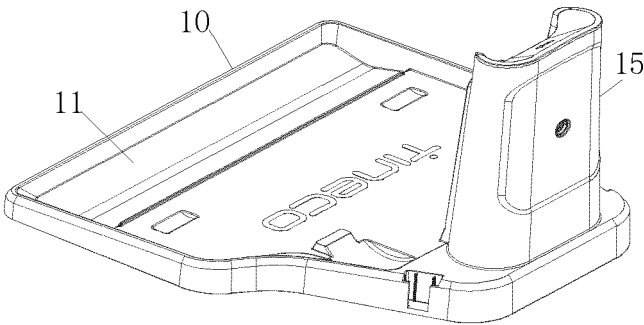


FIG. 1

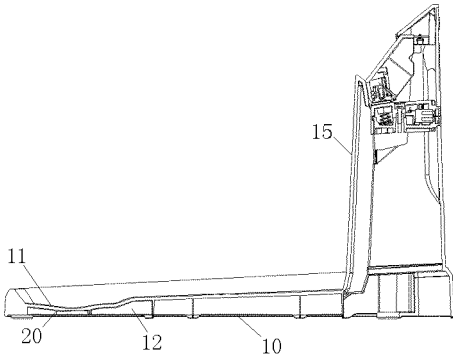


FIG. 2

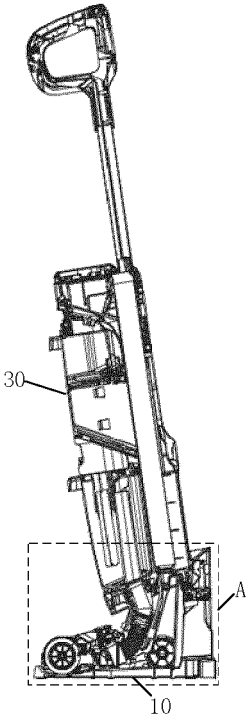


FIG. 3

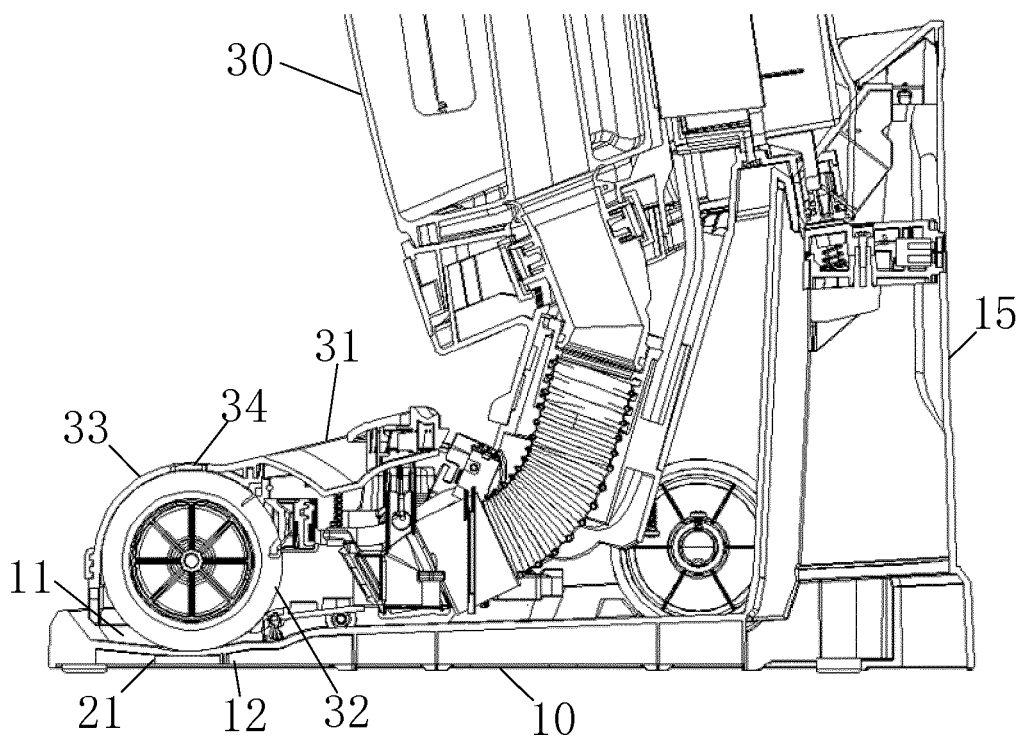


FIG. 4

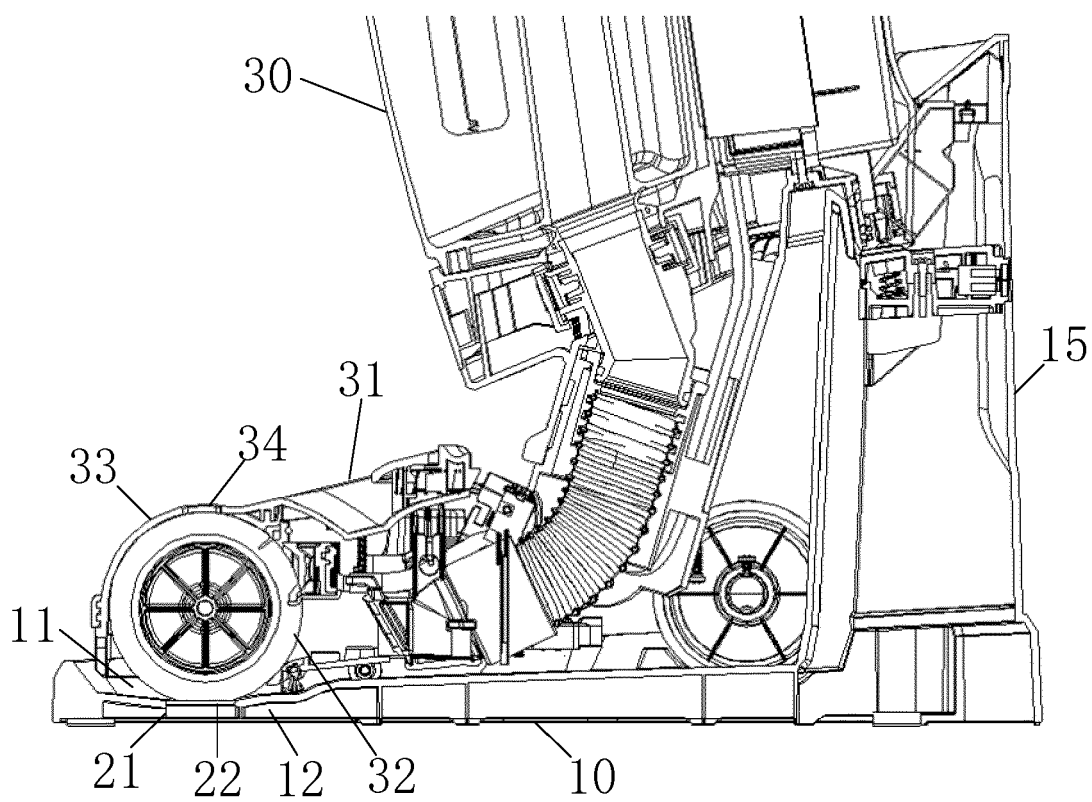


FIG. 5

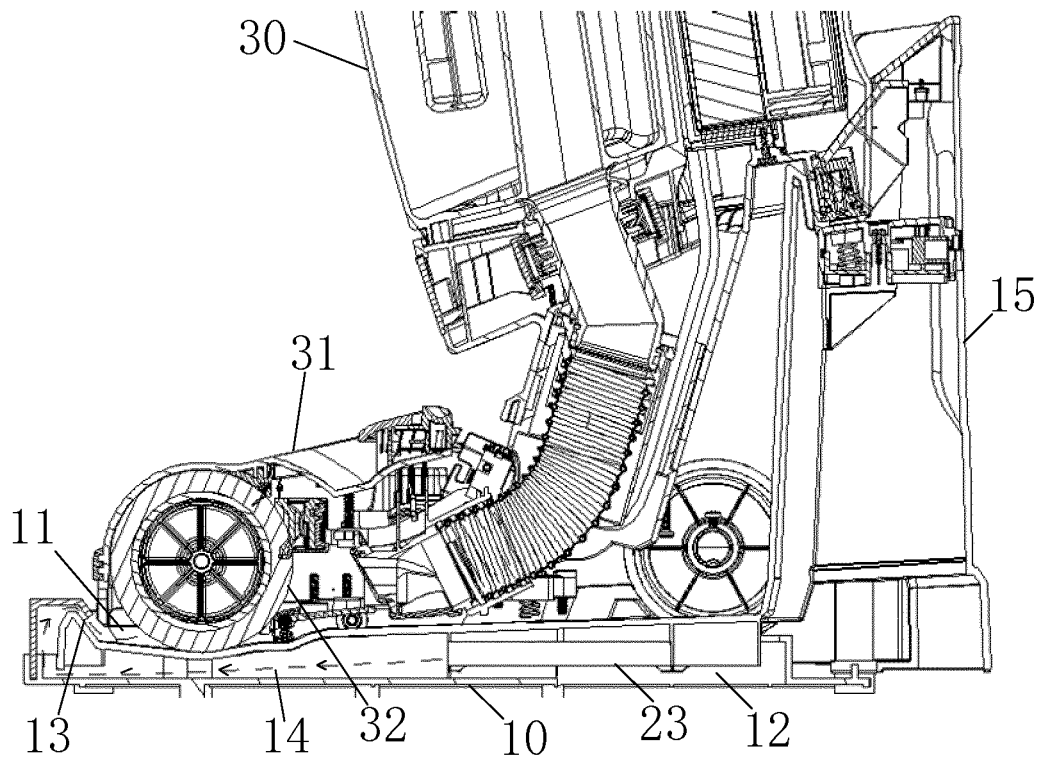


FIG. 6

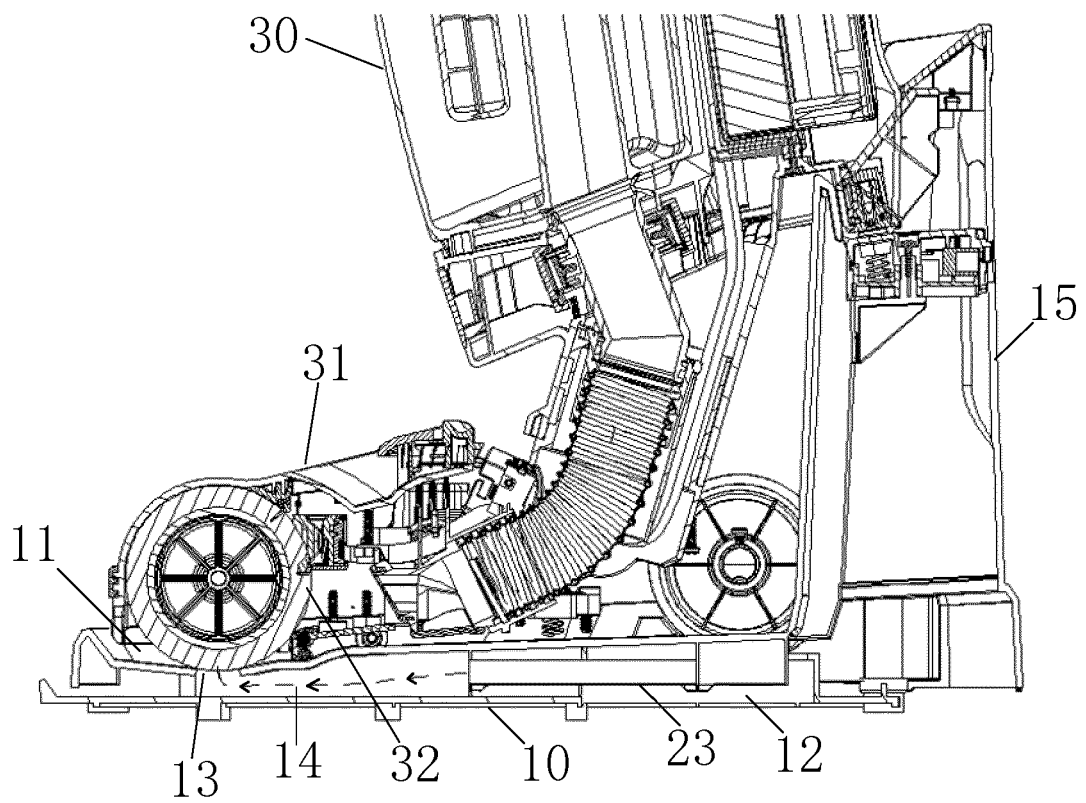


FIG. 7

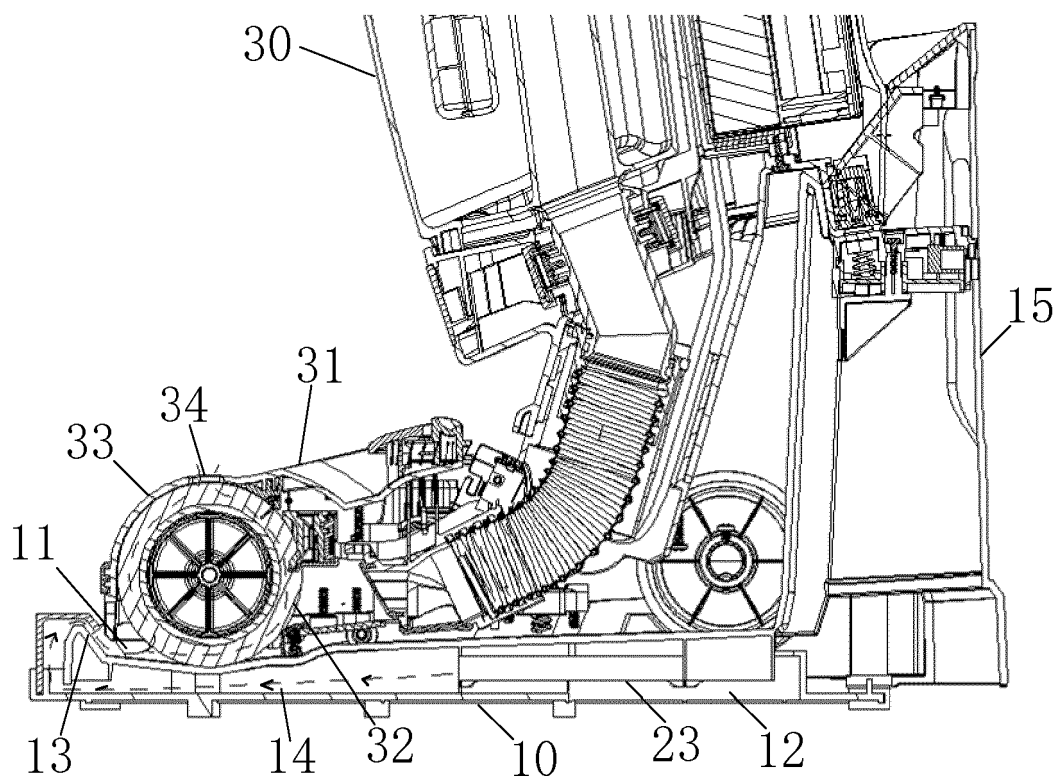


FIG. 8

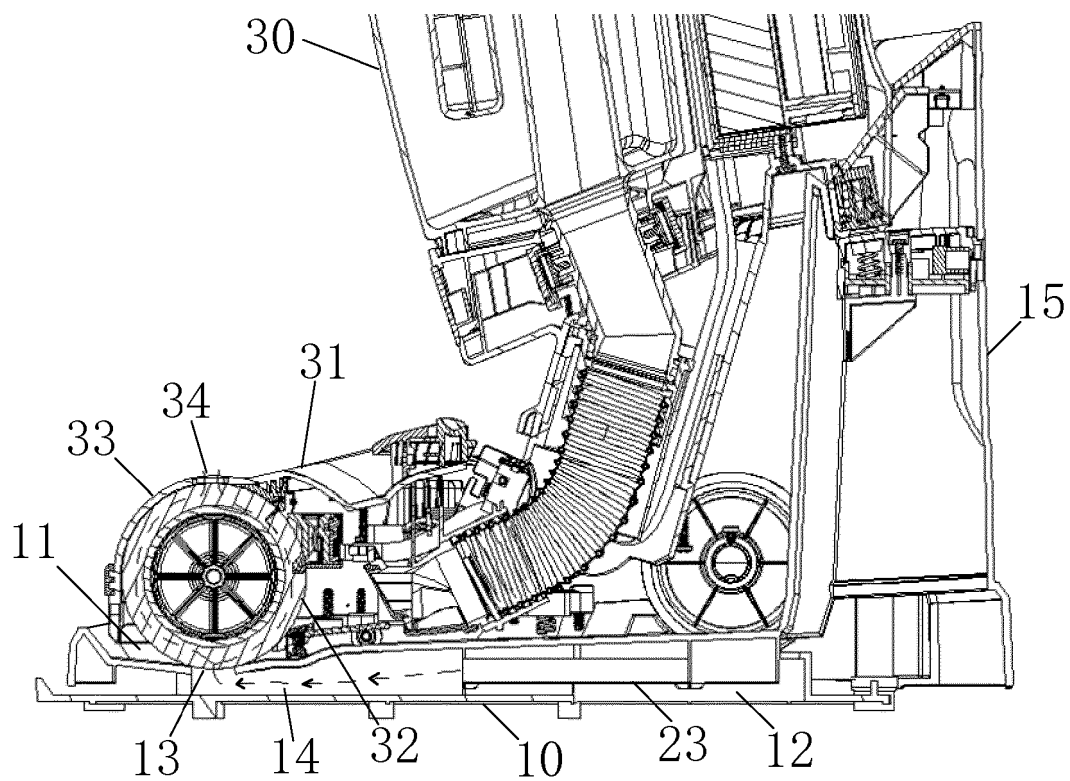


FIG. 9

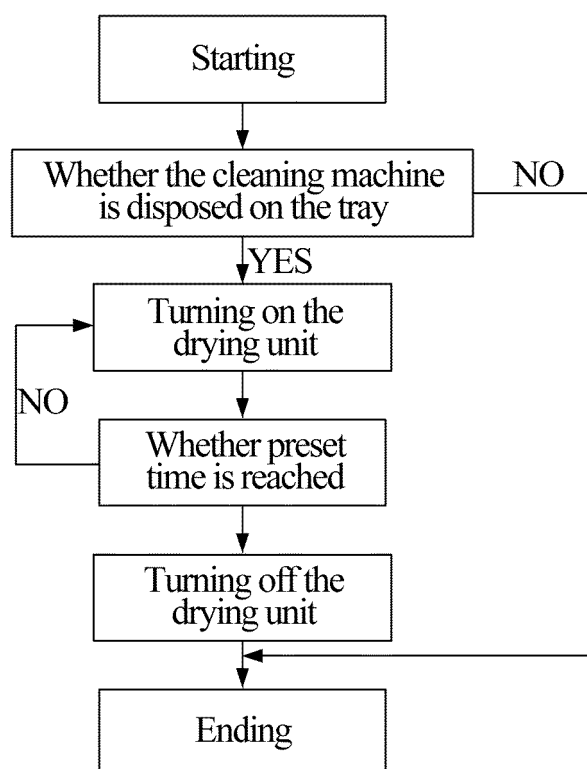


FIG. 10

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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