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(54) **CLEANING APPARATUS INTEGRATING ROLLER BRUSH AND DISC BRUSH**

(57) The present invention is a cleaning appliance equipped both a roller brush and a disc brush, and belongs to the field of floor washing and cleaning equipment. It includes a control rod with a brush plate hinged below; the latter includes a base plate and a squeegee is attached below it; the working ends of both the disc brush and the roller brush are set below the brush plate. The disk brush includes a first motor fixed on the upper surface of the base plate; the roller brush includes a bear-

ing hinge connected to the upper surface of the base plate. The invention can be applied to a variety of floors with stubborn and complex stains; its operation process is simple and does not require the user to replace any parts, thus greatly improving the efficiency; the combination of the roller brush and the disc brush allows the user to apply the product to clean complex stains directly without having to sweep the floor in advance, making the cleaning efficiency much higher.

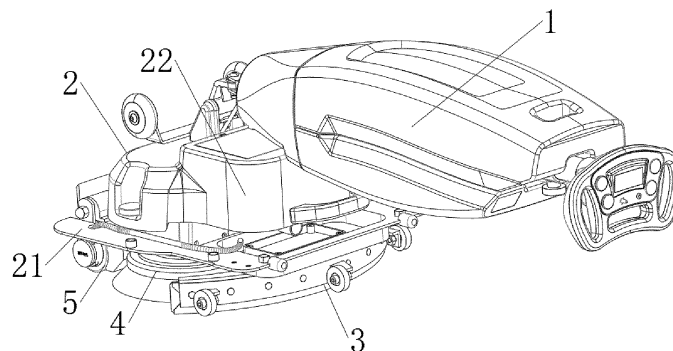


Fig. 1

Description

Technical field

[0001] The present invention is a cleaning appliance integrating a roller brush and a disc brush, and belongs to the field of floor washing and cleaning equipment.

Background information

[0002] At present, most cleaning machines in the domestic market can only be equipped with either the roller brush or the disk brush. The roller brush is effective in removing dust and particles, but it is helpless when there are stubborn stains on the floor; the disk brush has a good effect in removing stubborn stains, but it cannot work when there are large numbers of stone pieces, leaves or plastic bags, or else it will become tangled and damaged, thus reducing the cleaning effect. Although some machines support both roller and disk brushes, the replacement process is too complicated for the operator to perform alone, reducing the efficiency and resulting in high maintenance costs. As a result, a new type of cleaning equipment that integrates the roller brush and disk brush, which is not only capable of removing all kinds of dirt, but also easy to operate and economical, is urgently needed to solve the above problems.

Details of the invention

[0003] The invention aims to provide a new type of cleaning equipment integrating the roller brush and the disk brush, in order to solve the problem that conventional cleaning devices cannot be equipped with both the roller brush and the disk brush simultaneously, leading to reduced efficiency and high cost.

[0004] In order to achieve the goal, the invention presented here provides the following solution: a cleaning apparatus integrating a roller brush and a disk brush, including:

A control rod with a brush tray hinged beneath it; the brush tray includes a base plate, and a squeegee is attached to its underside.

[0005] The disc brush and the roller brush, the working terminals of the disc brush and the roller brush are set under the brush plate; the disc brush includes a first motor which is fixed on the upper surface of the base plate, and the output end of the first motor is connected to the brush plate holder, and the brush plate is fixed at the bottom of the brush plate holder; the roller brush includes a bearing hinge, which is fixed on the upper surface of the base plate, and the hinge end of the bearing hinge is connected to the hinge rod, and the other end of the hinge rod is connected to the second motor, and the output end of the second motor is fixed to the brush roller.

[0006] The brush tray includes a base plate with a protective cover fixed on its upper surface; the cover has a flap and an articulated seat above it, with a first hinge

member connected to one end of the articulated seat and a second hinge member connected to the other end, which is fixed at the end of the control lever near the brush tray; the upper surface of the base plate has a water stopper fixed on it, and the outer wall of the protective cover has a handle fixed on it.

[0007] The base plate has a through-hole and a limit slot, and the output shaft of the first motor is inside the through-hole, and there is an hinge rod inside the limit slot; the protective cover is fixed to the upper surface of the base plate by bolts, and one end of the flip cover is rotationally connected to the protective cover by hinges, and the other end of the flip cover is fastened to the protective cover by snaps.

[0008] The upper surface of the base plate is provided with a set of batteries, which corresponds to the lower part of the flap, and the lower surface of the base plate is fixed with a debris hopper, which is located between the brush roller and the brush tray and the interior of the debris hopper has a cavity structure.

[0009] The squeegee has a plastic holder, which is fixed to the lower surface of the base plate with screws; the first strip is fixed to one side of the squeegee and the second strip to the other side. The first locating plate is attached to the other side of the first strip and the second locating plate to the other side of the second strip. A screw runs through the second locating plate, the second strip, the plastic holder, the first strip and the first locating plate, which is connected with a nut outside; the outer wall of the second locating plate is connected with supporting wheels.

[0010] The interior of the plastic holder has a hollow structure, the first rubber strip has a slot at the bottom, the plastic holder has a curved structure, one side of the plastic holder is interconnected by a control rod through a conduit, the screw is provided with an external thread near the end of the nut, and the nut is threaded with the screw, the second locating plate is connected evenly with three support wheels at the end away from the second strip.

[0011] There are two groups of disc brushes, and the rotation direction of each group is towards their center. The brush plate holder is fixed on the output shaft of the first motor, and the clearance of the brush plate holder from the bottom of the base plate is two centimeters.

[0012] There are two bearing hinges, which are located at the two ends of the brush roller and the bend of the base plate and the water stopper; the hinged end of the bearing hinge is connected to the second motor by a rod; the length of the brush roller is smaller than that of the debris hopper.

[0013] Compared with the prior art, the present invention has the following benefits:

1. This appliance combines the roller brush and the disc brush and can be applied to all kinds of floors where there are heavy and complicated stains; its simple operation does not require the user to replace

any component so that the working efficiency is greatly boosted; the combination of the roller brush and the disc brush enables users to apply the product directly without needing to sweeping the floor in advance. The product is able to bring better cleaning effects and is easy to be transported and stored; its combination of the roller brush and the disc brush does not require additional components, so that is cost-saving and eco-friendly.

2. This appliance integrating the roller brush and the disc brush can collect garbage of large diameter in order to reduce its influence on the disc brush, thus improving its working efficiency. At the same time, the hinged connection of the roller brush enable users to realize 90° adjustment according to the actual situation and increase its practicality. The horizontal storage design is also convenient for users to dump the garbage.

3. The appliance integrating the roller brush and the disc brush is capable of removing stubborn impurities on the ground through its disc brush, and increasing the cleaning effects through the incorporation of the spray device.

4. The appliance integrating the roller brush and the disc brush is capable of recycling sewage through its squeegee, in order to further increasing the cleaning effects, reducing residuals and drying the floor instantly. The combination of the roller brush, the disc brush and the squeegee maximizes the cleaning efficiency and makes the appliance suitable for use in all kinds of floors where there are heavy and complicated impurities.

Description on the Figures

[0014]

Fig. I: the overall structure of the appliance;
Fig. II: the overall structure of the appliance (folded);
Fig. III: enlarged overview of the part A in Fig. I;
Fig. IV: the battery set of the appliance;
Fig. V: the structure of the brush plate;
Fig. VI: the structure of the disc brush;
Fig. VII: the structure of the squeegee;
Fig. VIII: the structure of the debris hopper;
Fig. IX: the structure of the roller brush.

[0015] In the figures:

1. Control rod; 2. Brush plate assembly; 21. Base plate; 22. Protective cover; 23. Flip cover; 24. Hinged seat; 25. First hinge member; 26. Second hinge member; 27. Handle; 28. Water stopper; 3. Squeegee; 31. Plastic holder; 32. First strip; 33. Second strip; 34. First locating plate; 35. Second locating plate; 36. Screw; 37. Nut; 38. Supporting wheel; 4. Disc brush; 41. First motor; 42. First

motor seat; 43. Brush disc; 5. Roller brush; 51. Bearing hinge; 52. Hinge rod; 53. Brush roller; 54. Second motor; 6. Debris hopper; 7. Battery set

5 Detailed implementation methods

[0016] The following section will provide a clear and complete description of the technical solutions therein in conjunction with the accompanying drawings in the embodiments of the present invention. Obviously, the described embodiments are only a portion of the present invention, not all of them. Based on the embodiments in the present invention, all others obtained by a person of ordinary skill in the art without making inventive labor fall within the scope of protection of the present invention.

[0017] Please refer to Figs. 1-9, one embodiment of the present invention:

A cleaning device that integrates a roller brush and a disc brush, including: the control rod 1, the brush disc assembly 2, the first motor 41, the brush disc 43, the bearing hinge 51, the second motor 54 and the battery set 7; these are all products available on the market, and their principles and connection methods are known to the skilled person in the field of prior art, so they are not discussed here.

[0018] Control rod 1, which contains the controller, the recovery tank, the solution tank and the suction motor, etc. and is capable of supplying clear water and recycling sewage simultaneously during the cleaning process, so as to realize high-efficiency cleaning of the ground; under the control rod 1 is hinged the brush plate assembly 2, which includes the base plate 21; the squeegee 3 is connected to the bottom of the brush plate assembly 2.

[0019] The disk brush 4 and the roller brush 5, both of which have their working ends below the brush plate 2; the disk brush 4 includes a first motor 41, which is fixed on the upper surface of the base plate 21; the output end of the first motor 41 is connected to the brush plate holder 42, and the brush plate holder 42 has a brush plate 43 at the bottom; the roller brush 5 includes a bearing hinge 51, which is fixed on the upper surface of the base plate 21; the hinge end of the bearing hinge 51 is connected to the hinge rod 52, the other end of the latter connected to the second motor 54; the output end of the second motor 54 is fixed with the brush roller 53. Through the joint operation of the disk brush 4 and the roller brush 5, the device can firstly recycle large-diameter garbage to the debris hopper 6 through the rotation of the brush roller 53 and further remove stubborn stains on the ground through the rotation of the brush disk 43, so as to realize high-efficiency cleaning of the ground.

[0020] Furthermore, the brush plate 2 includes a base plate 21, the upper surface of the latter is fixed with a protective cover 22, the upper part of the protective cover 22 is hinged with a flip cover 23, the upper part of the protective cover 22 is penetrated with an hinged seat 24, the other end of the hinged seat 24 is hinged with a first hinge member 25, the other end of the first hinge member

25 is hinged with a second hinge member 26, the second hinge member 26 is fixed at the end of the lever 1 near the brush plate 2. The upper surface of the base plate 21 is fixed with a water stopper 28, and the outer wall of the protective cover 22 is fixed with a handle 27; the handle 27 facilitates the hand-held movement of the lever 1 and the brush plate 2 after they are folded and stored, thus facilitating the portable movement of the device. The structure is set up to realize the auxiliary installation and positioning of squeegee 3, the disc brush 4 and the roller brush 5, and the structure is connected to the control rod 1, so that the two can be adjusted when used or stored, thus realizing different states of operation.

[0021] Furthermore, the base plate 21 has a through-hole and a limit slot, and the through-hole is penetrated by the output shaft of the first motor 41, and the limit slot is provided with an hinge rod 52, and the limit slot facilitates the adjustment of the hinge rod 52, and the protective cover 22 is fixed to the upper surface of the base plate 21 by bolts, and one end of the flip cover 23 is rotatably connected to the protective cover 22 by hinges, and the other end of the flip cover 23 is snapped to the protective cover 22 by clasps, which facilitates the opening and closing of the flip cover 23 by the clasps.

[0022] Furthermore, the upper surface of the base plate is the battery set 7, which corresponds to the lower part of the flip cover 23; the battery set 7 is mainly used for power supply, so that the electronic parts can be driven and controlled; the lower surface of the base plate 21 is fixed with a debris hopper, which is between the brush roller 53 and the brush plate 43; the debris hopper 6 has a cavity structure inside and is used for depositing large garbage, in order to avoid damaging the brush plate 43; at the same time, the debris hopper 6 can be installed flexibly (such as plugging), so as to facilitate its installation and removal. When there is a large amount of garbage in the debris hopper 6, the user can rotate the brush roller 53 to remove the debris hopper 6 and discharge the garbage; if a fixed connection structure is applied, the user can rotate the brush roller 53 and then pull out the garbage inside, or hold the brush plate 2 and take out the garbage inside the debris hopper 6.

[0023] Furthermore, the squeegee 3 includes a plastic holder 31, which is bolted to the lower surface of the base plate 21; the plastic holder 31 has a first strip 32 on one side and a second strip 33 on the other side; the first strip 32 has a first locating plate 34 on the other side, and the second strip 33 has a second locating plate 35 on the other side; the second locating plate 35, the second strip 33, the plastic holder 31, the first strip 32 and the first locating plate 34 have a screw 36 running through the inside, and the screw 36 has the nut 37 attached to its outside. The outer wall of the second locating plate 35 is connected with the supporting wheel 38. The structure can concentrate the ground sewage and recycle it to the recovery tank through the drive of the suction motor inside the control rod 1, thus realizing high-efficiency cleaning of the ground.

[0024] Furthermore, the interior of the plastic rake 31 has a hollow structure, and the bottom of the first strip 32 is provided with a through slot. The plastic holder 31 has a curved structure, which facilitates the concentration and collection of sewage on the ground. The sewage is then recycled through the slot at the bottom of the first strip 32 and collected between the second strip 33 and the first strip 32, and then through the cavity of the plastic holder 31 and the external pipe to achieve the recycling of the sewage. One side of the plastic holder 31 is connected by the control rod 1 through the conduit, the end of the screw 36 near the nut 37 has an external thread, and the nut 37 is threaded to the screw 36, and the end of the second locating plate 35 away from the second strip 33 is connected to three supporting wheels 38. Through the threaded connection of screw 36 and nut 37, the second locating plate 35 and the first locating plate 34 can be extruded, so that both of them can be extruded closer to the plastic holder 31 to complete the installation and positioning of the first strip 32 and the second strip 33.

[0025] Furthermore, there are two groups of the disc brush 4, there rotation direction of both being towards the center of the brush plates 43. The brush plate holder 42 is fixed on the output shaft of the first motor 41, and the clearance of the brush plate holder 42 from the bottom of the base plate 21 is two centimeters. With the function of the first motor 41, the brush plate holder 42 and the brush plate 43 are driven, thus realizing the cleaning work.

[0026] Furthermore, there are two bearing hinges 51 at the two ends of the brush roller 53 and the bend of the base plate 21 and the water stopper 28. The hinged end of the bearing hinge 51 is connected to the second motor 54 via the hinge rod 52. The length of the brush roller 53 is smaller than that of the debris hopper 6. The bearing hinge 51 is mainly used for both vertical and horizontal support and positioning, and can be positioned autonomously after rotation, so that the angle of the brush roll 53 can be adjusted. By energizing the second motor 54, the brush roller 53 can be driven so as to collect large garbage on the ground and recycle them into the debris hopper 6.

Working principle

[0027] When using the appliance, the operator first rotate the brush roller 53 to make it perpendicular to the ground, then through the articulation of the control rod 1 and the brush plate 2, adjust the control rod 1 so that it can be held by hands, in order to realize the cleaning work of the ground. With the power supply of the battery set 7, the second motor 54 and the first motor 41 are driven simultaneously, the second motor 54 further drives the brush roller 53 so that it is able to recycle large garbage on the ground into the debris hopper 6. Furthermore, through the rotation of the brush plate 43, the appliance is able to remove stubborn stains on the ground.

Simultaneously, the incorporation of the spray device will further improve the cleaning effects. The device collects the sewage through the first strip 32 and the second strip 33, and through the operation of the suction motor, together with the duct and the plastic rake 31, it realizes the adsorption and collection of the sewage, thus realizing high-efficiency cleaning of the ground.

[0028] It is apparent to those skilled in the art that the present invention is not limited to the exemplary embodiment described above, but is capable of being realized in other specific forms without departing from its essential features. Therefore, the embodiment should be regarded as exemplary and non-limiting from either point of view. The scope of the present invention is limited by the accompanying claims and not by the above description, and is therefore intended to encompass all variations that fall within the meaning and scope of the equivalent elements of the claims. Any appended markings in the claims should not be considered as limiting the claims involved.

Claims

1. A cleaning device integrating a roller brush and a disc brush, **characterized by:**
a control rod (1), a brush plate (2) hinged below the control rod (1), a brush plate (2) including a base plate (21), a squeegee (3) connected below the brush plate (2); a disc brush (4) and a roller brush (5), the working ends of both the disc brush (4) and the roller brush (5) are set below the brush plate (2), the disc brush (4) including a first motor (41), the first motor (41) fixed to the base plate (21); the output end of the first motor (41) is connected to the brush plate holder (42), the bottom of the brush plate holder (42) is fixed to the brush plate (43), the roller brush (5) includes a bearing hinge (51), the bearing hinge (51) is fixed to the upper surface of the base plate (21), the hinge end of the bearing hinge (51) is connected to the hinge rod (52), the other end of the hinge rod (52) is connected to the second motor (54), and the output end of the second motor (54) is fixed with a brush roller (53).
2. A cleaning apparatus integrating a roller brush and a disc brush according to claim 1, **characterized in that:** the brush tray (2) includes a base plate (21) with a protective cover (22) attached to the upper surface of the base plate (21), a flap (23) hinged above the cover (22), a hinge seat (24) connected above the cover (22), a first hinge member (25) connected at the other end of the hinge seat (24), a second hinge member (26) connected at the other end of the first hinge member (25), the second hinge member (26) connected to the end of the control rod (1) near the brush tray assembly (2), a water stopper (28) fixed to the upper surface of the base plate (21), and a grip (27) fixed to the outer wall of the cover (22).
3. A cleaning apparatus integrating a roller brush and a disc brush according to claim 1, **characterized in that:** the base plate (21) has a through-hole and a limit slot, and the output shaft of the first motor (41) is inside the through-hole, and the limit slot has a hinge rod (52) inside the slot, and the guard (22) is bolted to the upper surface of the base plate (21), and one end of the flap (23) is connected to the guard (22) by a hinge in a rotating manner, and the other end of the flap (23) is connected to the guard (22) by a snap.
4. A cleaning apparatus integrating a roller brush and a disc brush according to claim 1, **characterized in that:** there is a set of batteries (7) on the upper surface of the base plate (21); the set of batteries (7) corresponds to the bottom of the flap (23); there is a debris hopper (6) fixed on the lower surface of the base plate (21), and the debris hopper (6) is located between the brush roller (53) and the brush plate (43), and the interior of the debris hopper (6) has a cavity structure.
5. A cleaning apparatus integrating a roller brush and a disc brush according to claim 1, **characterized in that:** the squeegee (3) has a plastic holder (31), the plastic holder (31) is bolted to the lower surface of the base plate (21), the plastic holder (31) is provided with a first strip (32) on one side and a second strip (33) on the other side; the other side of the first strip (32) is the first locating plate (34), the other side of the second strip (33) is the second locating plate (35), the second locating plate (35), the second rubber strip (33), the plastic holder (31), the first strip (32) and the first locating plate (34) have screws (36) inside, screws (36) are connected with nuts (37) outside, and the second locating plate (35) is connected with support wheels (38) on the outer surface.
6. A cleaning apparatus integrating a roller brush and a disc brush according to claim 5, **characterized in that:** The plastic holder (31) has a hollow structure inside; the bottom of the first strip (32) has a through slot; the plastic holder (31) has a curved structure; one side of the plastic holder (31) is interconnected by the control rod (1) through the conduit, the screw (36) is provided with an external thread near the end of the nut (37), and the nut (37) is threaded to the screw (36), the second locating plate (35) is evenly connected with three support wheels (38) at the end away from the second strip (33).
7. A cleaning apparatus integrating a roller brush and a disc brush according to claim 1, **characterized in that:** there are two groups of brush plates (4), and the rotation direction of each group (43) is toward

the center brush plates (43); the brush plate holder (42) is fixed on the output shaft of the first motor (41), and the clearance of the brush plate holder (42) from the bottom of the base plate (21) is two centimeters.

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8. A cleaning apparatus integrating a roller brush and a disc brush according to claim 1, **characterized in that:** there are two bearing hinges (51), which are at the two ends of the brush roll (53), and the bend of the base plate (21) and the water stopper (28) respectively; the ends of the bearing hinges (51) are connected to the second motor (54) through the hinge rod (52), and the length of the brush roll (53) is smaller than that of the debris hopper (6).

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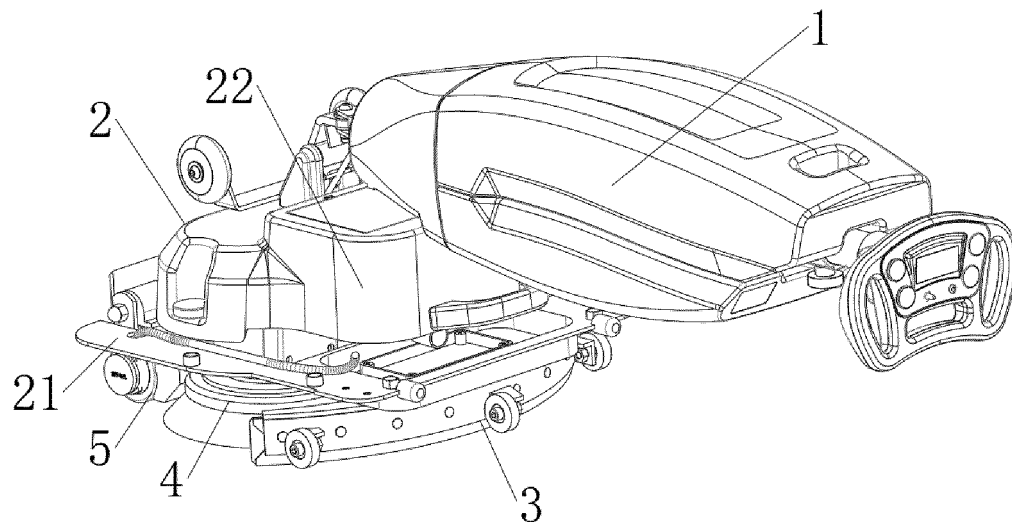


Fig. I

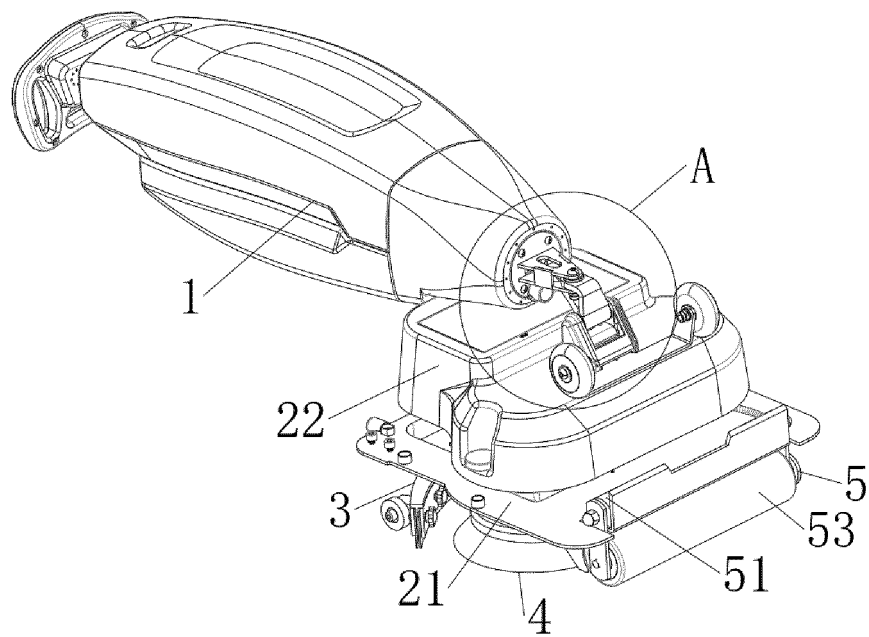


Fig. II

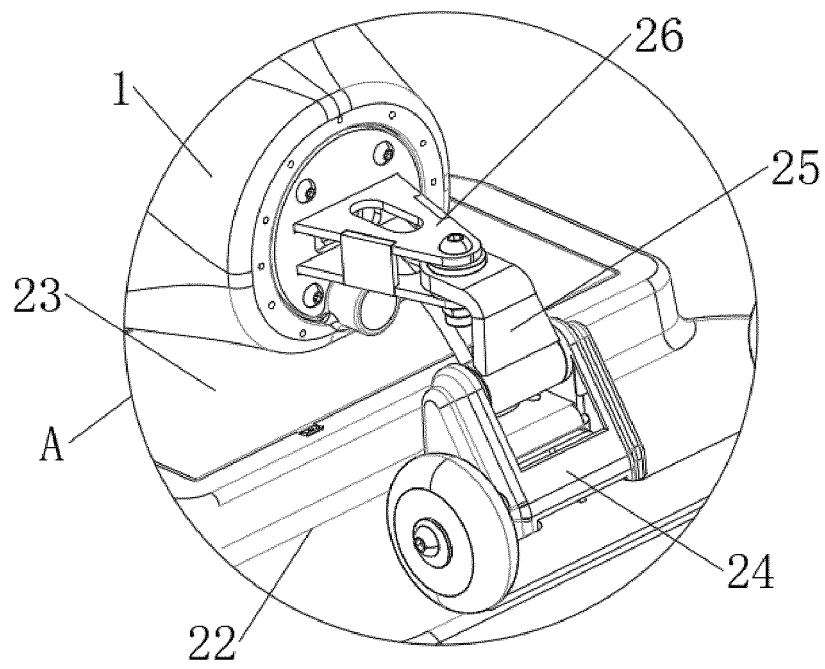


Fig. III

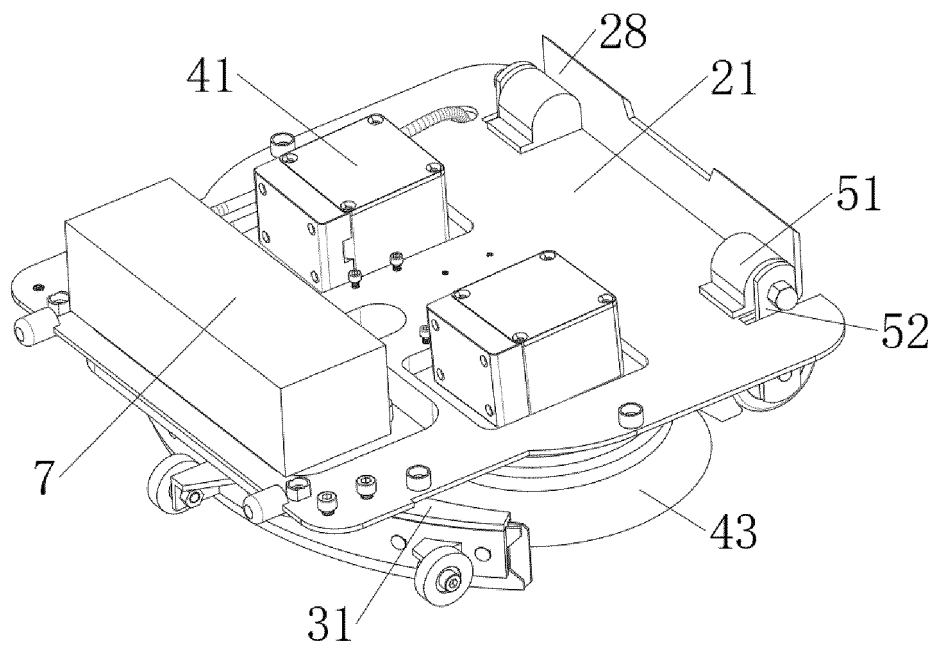


Fig. IV

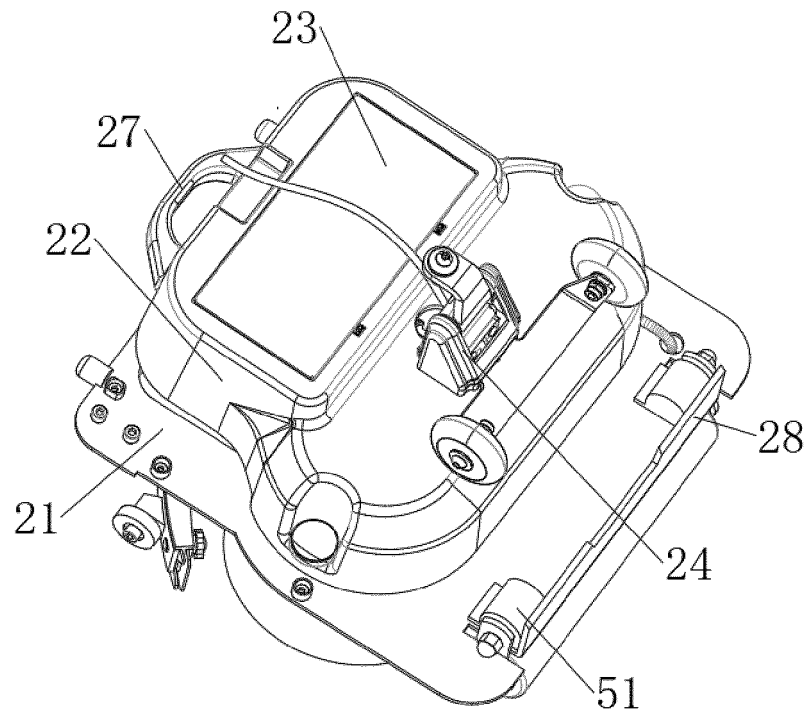


Fig. V

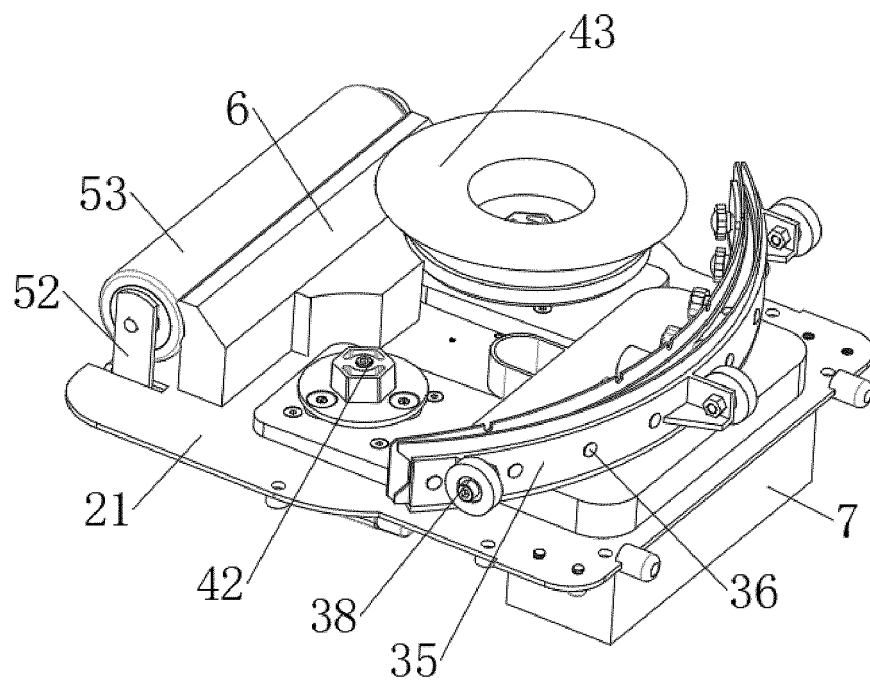


Fig. VI

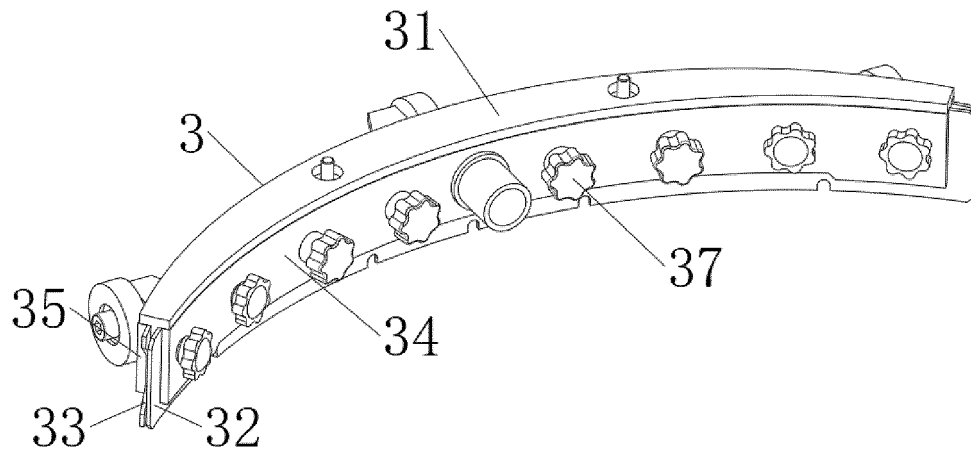


Fig. VII

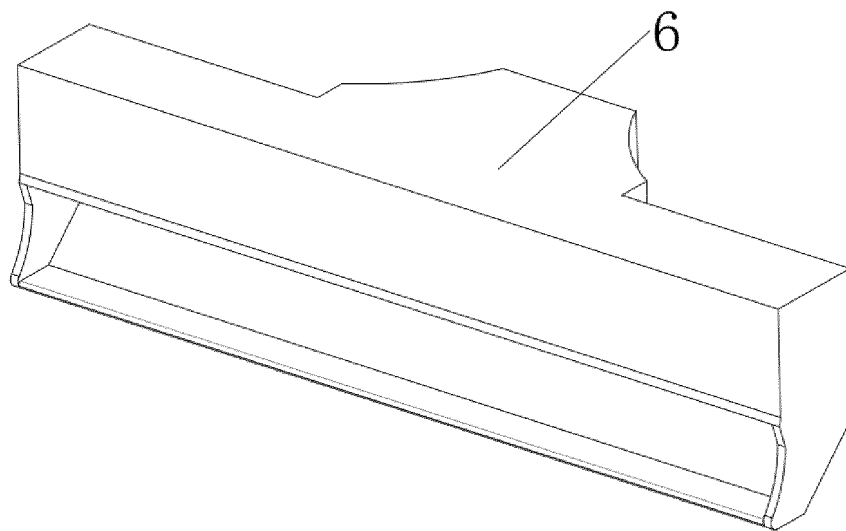


Fig. VIII

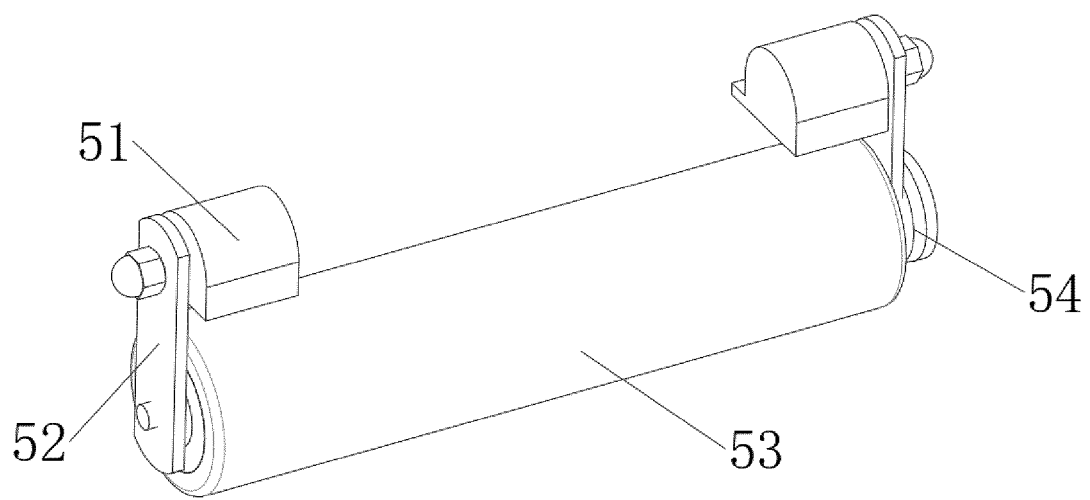


Fig. IX

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/100141

A. CLASSIFICATION OF SUBJECT MATTER

A47L11/30(2006.01)i; A47L11/40(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: A47L, E01H

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)

CNABS, CNTXT, WPABSC, ENTXTC, ENTXT, VEN: 滚刷, 辊, 盘刷, 刷盘, 吸水, 铰接, 转动, brush+, roll+, disc, rotat+, water, absorb+, absorption, scraper, rake, raking, hinge

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	CN 219516127 U (ANHUI YANGZI INTELLIGENT MANUFACTURING CO., LTD.) 15 August 2023 (2023-08-15) claims 1-8	1-8
Y	CN 115381348 A (CANDELA (SHENZHEN) TECHNOLOGY INNOVATION CO., LTD.) 25 November 2022 (2022-11-25) description, paragraphs 41-96, and figures 1-11	1-8
Y	CN 214632021 U (LONG DONGMING) 09 November 2021 (2021-11-09) description, paragraphs 49-66, and figures 1-10	1-8
Y	CN 111714038 A (SUZHOU GAOZHIXIAN AUTOMATION TECHNOLOGY CO., LTD.) 29 September 2020 (2020-09-29) description, paragraphs 40-58, and figures 1-12	1-8
A	CN 216317413 U (ANHUI CHENGXI TECHNOLOGY CO., LTD.) 19 April 2022 (2022-04-19) entire document	1-8

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

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“&” document member of the same patent family

Date of the actual completion of the international search

11 October 2023

Date of mailing of the international search report

11 October 2023

Name and mailing address of the ISA/CN

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Beijing 100088

Authorized officer

Telephone No.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2023/100141

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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	CN 115530696 A (ZHUHAI GREE ELECTRIC APPLIANCES INC.) 30 December 2022 (2022-12-30) entire document	1-8
A	EP 3569128 A2 (I MOP GMBH) 20 November 2019 (2019-11-20) entire document	1-8

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2023/100141

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 219516127 U	15 August 2023	None	
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