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(54) **PILE BODY AND CLEANING SYSTEM**

(57) A pile body (10) and a cleaning system. The pile body (10) is configured to support a cleaning apparatus (20), and comprises a base (11). The base (11) is provided with an accommodating recess (111) and an air outlet (112), wherein the accommodating recess (111) comprises a first accommodating portion (1111) and a second accommodating portion (1112), which are arranged side by side. The first accommodating portion

(1111) and the second accommodating portion (1112) are configured to respectively accommodate a first cleaning roller (2111) and a second cleaning roller (2112) of the cleaning apparatus (20). The air outlet (112) is arranged between the first accommodating portion (1111) and the second accommodating portion (1112), and is configured to output an airflow in order to dry the first cleaning roller (2111) and the second cleaning roller (2112).

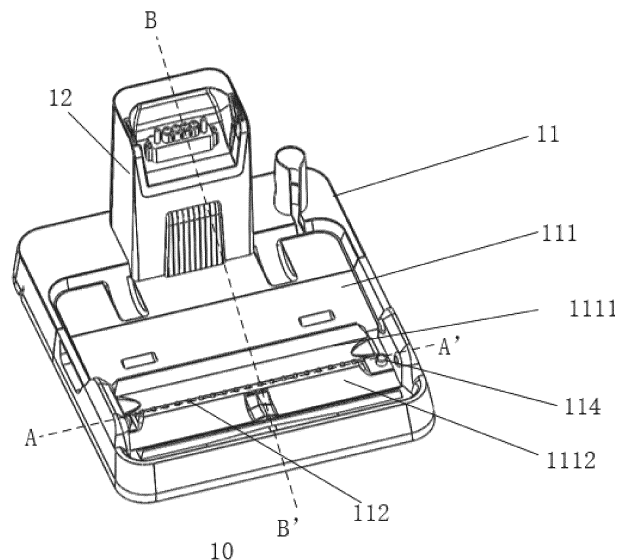


FIG. 1

Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application claims priority to the Chinese Patent Application No. 202211041336.3, filed on August 29, 2022, which is incorporated herein by reference in its entirety as a part of the present application.

TECHNICAL FIELD

[0002] The present disclosure relates to the field of automatic cleaning technologies, and in particular to a station and a cleaning system.

BACKGROUND OF THE INVENTION

[0003] With the continuous development of science and technology, cleaning devices (e.g., floor scrubbers) have been widely used by families, since more time and labor can be saved by using the floor scrubbers than traditional manual cleaning. The floor scrubber usually includes a floor scrubber body and a cleaning seat. A recovery water tank (e.g., a sewage tank), a cleaning fluid tank (e.g., a clean water tank) and a main fan for suction are provided inside the floor scrubber body. The cleaning seat includes a cleaning roller for mopping. A cleaning fluid (e.g., water) is sprayed onto the cleaning roller by means of a built-in water pipe. The cleaning roller rotates at a high speed to mop and wash a floor. The floor scrubber usually needs to be used with a matched station, which can support dock of the floor scrubber for performing some maintenance, such as charging, self-cleaning and drying.

SUMMARY OF THE INVENTION

[0004] According to some embodiments of the present disclosure, there is provided a station, configured to support a cleaning device, where the station includes a base, and the base is provided with an accommodating groove and at least one air outlet;

the accommodating groove includes a first accommodating portion and a second accommodating portion provided side by side, the first accommodating portion and the second accommodating portion being configured to accommodate a first cleaning roller and a second cleaning roller of the cleaning device respectively; and
the at least one air outlet is provided between the first accommodating portion and the second accommodating portion, and is configured to output airflow to dry the first cleaning roller and the second cleaning roller.

[0005] In some embodiments, the at least one air outlet

is configured to be able to switch between an open state and a closed state.

[0006] In some embodiments, the base is provided with a switch member, and the switch member is configured to switch between a first position and a second position;

the at least one air outlet is in the open state when the switch member is located in the first position; and
the at least one air outlet is in the closed state when the switch member is located in the second position.

[0007] In some embodiments,

the switch member is located in the first position to release the at least one air outlet when the station supports the cleaning device; and
the switch member is located in the second position to block the at least one air outlet when the station is disengaged from the cleaning device.

[0008] In some embodiments, a first end portion of the switch member extends out from the at least one air outlet when the switch member is located in the second position.

[0009] In some embodiments, the station further includes:

a switchover member, configured to switch between a third position and a fourth position, the switchover member being linked with the switch member;
the switch member being located in the first position when the switchover member is located in the third position; and
the switch member being located in the second position when the switchover member is located in the fourth position.

[0010] In some embodiments, when the station supports the cleaning device, the switchover member is located in the third position to cause the switch member to be located in the first position so as to release the at least one air outlet; and

when the station is disengaged from the cleaning device, the switchover member is located in the fourth position to cause the switch member to be located in the second position so as to block the at least one air outlet.

[0011] In some embodiments, a first end portion of the switchover member extends out from a top surface of the base when the switchover member is located in the fourth position, and the first end portion of the switchover member is configured to receive an external force to cause the switchover member to switch from the fourth position to the third position.

[0012] In some embodiments, the station further includes:

a reset member, configured to cause the switchover member to have a tendency of switching to the fourth

position.

[0013] In some embodiments, the at least one air outlet is farther away from a bottom surface of the base than a bottom of the first accommodating portion and/or a bottom of the second accommodating portion.

[0014] In some embodiments, there are a plurality of air outlets, and the plurality of air outlets are arranged in one or more columns.

[0015] In some embodiments, the at least one air outlet is substantially parallel to a bottom surface of the base.

[0016] In some embodiments, the base is further provided with:

a first auxiliary air outlet, provided on a side of the first accommodating portion away from the at least one air outlet, and configured to output airflow to dry the first cleaning roller; and/or

a second auxiliary air outlet, provided on a side of the second accommodating portion away from the at least one air outlet, and configured to output airflow to dry the second cleaning roller.

[0017] In some embodiments, the station further includes:

a fan, provided inside a housing of the station and configured to form airflow.

[0018] In some embodiments, the station further includes:

a first heating apparatus, provided inside a housing of the station and configured to heat airflow.

[0019] According to some embodiments of the present disclosure, there is provided a station, configured to support a cleaning device, the station including a base, the base being provided with:

an accommodating groove, configured to accommodate a cleaning roller of the cleaning device; and at least one air outlet, configured to output airflow to dry the cleaning roller; wherein the at least one air outlet is configured to be able to switch between an open state and a closed state.

[0020] In some embodiments, the station further includes:

a switch member, provided inside a housing of the base, and configured to switch between a first position and a second position; wherein the at least one air outlet is released to be in the open state when the switch member is located in the first position; and the at least one air outlet is blocked to be in the closed state when the switch member is located in the second position.

[0021] In some embodiments, a first end portion of the switch member extends out from the at least one air outlet

when the switch member is located in the second position.

[0022] In some embodiments, the station further includes:

a switchover member, configured to switch between a third position and a fourth position, the switchover member being linked with the switch member; the switch member being located in the first position when the switchover member is located in the third position; and the switch member being located in the second position when the switchover member is located in the fourth position.

[0023] In some embodiments, when the station supports the cleaning device, the switchover member is located in the third position to cause the switch member to be located in the first position so as to release the at least one air outlet; and

when the station is disengaged from the cleaning device, the switchover member is located in the fourth position to cause the switch member to be located in the second position so as to block the at least one air outlet.

[0024] In some embodiments, a first end portion of the switchover member extends out from a top surface of the base when the switchover member is located in the fourth position, and the first end portion of the switchover member is configured to receive an external force to cause the switchover member to switch from the fourth position to the third position.

[0025] In some embodiments, the station further includes:

a reset member, configured to cause the switchover member to have a tendency of switching to the fourth position.

[0026] In some embodiments, the station further includes:

a control apparatus, configured to send, after the at least one air outlet is in the open state, a control signal to the cleaning device to cause the cleaning device to perform self-cleaning.

[0027] In some embodiments, the station further includes:

a charging interface, configured for providing electric energy to the cleaning device; the control apparatus being configured to control the charging interface to be in a power-off state within a predetermined time after the at least one air outlet is in the open state.

[0028] In some embodiments, the station further includes:

a water exchange interface, configured for exchange of a cleaning fluid and/or sewage with the cleaning device;

the control apparatus being configured to control the water exchange interface to be in a closed state within a predetermined time after the at least one air outlet is in the open state.

[0029] In some embodiments, the station further includes:

a fan, provided inside a housing of the station and configured to form airflow.

[0030] In some embodiments, the station further includes:

a first heating apparatus, provided inside a housing of the station and configured to heat airflow.

[0031] In some embodiments, there are a plurality of air outlets, and the plurality of air outlets are arranged in one or more columns in a first direction.

[0032] According to some embodiments of the present disclosure, there is provided a station, configured to support a cleaning device, where the station includes a base, and the base is provided with:

an accommodating groove, configured to accommodate a cleaning roller of the cleaning device; and
at least one air outlet, configured to output airflow to dry the cleaning roller;
the at least one air outlet being farther away from a bottom of the base than a bottom of the accommodating groove.

[0033] In some embodiments, the at least one air outlet is configured to be able to switch between an open state and a closed state.

[0034] In some embodiments, the base is provided with a switch member configured to switch between a first position and a second position;

the at least one air outlet is in the open state when the switch member is located in the first position; and
the at least one air outlet is in the closed state when the switch member is located in the second position.

[0035] In some embodiments, the switch member is located in the first position to release the at least one air outlet when the station supports the cleaning device; and the switch member is located in the second position to block the at least one air outlet when the station is disengaged from the cleaning device.

[0036] In some embodiments, a first end portion of the switch member extends out from the at least one air outlet when the switch member is located in the second position.

[0037] In some embodiments, the station further includes:

a switchover member, configured to switch between a third position and a fourth position, wherein at least a part of the switchover member is located inside a housing of the base, and the switchover member is

linked with the switch member;

the switch member is located in the first position when the switchover member is located in the third position; and

the switch member is located in the second position when the switchover member is located in the fourth position.

[0038] In some embodiments, when the station supports the cleaning device, the switchover member is located in the third position to cause the switch member to be located in the first position; and

when the station is disengaged from the cleaning device, the switchover member is located in the fourth position to cause the switch member to be located in the second position.

[0039] In some embodiments, a first end portion of the switchover member extends out from a top surface of the base when the switchover member is located in the fourth position, and the first end portion of the switchover member is configured to receive an external force to cause the switchover member to switch from the fourth position to the third position.

[0040] In some embodiments, when the cleaning device returns to the station, the cleaning device presses the first end portion of the switchover member under the action of its own weight to cause the switchover member to switch from the fourth position to the third position.

[0041] In some embodiments, the station further includes:

a reset member, configured to cause the switchover member to have a tendency of switching to the fourth position.

[0042] In some embodiments, there are a plurality of air outlets, and the plurality of air outlets are arranged in one or more columns in a first direction.

[0043] In some embodiments, the station further includes:

a fan, provided inside a housing of the station and configured to form airflow.

[0044] In some embodiments, the station further includes:

a first heating apparatus, provided inside a housing of the station and configured to heat airflow.

[0045] According to some embodiments of the present disclosure, there is provided a cleaning system. The cleaning system includes a cleaning device and the station as described in the foregoing embodiments.

BRIEF DESCRIPTION OF DRAWINGS

[0046] The accompanying drawings herein, which are incorporated into the Description and constitute a part of the Description, show embodiments conforming to the present disclosure, and are used to explain the principles of the present disclosure together with the Description. Apparently, the accompanying drawings in the following description show merely some embodiments of the pre-

sent disclosure, and those of ordinary skill in the art can also derive other accompanying drawings from these accompanying drawings without creative efforts. In the accompanying drawings:

FIG. 1 is a schematic structural diagram of a station according to some embodiments of the present disclosure;

FIG. 2 is a schematic structural diagram of a cleaning system according to some embodiments of the present disclosure, in which a cleaning device is supported by a station;

FIG. 3 is a schematic structural diagram of the cleaning system according to some embodiments of the present disclosure, in which the cleaning device is disengaged from the station;

FIG. 4 is a schematic structural diagram of the station according to some embodiments of the present disclosure, showing a section of the station in FIG. 1 along A-A', in which an air outlet is in an open state;

FIG. 5 is a schematic structural diagram of the station according to some embodiments of the present disclosure, showing the section of the station in FIG. 1 along A-A', in which the air outlet is in a closed state;

FIG. 6 is a schematic structural diagram of a section of the station in FIG. 1 along B-B'; and

FIG. 7 is a schematic structural diagram of the section of the station in FIG. 1 along B-B', and is a three-dimensional schematic structural diagram.

DETAILED DESCRIPTION

[0047] To make the objectives, technical solutions and advantages of the present disclosure clearer, the present disclosure will be further described in detail below with reference to the accompanying drawings. Apparently, the described embodiments are only some, but not all of the embodiments of the present disclosure. All other embodiments acquired by those of ordinary skills in the art without creative efforts based on the embodiments in the present disclosure are within the protection scope of the present disclosure.

[0048] It should also be noted that, the terms "including", "containing", or any other variants thereof are intended to cover the nonexclusive inclusion, such that a commodity or apparatus including a series of elements includes not only those elements, but also other elements not listed explicitly or elements inherent to such a commodity or apparatus. Without more limitations, the element defined by the phrase "including a ..." does not exclude the existence of other same elements in the commodity or apparatus including the element.

[0049] In the field, a cleaning device (e.g., a floor scrubber) usually includes a device body and a cleaning seat. The cleaning device is usually provided with a recovery water tank (e.g., a sewage tank), a cleaning fluid tank (e.g., a clean water tank), and a main fan for suction. The cleaning seat includes a cleaning roller for

mopping, and there may be 1, 2 or more cleaning rollers. A cleaning fluid (e.g., water) is distributed by means of a built-in water pipe to the cleaning roller with fluff and/or to a surface to be cleaned. The cleaning roller rotates at a high speed to mop the surface to be cleaned, and at the same time, a negative pressure is formed in a device air duct of the cleaning device by the main fan, such that sewage (which may include solid waste) on the surface to be cleaned is sucked in from a sewage suction port of the cleaning device and pumped into the sewage tank. The sewage recovery path described above forms a part of the device air duct of the cleaning device. The cleaning device is usually returned to the station after use, and the cleaning device is supported by the station, on which the device can be automatically cleaned, the cleaning roller can be cleaned and dried, and charging operations can be performed.

[0050] Optional embodiments of the present disclosure will be described in detail below with reference to the accompanying drawings.

[0051] FIG. 1 is a schematic structural diagram of a station according to some embodiments of the present disclosure. As shown in FIG. 1, according to some embodiments of the present disclosure, there is provided a station 10 configured to support a cleaning device. The station 10 includes a base 11, and the base 11 is provided with an accommodating groove 111 and an air outlet 112. The accommodating groove 111 is configured to accommodate a cleaning roller of the cleaning device, such that self-cleaning can be performed on the cleaning roller of the cleaning device in the accommodating groove. The air outlet 112 is configured to output airflow to dry the cleaning roller of the cleaning device. The airflow may be room-temperature airflow or heated airflow. The cleaning roller of the cleaning device, after finishing self-cleaning, needs to be dried, for example, air-dried, thus the heated airflow is more conducive to air-drying the cleaning roller.

[0052] As shown in FIG. 1, the accommodating groove 111 includes a first accommodating portion 1111 and a second accommodating portion 1112 provided side by side; the first accommodating portion 1111 and the second accommodating portion 1112 are configured to accommodate a first cleaning roller and a second cleaning roller of the cleaning device respectively; and, the air outlet 112 is provided between the first accommodating portion and the second accommodating portion, and is configured to output airflow to dry the first cleaning roller and the second cleaning roller. Providing the air outlet at this position can realize simultaneous air-drying of the cleaning rollers of the cleaning device that are provided side by side, which is simple in structure and improves the air-drying efficiency.

[0053] In some embodiments, the station 10 further includes a supporting seat 12. The supporting seat 12 is provided on the base 11 and configured to support a device body of the cleaning device. The supporting seat 12 and the base 11 may be of separated structures, and may also be integrally formed. When the cleaning device

is supported by the station, at least one of the base 11 or the supporting seat 12 plays a supporting role.

[0054] FIG. 2 is a schematic structural diagram of a cleaning system according to some embodiments of the present disclosure, in which the cleaning device is supported by the station. FIG. 3 is a schematic structural diagram of the cleaning system according to some embodiments of the present disclosure, in which the cleaning device is disengaged from the station.

[0055] According to some embodiments of the present disclosure, there is further provided a cleaning device 20, for example, a floor scrubber, that matches the station 10. As shown in FIG. 2 and FIG. 3, the cleaning device 20 includes a cleaning seat 21, a device body 22 and a handle assembly 23. The device body 22 is provided above the cleaning seat 21, and is movably connected, e.g., pivotally connected, to the cleaning seat 21. The handle assembly 23 is connected to an end of the device body 22 away from the cleaning seat 21 for a user to hold and operate. The user holds the handle assembly 23, so as to manipulate the cleaning seat 21 to perform a cleaning task on a surface to be cleaned, for example, a floor.

[0056] In some embodiments, the device body 22 extends longitudinally, the handle assembly 23 is connected to an upper end of the device body 22, the cleaning seat 21 is connected to a lower end of the device body 22, and the device body 22 is pivotally connected to the cleaning seat 21, such that the handle assembly 23 and the device body 22 may rotate relative to the cleaning seat 21, so as to change an operation angle and flexibly adjust a cleaning posture. The cleaning seat 21 includes a cleaning component, e.g., a cleaning roller 211, located at the bottom of the cleaning seat 21. Specifically, there may be 1 or more, for example, two or three, cleaning rollers 211, and the cleaning rollers 211 may rotate at a high speed to mop the floor. As shown in FIG. 5 and FIG. 7, the cleaning roller 211 includes a first cleaning roller 2111 and a second cleaning roller 2112, and the first cleaning roller 2111 and the second cleaning roller 2112 are provided side by side. Each of the first cleaning roller 2111 and the second cleaning roller 2112 may be composed of two roller brush units or at least three roller brush units.

[0057] In some embodiments, as shown in FIG. 1 and FIG. 2, the cleaning device 20, e.g., a floor scrubber, further includes a clean water tank 26 and a sewage tank 25, both of which are for example provided on the device body 22. The clean water tank 26 contains a cleaning fluid (e.g., clean water), and can provide clean water to the cleaning roller 211 by means of a clean water pipeline, for wetting a surface of the cleaning roller 211, thus causing the cleaning roller 211 to perform wet cleaning on the surface to be cleaned. The sewage tank 25 is configured to accommodate recovered sewage. When the cleaning roller 211 performs wet cleaning, sewage may be generated on the cleaned surface and recovered into the sewage tank 25 by means of a sewage recovery pipeline.

[0058] In some embodiments, as shown in FIG. 1 and FIG. 2, after completing the cleaning operation, the cleaning device 20 is usually placed on the station 10, and the cleaning device 20 is supported and fixed by the station 10. The supporting seat 12 of the station 10 may support the device body 22 of the cleaning device 20, and the base 11 of the station 10 may support the cleaning seat 21 of the cleaning device 20.

[0059] Referring to FIG. 1 to FIG. 3, in some embodiments, an end portion of the supporting seat 12 away from the base 11 is provided with a supporting groove 121. The supporting groove 121 is configured to accommodate at least a part of the device body 22 of the cleaning device 20 to support the device body 22, for example, is configured to accommodate an end portion of the device body 22 away from the handle assembly 23. When the cleaning device 20 is placed on the station 10 after completing the cleaning operation, the supporting groove 121 supports the device body 22, and the accommodating groove 111 on the base 11 accommodates and supports the cleaning seat 21 of the cleaning device 20. The first cleaning roller 2111 and the second cleaning roller 2112 on the cleaning seat 21 are accommodated in the first accommodating portion 1111 and the second accommodating portion 1112 of the accommodating groove 111 respectively.

[0060] In some embodiments, the air outlet 112 is configured to be able to switch between an open state and a closed state. When it is needed to output airflow from the air outlet 112, for example, in a working mode of drying, the air outlet 112 is in the open state; and when it is needed to prevent a foreign matter, such as dust and a liquid, from entering the air outlet 112, specifically in a scenario such as that the cleaning device 20 is not placed on the station 10 or the cleaning device 20 is placed on the station 10 to be in a self-cleaning working mode, the air outlet 112 is in the closed state.

[0061] In some embodiments, the air outlet 112 is in the open state when the station 10 supports the cleaning device 20. After self-cleaning of the cleaning roller 211 of the cleaning device 20 is completed, the air outlet 112 may output airflow to dry the cleaning roller 211, so as to prevent the cleaning roller 211 from breeding mold. The air outlet 112 is in the closed state when the cleaning device 20 is disengaged from the station 10, such that dust and other foreign matters can be prevented from entering the station 10 through the air outlet to ensure the cleanliness inside the station 10.

[0062] In some embodiments, the air outlet 112 may also be in the open state when the cleaning device 20 supported on the station 10 is in the self-cleaning working mode, and the airflow output by the air outlet 112 can prevent the cleaning fluid, e.g., water, for washing the cleaning roller when the cleaning device 20 is in the self-cleaning working mode, from entering the station 10 through the air outlet 112.

[0063] In some embodiments, the air outlet 112 may also be in the closed state when the cleaning device 20

supported on the station 10 is in the self-cleaning working mode, so as to prevent the cleaning fluid, e.g., water, for washing the cleaning roller 211, from entering the station 10 through the air outlet 112.

[0064] FIG. 4 is a schematic structural diagram of the station according to some embodiments of the present disclosure, showing a section of the station in FIG. 1 along A-A', in which the air outlet is in the open state. FIG. 5 is a schematic structural diagram of the station according to some embodiments of the present disclosure, showing the section of the station in FIG. 1 along A-A', in which the air outlet is in the closed state.

[0065] With reference to FIG. 1 to FIG. 5, a switch member 113 is provided inside a housing of the base 11 and configured to switch between a first position and a second position. When the station 10 supports the cleaning device 20, the switch member 113 is located in the first position to release the air outlet 112, such that the air outlet 112 is in the open state. When the station 10 is disengaged from the cleaning device 20, the switch member 113 is located in the second position to block the air outlet 112, such that the air outlet 112 is in the closed state.

[0066] As shown in FIG. 4 and FIG. 5, the switch member 113 is for example a pin post, which may for example move in a direction perpendicular to a plane where the base is located, and switch between the first position and the second position. As shown in FIG. 4, when the switch member 113 is located in the first position, it is wholly located inside a housing of the base 10, and at this time, there is a certain distance between an end portion of the switch member 113 close to the air outlet 112 and the air outlet 112. The air outlet 112 is in the open state, such that the airflow may be output from the station 10 through the air outlet 112. As shown in FIG. 5, when the switch member 113 is located in the second position, the switch member 113 blocks the air outlet 112, and for example, at least a part of the switch member 113 is inserted into the air outlet 112. The air outlet 112 is in the closed state, such that the airflow in the station 10 is prevented from being output. It should be noted that the name of the pin post is not a limitation to its shape, and the shape and the size of the pin post need to match the shape and the size of the air outlet 112. For example, when the air outlet is circular, the pin post may be cylindrical, conical or shaped like the frustum of a cone, and its diameter is basically related to an internal diameter of the air outlet 112, such that the air outlet may be basically completely closed when the pin post is inserted into the air outlet 112.

[0067] In some embodiments, a first end portion of the switch member 113 extends out from the air outlet 112 when the switch member 113 is located in the second position. With this design, in the process of switching the air outlet 112 from the open state to the closed state, dust and debris attached to an inner wall of the air outlet 112 or dust and debris near the air outlet 112 can be pushed away by the switch member 113, so as to realize cleaning

of the air outlet.

[0068] In some embodiments, the switch member 113 may be of a door-type shielding switch structure; for example, at least one door panel may be adopted, and the door panel may be opened in any way that can realize closing and releasing of the air outlet. For example, for one door panel, it may be opened and closed from one side; and for two door panels, they may be opened opposite to each other. The movement mode of the door-type shielding switch structure to switch between the first position in which the air outlet 112 is released and the second position in which the air outlet 112 is blocked, may be a sliding mode, a rotating mode or a combination of them.

[0069] The station 10 further includes a switching control unit for controlling position switching of the switch member, such that the switch member may switch between the first position and the second position, which in turn causes the air outlet to be able to switch between the open state and the closed state. The switching control unit may be of a mechanical structure, an electronic circuit structure or a combination of them. When the electronic circuit structure is adopted, a sensor may be used with a conventional electromagnetic driver, a motor or the like to control position switching of the switch member, which will not be repeated herein. The present disclosure hereinafter mainly takes the mechanical structure as an example to introduce the switching control unit.

[0070] In some embodiments, as shown in FIG. 1 to FIG. 5, the switching control unit of the station 10 is of a mechanical structure, and specifically, includes a switch-over member 114,. The switchover member 114 is configured to switch between a third position and a fourth position, at least a part of the switchover member 114 is located inside a housing of the base 11, and there is a linkage relationship between the switchover member 114 and the switch member 113. In some embodiments, the switchover member 114 and the switch member 113 are of an integrally formed structure. When the station 10 supports the cleaning device 20, the switchover member 114 is located in the third position, such that the switch member 113 is located in the first position; and when the station 10 is disengaged from the cleaning device 20, the switchover member 114 is located in the fourth position, such that the switch member 113 is located in the second position.

[0071] As shown in FIG. 4 and FIG. 5, the switch member 114 is, for example, a switching post. For example, the switch member 114 is of a structure integrally formed with the switch member 113. For example, the switchover member 114 is movable in a direction perpendicular to a plane where the base is located, and the movement of the switchover member 114 drives the switch member 113 to move. It should be noted that the name of the switching post is not a limitation to its shape, and the switching post may be in a conventional shape of a cylinder, a square column, a cone, a frustum of a cone or the like.

[0072] In some embodiments, when the switchover member 114 is located in the fourth position, a first end portion of the switchover member 114 extends out from a top surface of the base 11, and the first end portion is configured to receive an external force to cause the switchover member 114 to switch from the fourth position to the third position. FIG. 5 illustrates a state in which the switchover member 114 is located in the fourth position. In the process of returning the cleaning device 20 to the station 10, a part of the cleaning seat 21 of the cleaning device 20 presses the first end portion of the switchover member 114 extending out from the top surface of the base 11. Under the action of the gravity of the cleaning seat 21 of the cleaning device 20, the switchover member 114 gradually moves toward the third position. FIG. 4 illustrates a state in which the switchover member 114 is located in the third position. That is, the switching operation of the switchover member 114 can be completed by relying on the weight of the cleaning device 20, such that the switch member 113 can switch from the second position to the first position, which in turn realizes an opening operation of the air outlet.

[0073] In some embodiments, as shown in FIG. 4 and FIG. 5, the station further includes a reset member 1141, and the reset member 1141 abuts against the switchover member 114, such that the switchover member 114 has a tendency of switching to the fourth position. The reset member 1141 may be an elastic member, such as a spring, a torsion spring or an elastic sheet. The reset member 1141 is, for example, provided between the switchover member 114 and an inner surface of a bottom wall of the base 11. When the cleaning device 20 is removed or lifted from the station 10, the external force on the first end portion of the switchover member 114 from the cleaning seat 21 disappears, and the switchover member 114 switches from the third position to the fourth position under a restoring force of the reset member 1141, such that the switch member 113 switches from the first position to the second position, which in turn realizes a closing operation of the air outlet 112.

[0074] A switching control solution of realizing releasing and closing of the air outlet by using the mechanical structure can be implemented by a simple linkage structure, which is low in manufacturing cost and convenient to disassemble, assemble and maintain.

[0075] In some embodiments, FIG. 6 is a schematic structural diagram of a section of the station in FIG. 1 along B-B'. As shown in FIG. 1 to FIG. 6, the air outlet 112 is farther away from a bottom surface of the base than a bottom of the first accommodating portion 1111 and/or a bottom of the second accommodating portion 1112. That is, as shown in FIG. 6, a distance d1 between the air outlet 112 and the bottom surface of the base is greater than a distance d2 between the bottom of the first accommodating portion 1111 and/or the bottom of the second accommodating portion 1112 and the bottom surface of the base. The first accommodating portion 1111 and the second accommodating portion 1112 are, for example,

adjacent arc-shaped grooves, adjacent side walls of which are spliced to form a raised part. The raised part is located between the first accommodating portion 1111 and the second accommodating portion 1112, and the air outlet 112 is, for example, provided on the raised part. In this way, during the self-cleaning process of the cleaning roller 221 of the cleaning device 20, the cleaning fluid accumulated in the first accommodating portion and the second accommodating portion can be prevented from entering the station 10 through the air outlet 112.

[0076] In some embodiments, as shown in FIG. 1 to FIG. 6, there may be a plurality of air outlets 112, and the plurality of air outlets 112 are arranged in one or more columns, which can be flexibly selected according to the distance between the first cleaning roller 2111 and the second cleaning roller 2112 of the cleaning device 20.

[0077] In some embodiments, as shown in FIG. 1 to FIG. 6, the air outlet 112 is, for example, substantially parallel to the bottom surface of the base; that is, a direction of airflow delivered by the air outlet 112 is, for example, a direction perpendicular to the bottom surface of the base, such as a vertical direction. The direction of the airflow delivered by the air outlet 112 is, for example, tangent to a direction of rotation of the first cleaning roller 2111 and the second cleaning roller 2112, allowing the first cleaning roller 2111 and the second cleaning roller 2112 to be dried simultaneously. The number of columns of the air outlets 112 or the width of the individual air outlet 112 can be increased when the distance between the first cleaning roller 2111 and the second cleaning roller 2112 is relatively greater.

[0078] In some embodiments, the airflow output from the air outlet 112 faces toward a sewage suction port of a sewage suction channel located between the first cleaning roller 2111 and the second cleaning roller 2112, and thus may enter the sewage suction channel of the cleaning device 20 (i.e., the part of the device air duct through which the airflow carrying sewage passes when the cleaning device 20 performs cleaning) from the sewage suction port, so as to perform a drying operation on at least a part of the sewage suction channel. The size of the part of the sewage suction channel on which the drying operation is performed is correlated with the magnitude of the airflow output from the air outlet, i.e., is correlated with the magnitude of operating power of the fan that generates the airflow, and the correlation is usually positive.

[0079] FIG. 7 is a schematic structural diagram of the section of the station in FIG. 1 along B-B', and is a three-dimensional schematic structural diagram.

[0080] In some embodiments, the base 20 is further provided with a first auxiliary air outlet, and the first auxiliary air outlet is provided on a side of the first accommodating portion 1111 away from the air outlet 112 and configured to output airflow to dry the first cleaning roller 2111. The first auxiliary air outlet is, for example, provided on a first side wall of the first accommodating portion 1111 away from the air outlet 112, for example, at a position E in

FIG. 7.

[0081] In some embodiments, the base 20 is further provided with a second auxiliary air outlet, and the second auxiliary air outlet is provided on a side of the second accommodating portion 1112 away from the air outlet 112 and configured to output airflow to dry the second cleaning roller 2112. The first auxiliary air outlet is for example arranged on a second side wall of the second accommodating portion 1112 away from the air outlet 112, for example, at a position F in FIG. 7.

[0082] The air drying speed of the first cleaning roller 2111 and/or the second cleaning roller 2112 can be increased by providing the first auxiliary air outlet and/or the second auxiliary air outlet. Similar to the air outlet 112, the first auxiliary air outlet and/or the second auxiliary air outlet may also be provided with a corresponding switch member structure to switch between an open state and a closed state.

[0083] The first auxiliary air outlet and/or the second auxiliary air outlet may be similar to the air outlet 112, that is, there may be a plurality of first auxiliary air outlets and a plurality of second auxiliary air outlets, which may also be arranged in one or more columns in a first direction and provided parallel to the columns formed by the air outlets 112.

[0084] In some embodiments, at least one of the first auxiliary air outlet and the second auxiliary air outlet is farther away from the bottom surface of the base than the bottom of the first accommodating portion 1111 and/or the bottom of the second accommodating portion 1112. In this way, it is possible to reduce the probability that the cleaning fluid enters the station 10 through the first auxiliary air outlet and/or the second auxiliary air outlet during the self-cleaning process of the cleaning roller 221 of the cleaning device 20.

[0085] In some embodiments, the first auxiliary air outlet is provided on a first side wall of the first accommodating portion away from the air outlet 112. An output direction of the airflow delivered by the first auxiliary air outlet is, for example, perpendicular to a bottom surface where the base is located, or deviated by a certain angle toward an output direction of the airflow output by the air outlet 112. In some embodiments, the output direction of the airflow delivered by the first auxiliary air outlet may be, for example, perpendicular to the first cleaning roller in the first accommodating portion, such that the airflow delivered by the first auxiliary air outlet is blown to the first cleaning roller in a concentrated manner to accelerate the drying of the first cleaning roller.

[0086] In some embodiments, the second auxiliary air outlet is provided on a second side wall of the second accommodating portion 1112 away from the air outlet. An output direction of the airflow delivered by the second auxiliary air outlet is, for example, perpendicular to a bottom surface where the base is located, or deviated by a certain angle toward an output direction of the airflow output by the air outlet 112. In some embodiments, the output direction of the airflow delivered by the second

auxiliary air outlet may be, for example, perpendicular to the second cleaning roller in the second accommodating portion, such that the airflow delivered by the second auxiliary air outlet is blown to the second cleaning roller in a concentrated manner to accelerate the drying of the second cleaning roller.

[0087] In some embodiments, according to the position of the sewage suction port of the cleaning device, at least one of the air outlet, the first auxiliary air outlet or the second auxiliary air outlet may be selected to be provided toward the sewage suction port, such that the drying operation can be performed on at least a part of the sewage suction channel while the drying operation is performed on the cleaning roller, thus further reducing the parts inside the cleaning device where bacteria may germinate and odor may be produced.

[0088] As shown in FIG. 1 to FIG. 7, the station further includes a fan, which is provided inside a housing of the station and configured to form airflow. In some embodiments, the fan is, for example, provided inside the housing at the supporting seat 12, for example, at a position C in FIG. 7. In some embodiments, the fan may also be provided inside a housing of the base 11, for example, at a position G in FIG. 7.

[0089] In some embodiments, the station 10 may include a first heating apparatus provided inside the housing of the station and configured to heat the airflow. In this way, the airflow output from the air outlet 112 is, for example, heated airflow, which is conducive to accelerating the drying of the cleaning roller of the cleaning device 20. In some embodiments, the first heating apparatus may be provided in an air path between the fan and the air outlet 112, for example, at a position D in FIG. 7. In some embodiments, the first heating apparatus may also be provided inside the housing of the base 11, for example, at a position G in FIG. 7. For example, the first heating apparatus may also be provided directly below the accommodating groove 111 to reduce heat loss in the path along which the heated airflow is output to the cleaning roller, thus improving the drying efficiency of the cleaning roller.

[0090] In some embodiments, the station 10 may be provided with a second heating apparatus, which is for example provided in the first accommodating portion 1111 and/or the second accommodating portion 1112. The second heating apparatus may be in direct contact with the cleaning roller 211 to directly dry the cleaning roller 211, so as to prevent the cleaning roller from breeding mold. The second heating apparatus is, for example, a PTC heater, which is of a flat plate structure or an arc structure. When the PTC heater is of the arc structure, it has a larger area of contact with the cleaning roller, which is conducive to drying of the cleaning roller.

[0091] In some embodiments, the station 10 further includes a control apparatus configured to control the station or to control the station and the cleaning device to realize various functions related to the station, including, in some embodiments, controlling a function of commu-

nication with the cleaning device so as to trigger or control the cleaning device to be in a corresponding operating or working mode. In some embodiments, the switching control unit may form at least a part of the control apparatus.

[0092] In some embodiments, the control apparatus of the station sends a control signal to the cleaning device to cause the cleaning device to perform self-cleaning after the air outlet is in the open state.

[0093] In some embodiments, no matter if the air outlet is in the open state or the closed state, the position of the switchover member and/or the position of the switch member may be detected by using a sensor. For example, when the switchover member is switched to the fourth position, or the switch member is switched to the second position, the sensor sends a signal to the control apparatus to confirm that at least one of the switchover member and the switch member is switched in place; otherwise, when the switchover member is switched to the third position, or the switch member is switched to the first position, the sensor sends a signal to the control apparatus to confirm that at least one of the switchover member and the switch member is switched to reset. When the switchover member is implemented by using a mechanical structure, for example, by using a switching post, a travel switch may be set according to the working principle of the switching post to achieve the function of detecting whether the switching post is switched in place. The sensor may also be one or a combination of a Hall sensor, a photoelectric sensor, an electromagnetic sensor, a pressure sensor, a contact switch, a relay and other devices capable of achieving the function of the sensor. Of course, the sensor is not limited to the types listed above as long as the sensor can achieve the desired detection function. By detecting the position of at least one of the switchover member or the switch member, the states of the station and the device represented by which may be used as trigger conditions for subsequently executing various working modes. Exemplary implementing solutions are given below in a non-exhaustive manner.

[0094] In some embodiments, the station may determine, by providing an in-place sensor, whether the cleaning device is in place or not, i.e., whether the cleaning device has been correctly returned to the station. Obviously, the above-mentioned sensor for detecting the position of at least one of the switchover member or the switch member may be associated with whether the cleaning device is placed on the station, and hence may serve as the in-place sensor.

[0095] In some embodiments, the station may detect, by providing a vibration sensor, whether the self-cleaning working mode of the cleaning device is over. When the vibration sensor can monitor vibration, it indicates that the cleaning device is in the self-cleaning working mode; and when the vibration sensor monitors no vibration within a predetermined time, it indicates that the self-cleaning working mode of the cleaning device is over.

After it is detected that the self-cleaning working mode of the cleaning device is over, the control apparatus may start the fan and/or the heating apparatus to perform the drying operation. In other embodiments, the station may also communicate with the cleaning device, and an end signal may be sent to the station after the self-cleaning working mode of the cleaning device is over. Upon reception of the end signal, the control apparatus of the station may start the fan and/or the heating apparatus to perform the drying operation on the cleaning roller of the cleaning device.

[0096] In some embodiments, in the process of drying the cleaning roller of the cleaning device by the station, the control apparatus controls the drying operation to be stopped when it is detected that the cleaning device is disengaged from the station.

[0097] In some embodiments, when the station performs the drying operation on the cleaning roller of the cleaning device, the cleaning roller of the cleaning device may perform intermittent rotation, continuous rotation or a combination of them, thus the cleaning roller may be uniformly dried and/or heated, and the drying speeds and drying effects of various parts of the surface of the cleaning roller are similar. Specifically, the combination of intermittent rotation and continuous rotation is that different rotation modes are adopted in different periods of time in the whole process of drying, such as intermittent rotation-continuous rotation, continuous rotation-intermittent rotation-continuous rotation, continuous rotation-intermittent rotation, intermittent rotation-continuous rotation-intermittent rotation, or the repeat of the above four basic modes. Generally, the intermittent rotation is suitable for the case where the humidity of the cleaning roller is relatively higher, while the continuous rotation is suitable for the case where the humidity of the cleaning roller is relatively lower. In addition, the continuous rotation can achieve a spinning-drying effect by reaching a certain speed. Therefore, by using intermittent rotation-continuous rotation, continuous rotation-intermittent rotation-continuous rotation, and their respective repeat modes in conventional applications, the drying process can be optimized, and the drying efficiency can be improved. For the intermittent rotation, the rotation angle of each rotation is $n\theta$, where n is a natural number and $\theta \in [0-360^\circ]$. For the continuous rotation, the speed of rotation may be lower than that at which the cleaning operation and the self-cleaning are performed, for example, may be 200 r/min or less, specifically such as 30 r/min, 50 r/min, 60 r/min, 90 r/min, 100 r/min or 120 r/min. The cleaning roller may rotate forward, reversely, or forward and reversely alternately to improve the drying effect and fluff up bristles.

[0098] In some embodiments, the station may further include a charging interface configured to provide electrical energy to the cleaning device. The station determines, by means of the in-place sensor, whether the cleaning device is in place, and the cleaning device recognizes the station as a dry charging station through

a special voltage (for example, 20 V) generated by a power board of the station. After the station recognizes that the cleaning device is in place, the control apparatus may convert the output voltage to a normal charging voltage (for example, 25.2 V) after a predetermined delay time, and the cleaning device enters normal charging after detecting the voltage conversion. By the above method, incorrect charging in the case of not docking in place, model mismatch or the like can be avoided, so as to achieve the effect of safe charging.

[0099] In some embodiments, the control apparatus is configured to control the charging interface to be in a power-off state within a predetermined time after the air outlet is in the open state. In this way, when the cleaning device is not returned to the station or the cleaning device is not returned to the station correctly, the charging interface on the station is in the power-off state to play a role of electrical protection.

[0100] In some embodiments, the station further includes a water exchange interface configured for exchange of a cleaning fluid and/or sewage with the cleaning device, i.e., to convey a cleaning fluid to the cleaning device and to suck sewage from the cleaning device. The control apparatus is configured to control the water exchange interface to be in a closed state within a predetermined time after the air outlet is in the open state. In this way, when the cleaning device is not returned to the station or the cleaning device is not returned to the station correctly, the water exchange interface on the station is in the closed state to avoid liquid leakage.

[0101] The above solutions of the embodiments of the present disclosure have at least the following beneficial effects.

[0102] The air outlet is provided between the first accommodating portion and the second accommodating portion, such that the air outlet may be used for simultaneously performing air-drying operation on the cleaning rollers on both sides. Moreover, since the air outlet corresponds to the sewage suction port of the cleaning device, the air-drying operation may also be performed on the sewage suction channel of the cleaning device. Therefore, the structure is simple, and the air-drying efficiency is improved.

[0103] The air outlet may be switched between the open state and the closed state, depending on whether the switch member blocks the air outlet or not. The air outlet is in the closed state when the station is disengaged from the cleaning device, which can prevent dirt from entering the air duct of the station.

[0104] Due to its own weight, the cleaning device, when placed on the station, presses the switchover member to switch from the fourth position to the third position, so as to drive the switch member to switch from the second position to the first position, thus the air outlet is switched from the closed state to the open state. When the cleaning device is disengaged from the station, the switchover member is restored to the fourth position, so as to drive the switch member to restore to the second

position, thus the air outlet is switched to the closed state. The method of unlocking by passively pressing downwards under the action of weight is adopted, thus achieving a simple structure and a low cost.

[0105] In some embodiments, according to some embodiments of the present disclosure, there is further provided a cleaning system. The cleaning system includes the station as described in the foregoing embodiments and a cleaning device.

[0106] Finally, it should be noted that various embodiments in the Description are described in a progressive manner, each embodiment focuses on the differences from other embodiments, and the same or similar parts among the various embodiments may refer to one another. Since the system or apparatus disclosed in the embodiments corresponds to the method disclosed in the embodiments, its description is relatively simple, and for the relevant parts, a reference may be made to the descriptions of the method embodiments.

[0107] The above embodiments are only used for illustrating the technical solutions of the present disclosure and are not intended to limit the present disclosure. Although the present disclosure has been described in detail with reference to the foregoing embodiments, those of ordinary skills in the art should understand that, they can still make modifications to the technical solutions described in the foregoing embodiments or make equivalent substitutions to part of the technical features; and these modifications or substitutions do not make the essence of the corresponding technical solutions deviate from the spirit and scope of the technical solutions of the various embodiments of the present disclosure.

Claims

1. A station, configured to support a cleaning device, wherein the station comprises a base, and the base is provided with an accommodating groove and at least one air outlet;

the accommodating groove comprises a first accommodating portion and a second accommodating portion provided side by side, wherein the first accommodating portion and the second accommodating portion are configured to accommodate a first cleaning roller and a second cleaning roller of the cleaning device respectively; and

the at least one air outlet is provided between the first accommodating portion and the second accommodating portion, and is configured to output airflow to dry the first cleaning roller and the second cleaning roller.

2. The station according to claim 1, wherein the at least one air outlet is configured to be able to switch between an open state and a closed state.

3. The station according to claim 2, wherein the base is provided with a switch member configured to switch between a first position and a second position;
- the at least one air outlet is in the open state when the switch member is located in the first position; and
the at least one air outlet is in the closed state when the switch member is located in the second position.
4. The station according to claim 3, wherein,
- the switch member is located in the first position to release the at least one air outlet when the station supports the cleaning device; and
the switch member is located in the second position to block the at least one air outlet when the station is disengaged from the cleaning device.
5. The station according to claim 4, wherein, a first end portion of the switch member extends out from the at least one air outlet when the switch member is located in the second position.
6. The station according to claim 3, further comprising:
- a switchover member, configured to switch between a third position and a fourth position, wherein the switchover member is linked with the switch member;
wherein, the switch member is located in the first position when the switchover member is located in the third position; and
the switch member is located in the second position when the switchover member is located in the fourth position.
7. The station according to claim 6, wherein,
- when the station supports the cleaning device, the switchover member is located in the third position to cause the switch member to be located in the first position so as to release the at least one air outlet; and
when the station is disengaged from the cleaning device, the switchover member is located in the fourth position to cause the switch member to be located in the second position so as to block the at least one air outlet.
8. The station according to claim 6, wherein, a first end portion of the switchover member extends out from a top surface of the base when the switchover member is located in the fourth position, and the first end portion of the switchover member is configured to receive an external force to cause the switchover member to switch from the fourth position to the third position.
9. The station according to claim 6, further comprising: a reset member, configured to cause the switchover member to have a tendency of switching to the fourth position.
10. The station according to any one of claims 1 to 9, wherein, the at least one air outlet is farther away from a bottom surface of the base than a bottom of the first accommodating portion and/or a bottom of the second accommodating portion.
11. The station according to any one of claims 1 to 9, wherein, there are a plurality of air outlets, and the plurality of air outlets are arranged in one or more columns.
12. The station according to any one of claims 1 to 9, wherein the at least one air outlet is substantially parallel to a bottom surface of the base.
13. The station according to any one of claims 1 to 9, wherein the base is further provided with:
- a first auxiliary air outlet, provided on a side of the first accommodating portion away from the at least one air outlet, and configured to output airflow to dry the first cleaning roller; and/or
a second auxiliary air outlet, provided on a side of the second accommodating portion away from the at least one air outlet, and configured to output airflow to dry the second cleaning roller.
14. The station according to any one of claims 1 to 9, further comprising:
a fan, provided inside a housing of the station and configured to form airflow.
15. The station according to any one of claims 1 to 9, further comprising:
a first heating apparatus, provided inside a housing of the station and configured to heat airflow.

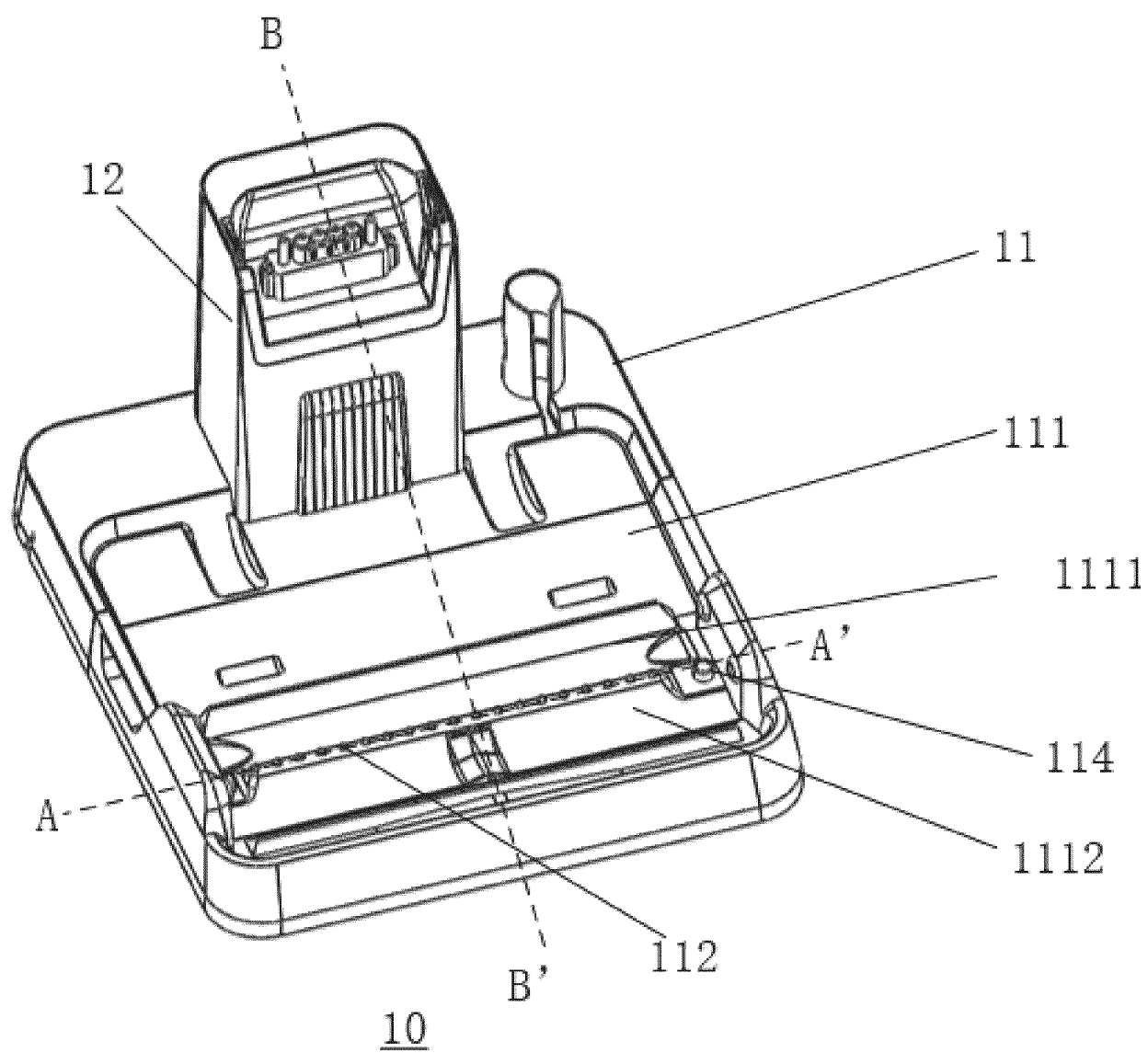


FIG. 1

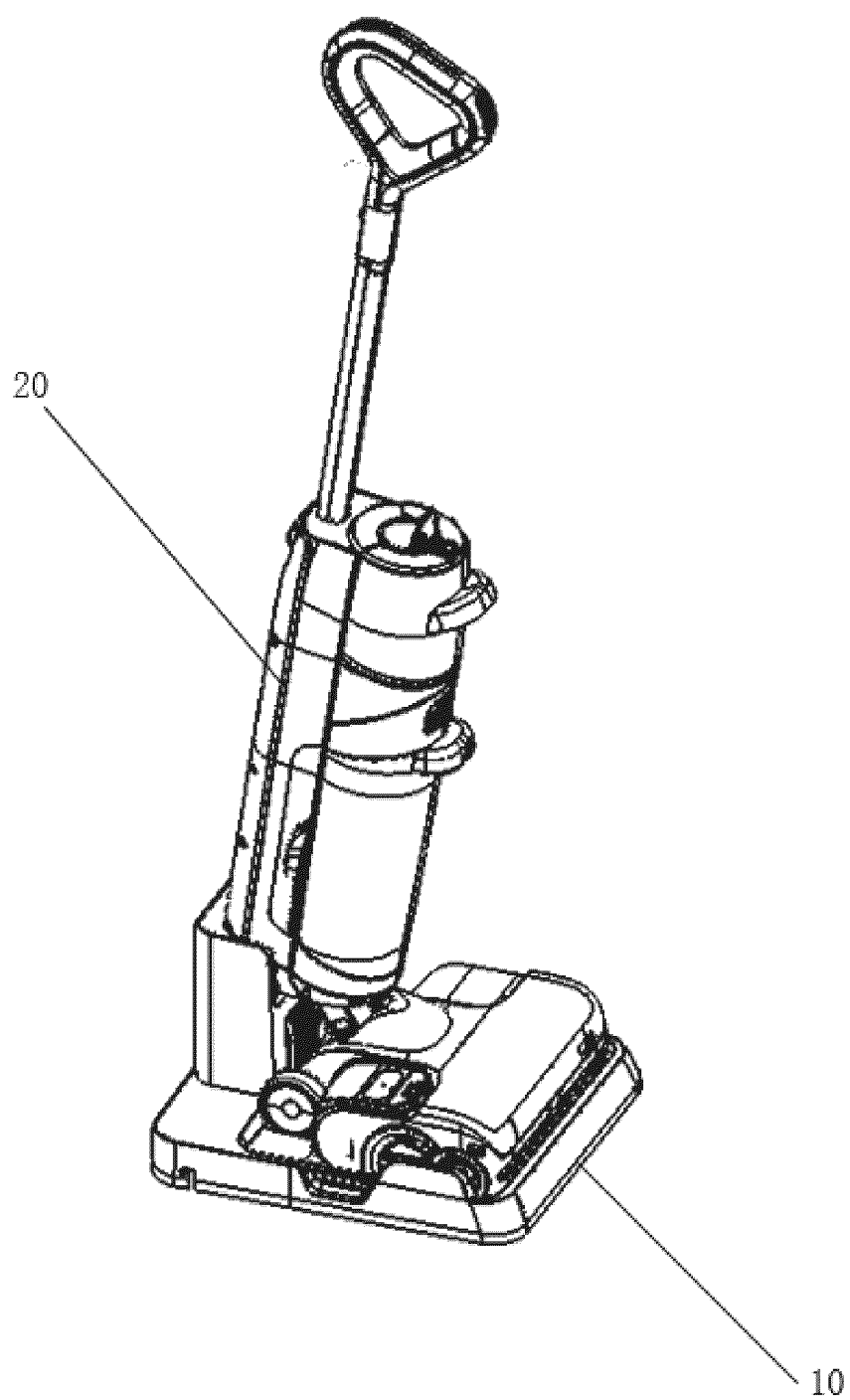


FIG. 2

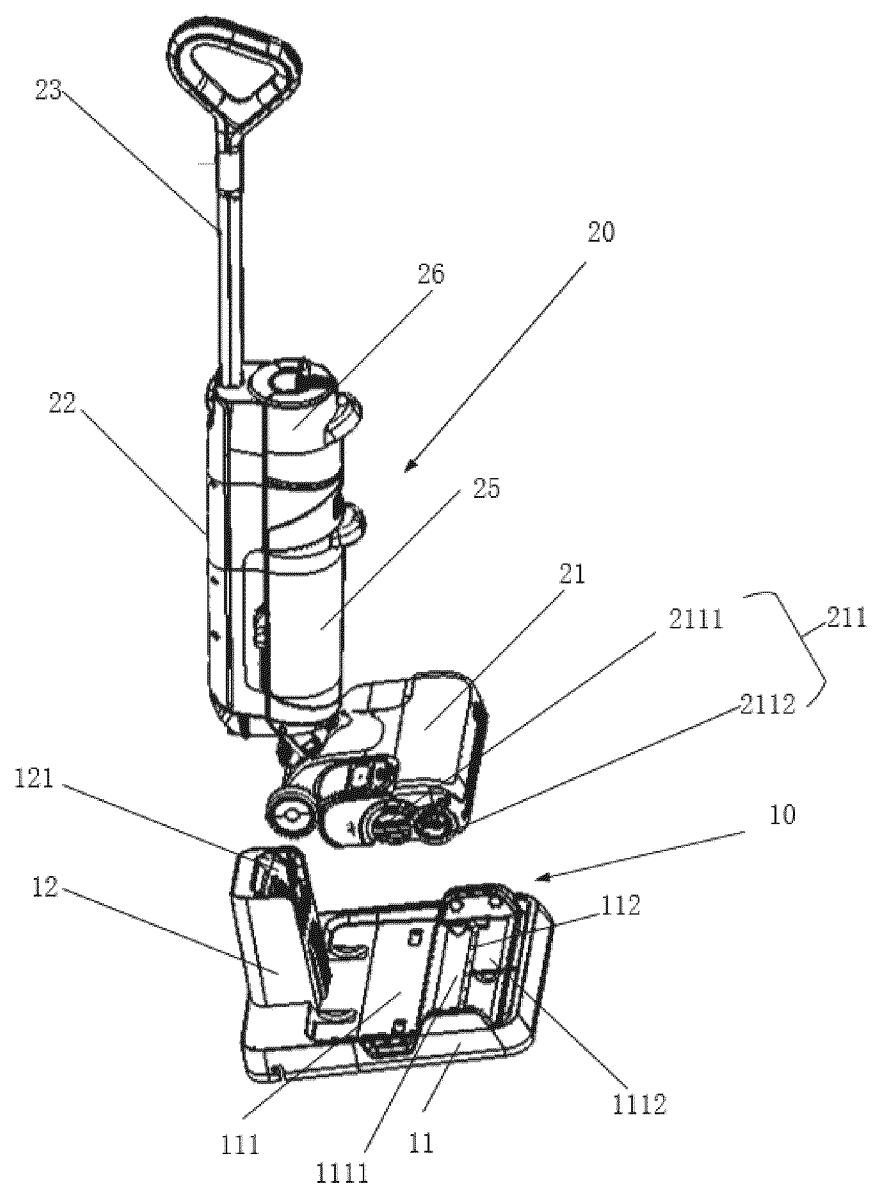


FIG. 3

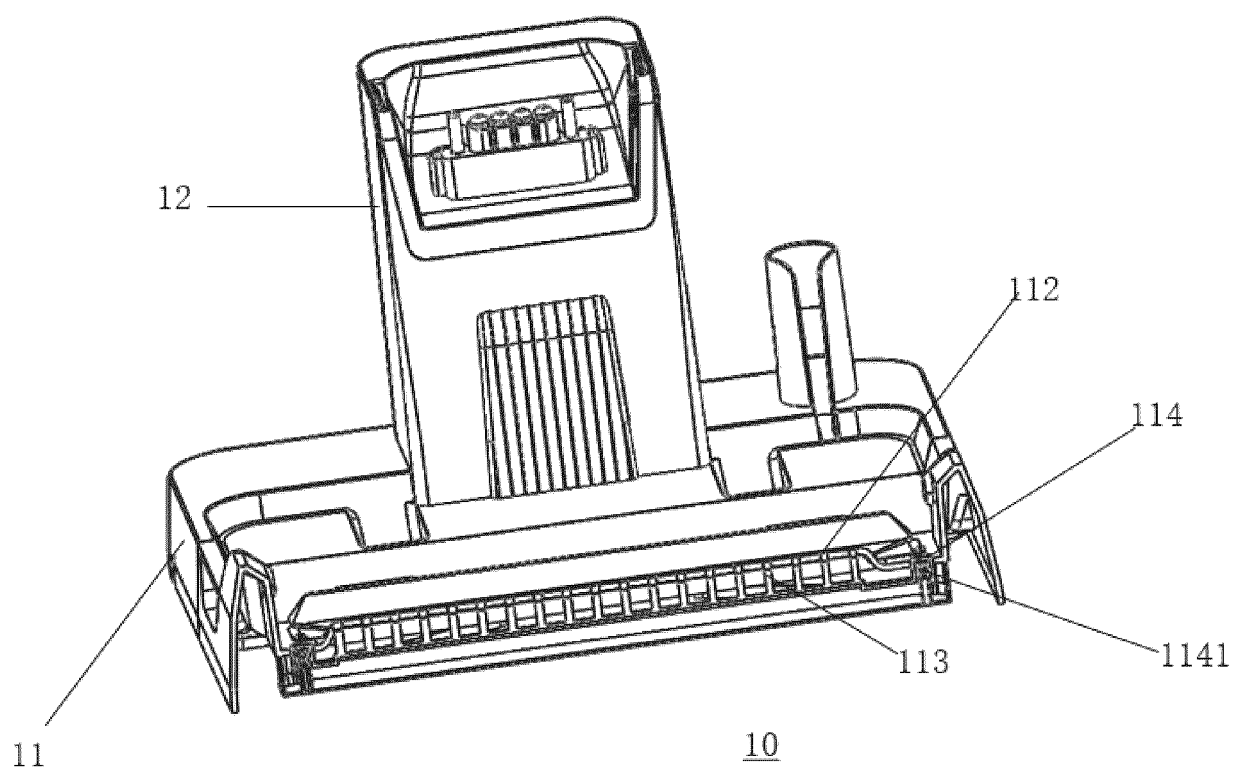


FIG. 4

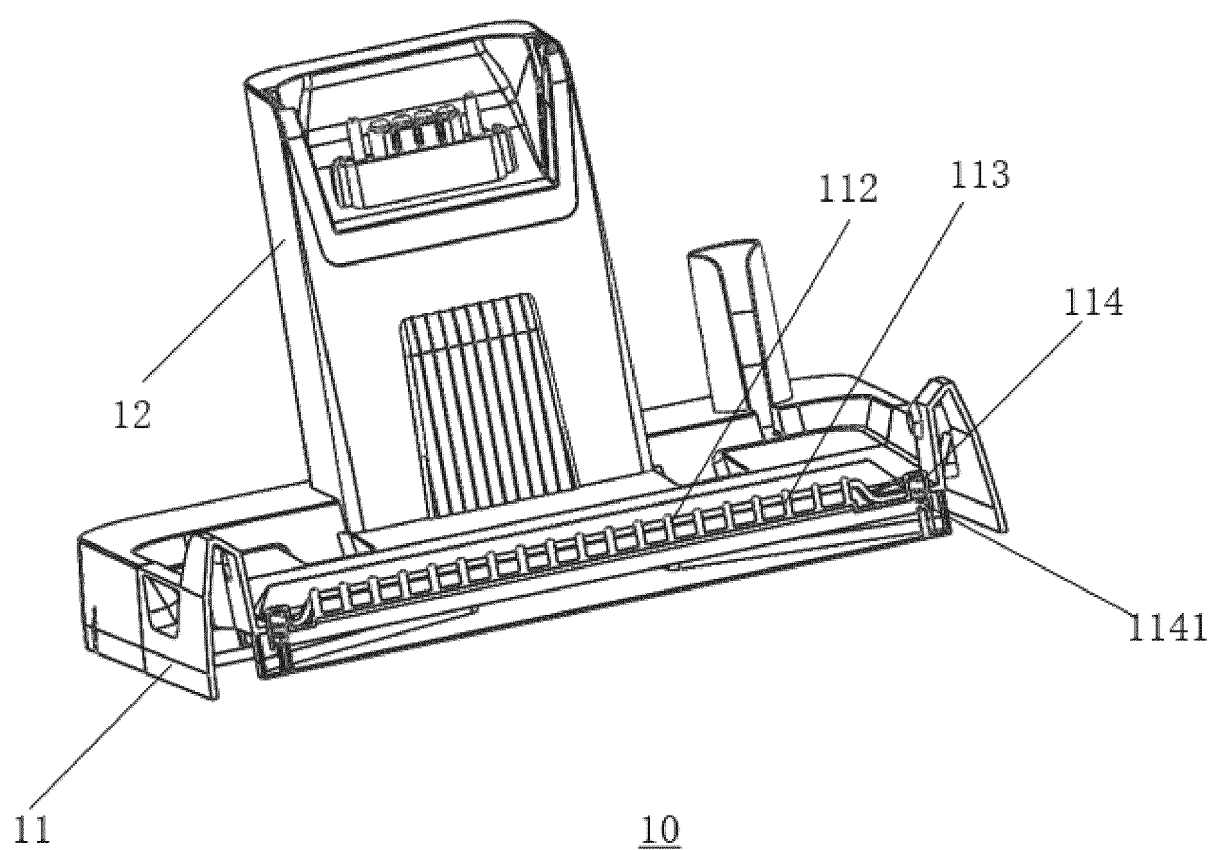


FIG. 5

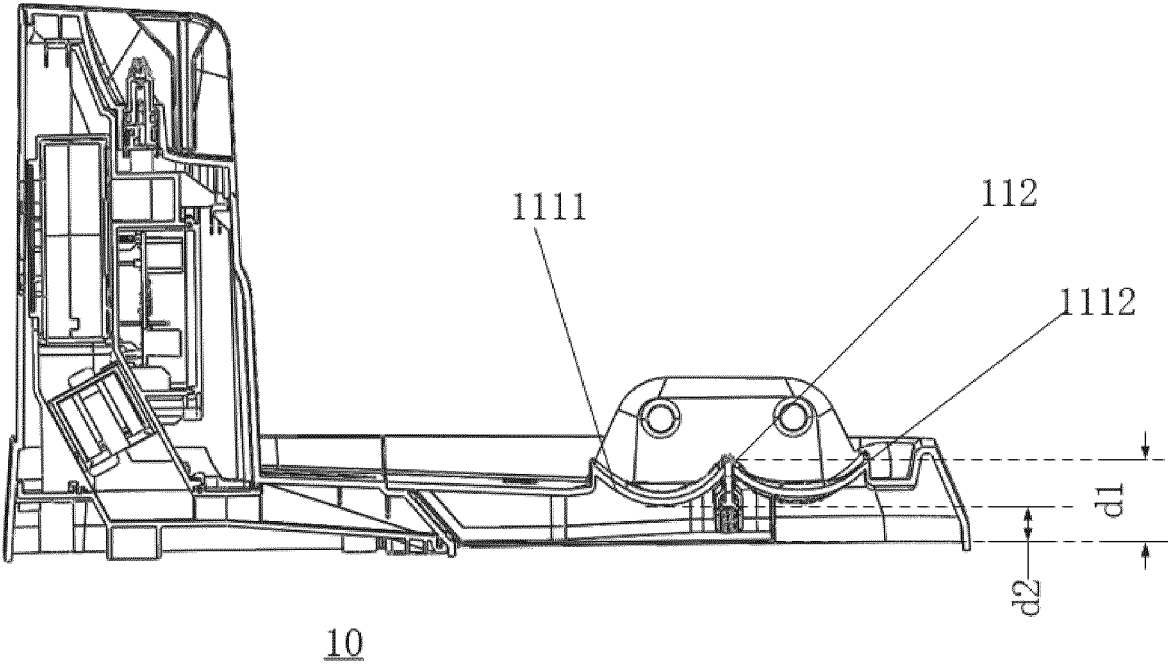


FIG. 6

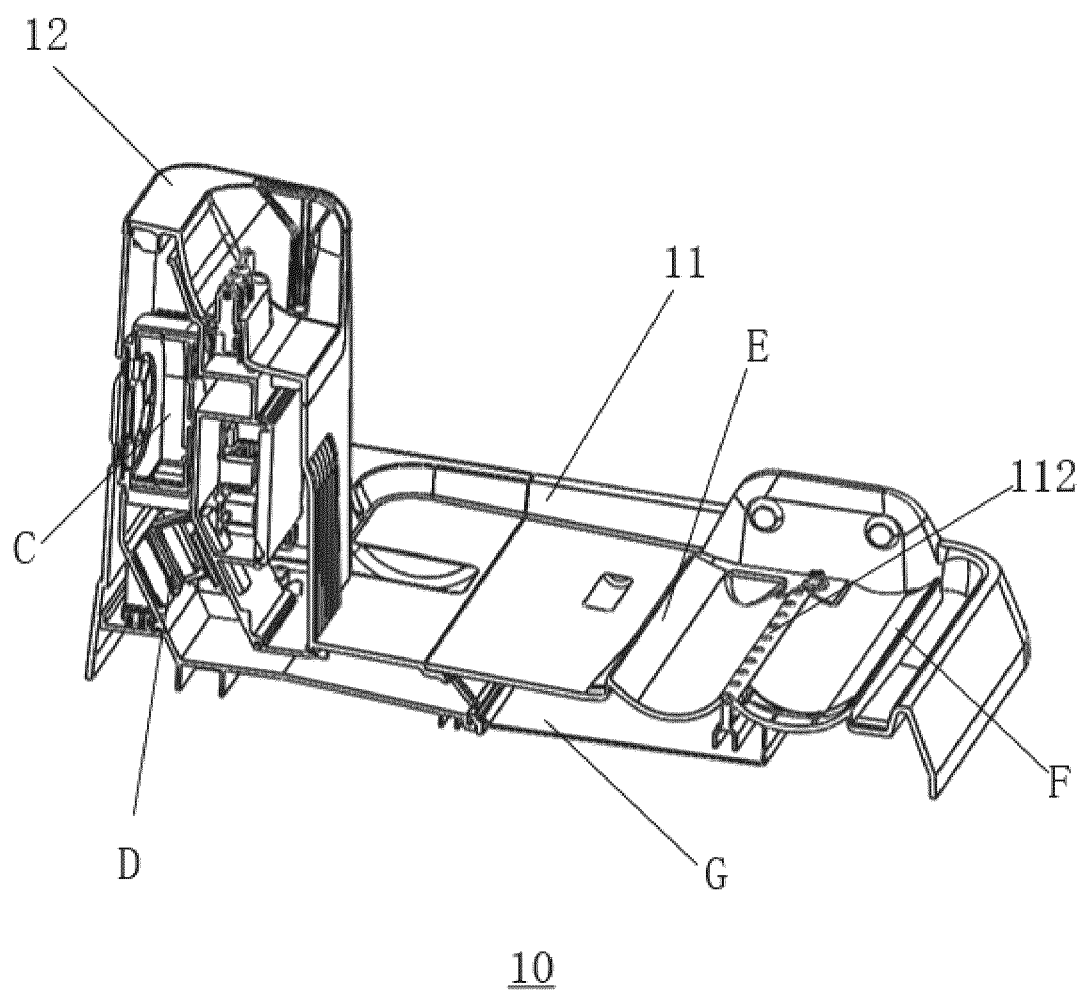


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/086649

A. CLASSIFICATION OF SUBJECT MATTER

A47L11/40(2006.01)i; A47L11/30(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)

IPC:A47L11

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, ENTXTC, ENTXT, WPABS, DWPI: 自清洁, 自清洗, 风干, 干燥, 烘干, 热气, 出风, 板, 孔, 口, 门, 挡板, 盖, 关, 翻, 启, 闭, 触发, 切换, 复位, 辊, 基站, 桩, 座, base, seat, clean, heat, dry, roll, brush

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 115251780 A (BEIJING ROBOROCK TECHNOLOGY CO., LTD.) 01 November 2022 (2022-11-01) claims 1-10, description, paragraphs [0107]-[0157], and figures 1-7	1-15
X	CN 216754378 U (NINGBO XINLE HOLDING GROUP CO., LTD.) 17 June 2022 (2022-06-17) description, paragraphs [0019]-[0025], and figures 1-5	1-15
X	CN 114617491 A (JIANGSU MIDEA CLEAN ELECTRIC APPLIANCE CO., LTD. et al.) 14 June 2022 (2022-06-14) description, paragraphs [0092]-[0313], and figures 1-18	1-15
A	CN 114711682 A (JOYOUNG CO., LTD.) 08 July 2022 (2022-07-08) entire document	1-15
A	CN 112716390 A (ZHUICHUANG TECHNOLOGY (SUZHOU) CO., LTD.) 30 April 2021 (2021-04-30) entire document	1-15

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

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“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

03 July 2023

Date of mailing of the international search report

07 July 2023

Name and mailing address of the ISA/CN

China National Intellectual Property Administration (ISA/CN)

China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2023/086649

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 213850504 U (NINGBO SAWADIKA ELECTRICAL APPLIANCE CO., LTD.) 03 August 2021 (2021-08-03) entire document	1-15
A	WO 2022133174 A2 (BISSELL INC.) 23 June 2022 (2022-06-23) entire document	1-15

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2023/086649

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Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
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CN 216754378 U	17 June 2022	None	
CN 114617491 A	14 June 2022	WO 2022121304 A1	16 June 2022
CN 114711682 A	08 July 2022	None	
CN 112716390 A	30 April 2021	None	
CN 213850504 U	03 August 2021	None	
WO 2022133174 A2	23 June 2022	None	

Form PCT/ISA/210 (patent family annex) (July 2022)

REFERENCES CITED IN THE DESCRIPTION

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