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(54) ROLLING BRUSH AND CLEANING DEVICE

(57) The application provides a roller brush and a cleaning device, and relates to the technical field of cleaning devices. The roller brush includes a roller body (10) and a plurality of cleaning assemblies (20) provided on an outer surface of the roller body (10) along an axial direction of the roller body (10) and spaced from each other in a circumferential direction of the roller body (10). The cleaning assembly (20) includes a brush strip (21) and two support strips (22), which all extend helically from a first end of the roller body (10) to a second end of the roller body (10), with the brush strip (21) being located between the two support strips (22). A distance between the two support strips (22) of the same cleaning assembly (20) in the circumferential direction of the roller body (10) is less than a distance between two adjacent cleaning assemblies (20) in the circumferential direction of the roller body. The support strips (22) at both sides of the brush strip (21) can support the filament swept out, increasing the circumference of the roller brush on which the filament is wound, and reducing the probability that the filament is wound more than one turn on the roller brush. Therefore, the filament is not easy to be wound on the roller brush and does not affect the operation of the roller brush, which is conducive to improving the cleaning effect of the filament on the surface of the objects such as carpet.

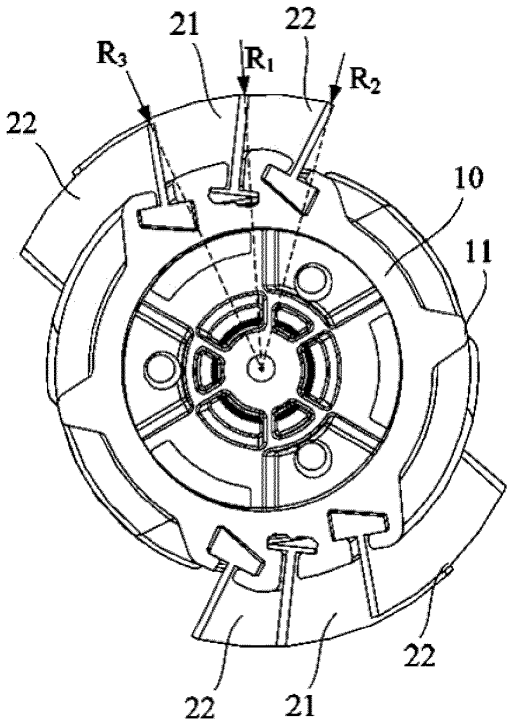

FIG. 7

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Description

[0001] This application claims the priority to the Chinese Patent Application No. 202311237267.8, titled "ROLLER BRUSH, ROLLER BRUSH ASSEMBLY AND CLEANING APPARATUS" and filed on September 22, 2023, and the Chinese Patent Application No. 202311245939.X, titled "ROLLER BRUSH AND CLEANING APPARATUS" and filed on September 22, 2023, which are incorporated herein by reference in their entirety.

FIELD

[0002] The present application relates to the technical field of cleaning devices, and in particular to a roller brush and a cleaning device.

BACKGROUND

[0003] A cleaning device is a kind of household appliance commonly used to clean dust, dirt and other debris from surfaces of floors, carpets, furniture, etc.

[0004] The cleaning device generally includes a body and a roller brush located in the body and rotatably connected to the body. During the use of the cleaning device, the roller brush rolls on the surface of the object being cleaned. As the roller brush rolls on the surface of the object, it picks up the dust and other debris from the surface of the object, which is sucked into the body under the effect of suction.

[0005] During the use of the current cleaning device, it is difficult to clean the surface of the objects, such as carpets, having tufted fluffs, since various debris are easy to hide between the fluffs, especially, the filaments such as hairs entangled in the depth of the fluffs.

SUMMARY

[0006] An embodiment of the application provides a roller brush and a cleaning device, which is conducive to improving the cleaning effect of the filaments from the surface of the objects such as carpets. The solutions are summarized below.

[0007] In a first aspect, the embodiment of the application provides a roller brush which is applied to a cleaning device. The roller brush includes a roller body and a plurality of cleaning assemblies. The plurality of cleaning assemblies are provided on an outer surface of the roller body along an axial direction of the roller body, and are spaced from each other in a circumferential direction of the roller body.

[0008] The cleaning assembly includes a brush strip and two support strips, which all extend helically from a first end of the roller body to a second end of the roller body, with the brush strip being located between the two support strips. A distance between the two support strips of the same cleaning assembly in the circumferential direction of the roller body is less than a distance between two adjacent cleaning assemblies in the circumferential direction of the roller body.

[0009] In some examples, a distance R_1 from an outer edge of the brush strip to an axis of roller body, a distance R_2 from an outer edge of one of the two support strips to the axis of roller body, and a distance R_3 from an outer edge of the other of the two support strips to the axis of roller body satisfies the following relation:

R_1 is greater than R_2, and R_1 is greater than R_3.

[0010] In some examples, a difference between R_1 and R_2 is less than or equal to 3 mm, and a difference between R_1 and R_3 is less than or equal to 3 mm.

[0011] In some examples, the roller brush comprises two cleaning assemblies, and two support ribs are provided on a surface of the roller body and extend helically along the axial direction of the roller body. The two support ribs and the two cleaning assemblies are alternately arranged in the circumferential direction of the roller body.

[0012] In some examples, the two cleaning assemblies are arranged symmetrically about a center of the roller body, and the two support ribs are arranged symmetrically about the center of the roller body. Any of the two support ribs is equidistant from the two cleaning assemblies in the circumferential direction of the roller body.

[0013] In some examples, each of the support strips includes a first mounting portion and a support portion. The first mounting portion is in a shape of strip. The support portion is connected to a side of the first mounting portion. A second fillet corner is provided at junction of the support portion and the first mounting portion and has a radius larger than a second radius threshold. The first mounting portion is connected to the roller body. A first T-shaped groove is provided on a surface of the roller body, and has a first fillet corner at its opening and a radius larger than a first radius threshold. The first mounting portion is located in the first T-shaped groove.

[0014] In some examples, the roller brush further includes a first end cover detachably connected to the first end of the roller body.

[0015] In the same cleaning assembly, at least one support strip has an end inserted between the first end cover and the roller body, and the first end cover is configured to enable the part of the support strip located between the first end cover

and the roller body to be bent towards the roller body.

[0016] In some examples, the first end cover includes a mounting disc and a first limiting plate connected to a side of the mounting disc. The mounting disc is arranged to face an end face of the roller body. There is a clearance between the first limiting plate and an outer side wall of the roller body, and at least one support strip is located in the clearance and abuts against an inner side wall of the first limiting plate.

[0017] In some examples, the first limiting plate is provided with a first notch, and at least a part of the brush strip is located in the first notch.

[0018] In some examples, in the same cleaning assembly, at least a part of one of the support strips is located in the first notch.

[0019] Alternatively, in the same cleaning assembly, the two support strips are at least partially inserted between the first end cover and the roller body.

[0020] In some examples, the first end cover further includes a plurality of second limiting plates connected to the same side of the mounting disc as the first limiting plate. The plurality of second limiting plates are arranged along an edge of the mounting disc and spaced from each other. The second limiting plates are in transition fit with the outer side wall of the roller body, and the first limiting plate is located between two adjacent second limiting plates.

[0021] In some examples, a minimum clearance between the second limiting plates and the outer side wall of the roller body is less than or equal to 0.2 mm.

[0022] In a second aspect, the embodiment of the application further provides a cleaning device, including a body and the roller brush as stated above in the first aspect. The body is provided with a roller brush mounting groove, and the roller brush is located in the roller brush mounting groove and rotatably connected to the body.

[0023] The solutions according to the embodiments of the present application have at least the following advantages.

[0024] The plurality of cleaning assemblies is arranged on the outer surface of the roller body and each cleaning assembly include the brush strip and two support strips. The brush strip and two support strips each extend helically on the surface of the roller body, and the brush strip is located between the two support strips. When cleaning the object such as carpet to be cleaned, one of the support strips can contact the object to be cleaned before the brush strip, and push away the tufted fluffs on the surface of the object to be cleaned. After the brush strip performs cleaning, the other support strip contacts the surface of the object to be cleaned again, and sweep away the debris that the brush strip picks up. In the cleaning process, the support strips at both sides of the brush strip can support the filament swept out, increasing the circumference of the roller brush on which the filament is wound, and reducing the probability that the filament is wound more than one turn on the roller brush. Therefore, the filament is not easy to be wound on the roller brush and does not affect the operation of the roller brush, which is conducive to improving the cleaning effect of the filament on the surface of the objects such as carpet.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] In order to more clearly illustrate the technical solutions in the embodiments of the present application, the drawings that need to be used in description of the embodiments or the prior art will be briefly introduced below. It is obvious that the drawings in the following descriptions only illustrate some embodiments of the present application, and other drawings may be obtained by those skilled in the art based on these drawings without creative efforts.

FIG. 1 is a schematic structural view of a cleaning device provided in an embodiment of the present application;
FIG. 2 is a bottom view of a cleaning device provided in an embodiment of the present application;
FIG. 3 is a sectional view taken along line I-I in FIG. 2;
FIG. 4 is a schematic partial structural view of a cleaning device provided in an embodiment of the present application;
FIG. 5 is a schematic structural view of a roller brush provided in an embodiment of the present application;
FIG. 6 is a schematic diagram of a cross section of a roller brush provided in an embodiment of the present application;
FIG. 7 is a schematic sectional view of a roller brush provided in an embodiment of the present application;
FIG. 8 is a schematic structural view of a support strip provided in an embodiment of the present application;
FIG. 9 is a schematic partial structural view of a support strip provided in an embodiment of the present application;
FIG. 10 is a schematic sectional view of a roller body provided in an embodiment of the present application;
FIG. 11 is a schematic sectional view of a brush strip provided in an embodiment of the present application;
FIG. 12 is a schematic structural view of a first end cover provided in an embodiment of the present application;
FIG. 13 is a schematic view showing assembling of a first end cover provided in an embodiment of the present application;
FIG. 14 is a schematic structural view of a second end cover provided in an embodiment of the present application;
FIG. 15 is a schematic partial structural view of a roller brush provided in an embodiment of the present application; and
FIG. 16 is a schematic partial structural view of a cleaning device provided in an embodiment of the present

application.

[0026]

Description of reference numerals:

100	body;	200	roller brush;	100a	roller brush mounting groove;
100b	suction port;	300	comb strip;	400	power mechanism;
500	transmission mechanism;	10	roller body;	11	support rib;
20	cleaning assembly;	21	brush strip;	22	support strip;
221	first mounting portion;	222	support portion;	223	second fillet corner;
10a	first T-shaped groove;	10b	first fillet corner;	10c	third fillet corner;
2211	first section;	2212	second section;	224	flexible cloth;
225	stop block;	211	second mounting portion;	212	bristle;
10d	second T-shaped groove;	31	first end cover;	32	second end cover;
311	mounting disc;	312	first limiting plate;	313	second limiting plate;
313a	second notch;	314	transition plate;	312a	first notch;
321	gap covering rib;	301	first comb tooth;	302	second comb tooth;
A	first intersection point;	B	second intersection point;	C	third intersection point;
D	fourth intersection point.				

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0027] In the following description, particular details such as specific system structure or technology are presented for the purpose of illustration rather than limitation, so as to thoroughly understand the embodiments of the present application. However, it should be clear to those skilled in the art that the present application may also be implemented in other embodiments that do not have these particular details. In other cases, the detailed description of well-known systems, devices, circuits and methods is omitted so as not to prejudice the description of the application with unnecessary details.

[0028] It should also be understood that the term "and/or" used in the description and the attached claims of this application refers to any combination and all possible combinations of one or more of the items listed in association, and includes such combinations.

[0029] It should be noted that, when an element is stated to be "fixed to" or "provided on" another element, it may be directly or indirectly on that another element. When an element is stated to be "connected" to another element, it may be directly or indirectly connected to that another element.

[0030] It should be understood that orientations or positional relationships indicated by the terms "length", "width", "upper", "lower", "front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outer", etc., are based on those shown in the drawings and are intended only to facilitate and simplify the description of the present application, and do not indicate or imply that the stated device or element must have a particular orientation, be constructed and operated in a particular orientation, and therefore cannot be construed as limiting the present application.

[0031] Furthermore, in, the terms "first", "second", "third", etc. in the description and the attached claims of the present application are only used to distinguish the description, and should not be construed as indicating or implying relative importance.

[0032] References to "an embodiment", "some embodiments" or the like in the description of the present application imply that the specific feature, structure or characteristic described in conjunction with that embodiment(s) is included in one or more of the embodiments of the present application. Thus, the expresses "in an embodiment", "in some embodiments", "in some other embodiments", "in some other embodiments", etc., which appear in various places of this specification, do not necessarily refer to the same embodiments, but mean "one or more, but not all, embodiments", unless otherwise specifically emphasized. The terms "comprising", "including", "having" and their variations all mean "including but not limited to", unless otherwise specifically emphasized. "Multiple" means two or more.

[0033] FIG. 1 is a schematic structural view of a cleaning device provided in an embodiment of the present application. As an example, the cleaning device may be a vacuum cleaner. FIG. 2 is a bottom view of a cleaning device provided in an embodiment of the present application. As shown in FIGS. 1 and 2, this cleaning device includes a body 100 and a roller brush 200. The body 100 has a roller brush mounting groove 100a. The roller brush 200 is positioned in the roller brush mounting groove 100a, and is rotatably connected to the body 100.

[0034] FIG. 3 is a section view taken along line I-I in FIG. 2. As shown in Fig. 3, the roller brush mounting groove 100a has a suction port 100b on one side wall thereof.

[0035] The cleaning device may further include a dust collector. The dust collector may be a dust box, a dust bag, or any other container that can contain debris. The dust collector is connected to the body 100, and the suction port 100b is communicated with the roller brush mounting groove 100a and the dust collector.

[0036] As shown in FIG. 3, the cleaning device further includes a comb strip 300 located between the roller brush 200 and the suction port 100b and connected to the body 100.

[0037] The comb strip 300 is configured to interact with the roller brush 200 during rotation of the roller brush 200, such that the debris (e.g., filaments such as hair) attached to the roller brush 200 is separated from the roller brush 200.

[0038] FIG. 4 is a schematic partial structural view of a cleaning device provided in an embodiment of the present application. As shown in FIG. 4, a power mechanism 400 and a transmission mechanism 500 are also provided in the body 100. The transmission mechanism 500 is drivingly connected to the power mechanism 400 and the roller brush 200 to drive the roller brush 200 to rotate. The transmission mechanism 500 may be drivingly connected to one end of the roller brush 200.

[0039] For example, the power mechanism 400 may include a motor, and the transmission mechanism 500 may be a belt transmission mechanism.

[0040] When using the cleaning device, the opening of the roller brush mounting groove 100a faces the surface of the object to be cleaned. The debris on the surface of the object to be cleaned is sucked into the roller brush mounting groove 100a under the effect of air flow, and enters the dust collector through the suction port 100b. In this process, a part of the debris directly enters the roller brush mounting groove 100a under the action of air flow and is then inhaled through the suction port 100b; and another part of the debris is separated from the surface of the object to be cleaned under the action of the roller brush 200, then enters the roller brush mounting groove 100a under the action of air flow, and then is inhaled through the suction port 100b.

[0041] FIG. 5 is a schematic structural view of a roller brush provided in an embodiment of the present application. The roller brush 200 is applied to a cleaning device. As shown in FIG. 5, the roller brush 200 includes a roller body 10 and a plurality of cleaning assemblies 20. The cleaning assemblies 20 are each arranged on the outer surface of the roller body 10 along the axial direction of the roller body 10, and are spaced from each other in the circumferential direction of the roller body 10.

[0042] As an example, the roller brush 200 includes cleaning assemblies 20 arranged in central symmetry. The efficiency of cleaning can be improved by providing multiple cleaning assemblies 20.

[0043] The cleaning assembly 20 includes a brush strip 21 and two support strips 22,which each extend helically from the first end of the roller body 10 to the second end of the roller body 10, with the brush strip 21 positioned between the two support strips 22. The distance between the two support strips 22 of the same cleaning assembly 20 in the circumferential direction of the roller body 10 is less than the distance between the two adjacent cleaning assemblies 20 in the circumferential direction of the roller body10.

[0044] Exemplarily, the first end of the roller body 10 may be the end drivingly connected to the transmission mechanism 500. The second end of the roller body 10 may be the end opposite to the first end of the roller body 10. A direction from the second end to the first end in the axis parallel to the roller body 10 is defined as a positive direction. The brush strip 21 and the support strips 22 may be right-handed structure. That is, when viewing from the second end to the first end, the brush strip 21 and the support strips 22 are each rotated in clockwise direction.

[0045] FIG. 6 is a schematic diagram of a cross section of a roller brush provided in an embodiment of the present application. As shown in FIG. 6, it shows a cross section of the roller brush 200, i.e., a section perpendicular to the axis of roller body 10. The outer edge of the support strips 22 and the outer edge of the brush strips 21 all exist in the cross section of the roller brush 200. For convenience, the point of the outer edge of each support strip 22 existing in a cross section of the roller brush 200 is defined as the first intersection point A; the point of the outer edge of each brush strip 21 existing in the cross section of the roller brush 200 is defined as the second intersection point B; and the point of the rotation axis of roller body 10 existing in the cross section is defined as the third intersection point C.

[0046] In the embodiment of the present application, the distance between two support strips 22 in the same cleaning assembly 20 in the circumferential direction of the roller body 10 may refer to the distance between the outer edges of the two support strips 22 in the same cleaning assembly 20 in the same cross section of the roller brush 200. In the same cleaning assembly 20 and in a cross section, this distance may be the straight-line distance between two first intersection points A, or may be the length of an arc between a ray extending from the third intersection point C and passing through one first intersection point A and the other ray extending from the third intersection point C and passing through the other first intersection point A. The center of this arc may be the third intersection point C, and at least one of the two first intersection points A may be the end point of the arc.

[0047] In the embodiment of the present application, the distance between two adjacent cleaning assemblies 20 in the circumferential direction of roller body 10 may refer to the distance between the outer edges of two brush strips 21 in the two adjacent cleaning assemblies 20 in the same cross section of the roller brush 200. This distance may be the length of an arc between one ray extending from the third intersection point C and passing through one second intersection point B and the other ray extending from the third intersection point C and passing through the other second intersection point B in two

adjacent cleaning assemblies 20 in a cross-section. The center of this arc may be the third intersection point C, and at least one of the two second intersection points B may be the end point of this arc.

[0048] In the embodiment of the present application, in the same cleaning assembly 20, the distance between the outer edge of the support strip 22 and the outer edge of the brush strip 21 may refer to the straight-line distance between the first intersection point A and the second intersection point B, or may be the length of an arc between a ray extending from the third intersection point C and passing through the first intersection point A and the other ray extending from the third intersection point C and passing through the second intersection point B, on the same cross section of the roller brush 200. The center of the arc may be the third intersection point C, and one of the end points of the arc may be the first intersection point A or the second intersection point B.

[0049] FIG. 7 is a schematic sectional view of a roller brush provided in an embodiment of the present application. As shown in FIG. 7, this roller brush 200 includes two cleaning assemblies 20, and two support ribs 11 provided on the surface of roller body 10. Each support rib 11 extends helically along the axial direction of the roller body 10. The two support ribs 11 and two cleaning assemblies 20 are alternately distributed in the circumferential direction of the roller body 10.

[0050] The larger the outer diameter of the roller body 10, the longer the minimum length of hair that may be wound outside the roller body 10, that is, the hair of the same length is more difficult to be wound outside the roller body 10 with larger outer diameter. The support rib 11 functions to increase the outer diameter of the roller body 10, so as to increase the difficulty that hair is wound outside the roller body 10.

[0051] As an example, the two cleaning assemblies 20 are symmetrically arranged about the center of the roller body 10, and the two support ribs 11 are symmetrically arranged about the center of the roller body 10. In the circumferential direction of the roller body 10, any one of the two support ribs 11 is equidistant from the two cleaning assemblies 20.

[0052] Referring to FIG. 6 again, in the embodiment of the present application, in the circumferential direction of the roller body 10, the distance from the support rib 11 to the cleaning assembly 20 may refer to the distance from the outer edge of the support rib 11 to the outer edge of the brush strip 21 in the same cross section of the roller brush 200. The point of the outer edge of the support rib 11 existing in the cross section of the roller brush 200 is defined as the fourth intersection point D. This distance may be the straight-line distance between the fourth intersection point D and the second intersection point B, or may be the length of an arc between a ray extending from the third intersection point C and passing through the fourth intersection point D and the other ray extending from the third intersection point C and passing through the second intersection point B, in a cross section. The center of this arc may be the third intersection point C, and at least one of the second and fourth intersection points B, D may be the end point of this arc.

[0053] That is to say, the cleaning assemblies 20 and the support ribs 11 are arranged at equal angle intervals in the circumferential direction of the roller body 10, and can each play the role of increasing the outer diameter of the roller body 10. The more uniform arrangement can further reduce the possibility that the hair is wound outside the roller body 10.

[0054] The distance R_1 from the outer edge of the brush strip 21 to the axis of roller body 10, the distance R_2 from the outer edge of one of the two support strips 22 to the axis of roller body 10, and the distance R_3 from the outer edge of the other of the two support strips 22 to the axis of roller body 10 satisfies the following relation:

R_1 is greater than R_2, and R_1 is greater than R_3.

[0055] As an example, R_2 may be equal to R_3.

[0056] The outer edge mentioned here refers to the edge far away from the axis of the roller body 10. For example, the outer edge of the brush strip 21 refers to the edge of the brush strip 21 far away from the axis of the roller body 10.

[0057] R_1 is greater than R_2, and R_1 is greater than R_3. That is to say, the outer edge of the brush strip 21 extends outwards beyond the outer edge of the support strip 22 in the radial direction of the roller body 10. As such, when the object such as the blanket to be cleaned is cleaned, the support strips 22 push away the tufted fluffs of the object to be cleaned, and the brush strip 21 can then more deeply sweep away the debris that hides in the deep of the tufted fluffs, and pick up the filament from the deep of the tufted fluffs.

[0058] In the embodiment of the present application, the cleaning assembly 20 is arranged on the side of the roller body 10, and includes the brush strip 21 and two support strips 22. The brush strip 21 and two support strips 22 each extend helically on the surface of the roller body 10, and the brush strip 21 is located between the two support strips 22. During cleaning, the brush strip 21 and the support strips 22 helically extending can drive the hair to move to the end of the brush strip, so that the hair is not easy to be wound in the middle of the roller brush 200. When cleaning the object such as carpet to be cleaned, one of the support strips 22 can contact the object to be cleaned prior to the brush strip 21, and push away the tufted fluffs on the surface of the object to be cleaned. Because the distance of the outer edge of the brush strip 21 to the axis of the roller body 10 is greater than the distance of the outer edge of the support strip 22 to the axis of the roller body 10, after the support strip 22 pushes away the tufted fluffs, the brush strip 21 can go deep between the tufted fluffs of the object surface to be cleaned, sweep out the debris that hides in the deep of tufted fluffs, and separate the filament that is entwined with tufted fluffs. After the brush strip 21 performs cleaning, the other support strip 22 contacts the surface of the object to be cleaned again, and sweep away the debris that the brush strip 21 picks up. In the cleaning process, the support strips 22 at both sides of the brush strip 21 can support the filament swept out, increasing the circumference of the roller brush 200 on which the filament is wound, and reducing the probability that the filament is wound more than one turn on the roller brush

200. Therefore, the filament is not easy to be wound on the roller brush 200 and does not affect the operation of the roller brush 200, which is conducive to improving the cleaning effect of the filament on the surface of the objects such as carpet.

[0059] In some examples, the difference between R_1 and R_2 is no more than 3 mm, and the difference between R_1 and R_3 is no more than 3 mm.

[0060] If the length of the outer edge of the brush strip 21 extending beyond the outer edge length of the support strip 22 is too long, as the roller brush 200 rolls, it is unfavorable for the brush strip 21 to go deep into the tufted fluffs to clean up debris.

[0061] Exemplarily, the difference between R_1 and R_2 is 1 mm.

[0062] In the above-mentioned embodiment, by making the difference between R_1 and R_2 not more than 3 mm, the brush strip 21 can better clean up the debris deep in the tufted fluffs in the process of rolling the roller brush 200.

[0063] In some examples, the distance between the outer edge of at least one of the two support strips 22 and the outer edge of the brush strip 21 is not more than 15 mm, for example, 2 mm.

[0064] During cleaning, the filaments such as hairs hidden in tufted fluffs are easily entangled on the brush strip 21 or stuck on the brush strip 21, thereby being brought out from the deep of the tufted fluffs by the brush strip 21 and separated from the tufted fluffs. The support strip 22 can support the filament that the brush strip 21 brings out, reducing the probability that the filament is wound more than one turn on the roller brush 200, thereby reducing the possibility that the filament is wound on the roller brush 200.

[0065] When the brush strip 21 comes into contact with the filament, the filament is usually wound or stuck at the outer edge of the brush strip 21. If the distance between the outer edge of brush strip 21 and the outer edge of support strip 22 is too large, before the filament is supported by the support strip 22, as the roller brush 200 rolls, the part of the filament wrapped around or stuck on the brush strip 21 slides along the brush strip 21 towards the roller body 10, making the filament and the brush strip 21 wrapped or stuck more tightly, and resulting in the difficulty of separating the filament from the brush strip 21 and of inhaling the filament through the suction port 100b. As a result, the filament remains on the roller brush 200. In the embodiment of the present application, the distance between the outer edge of the brush strip 21 and the outer edge of the support strip 22 is relative small, so that the filament can be supported by the support strip 22 after the brush strip 21 brings the filament out a small length from the deep of the tufted fluffs, avoiding the part of the filament entangled or stuck on the brush strip 21 from sliding along the brush strip 21 towards the roller body 10, and separating the filament from the brush strip 21 easily.

[0066] Exemplarily, the distance between the outer edge of the support strip 22 and the outer edge of the brush strip 21 may be 2 mm.

[0067] In some examples, the outer edge of the support strip 22 may be in contact with the brush strip 21.

[0068] Exemplarily, the outer edge of the support strip 22 located in front of the brush strip 21 may be in contact with the brush strip 21.

[0069] During operation of cleaning device, the roller brush 200 is usually rotated in a single direction, and the support strip 22 located in front of the brush strip 21 as stated above refers to one of the two support strips 22 located in front of the brush strip 21 in the direction of rotation of the roller brush 200 in the cross section of the roller brush 200, and the other support strip 22 is the one that is located behind the brush strip 21.

[0070] FIG. 8 is a schematic structural view of a support strip provided in an embodiment of the present application. As shown in FIG. 8, the cross section of the support strip 22 may be T-shaped. The support strip 22 includes a first mounting portion 221 and a support portion 222. The first mounting portion 221 is strip-shaped, and the support portion 222 is connected to one side of the first mounting portion 221.

[0071] FIG. 9 is a schematic partial structural view of a support strip provided in an embodiment of the present application. As shown in FIG. 9, the junction of the support portion 222 and the first mounting portion 221 has a second fillet corner 223, and the first mounting portion 221 is connected to the roller body 10.

[0072] The first mounting portion 221 functions to connect the roller body 10, and the support portion 222 functions to support filament. During operation of the cleaning device, the support portion 222 contacts object to be cleaned and will be laterally deformed. Therefore, stress is generated at the junction of the support portion 222 and the first mounting portion 221. By providing the second fillet corner 223 at the junction of the support portion 222 and the first mounting portion 221, the stress at the junction can be reduced, so that the service life of the support strip 22 can be prolonged.

[0073] In some optional embodiments, the radius of the second fillet corner 223 is greater than a second radius threshold. For example, the second radius threshold may be 3 mm.

[0074] In the embodiment, by making the radius of the second fillet corner 223 greater than the second radius threshold, the stress at the junction can be further reduced, reducing the wear of the support strip 22 caused by contact between the roller body 10 and the support strip 22, and thus improving the anti-tearing ability of the support strip 22.

[0075] Exemplarily, the support strip 22 may be a rubber strip, a silicone strip, etc. The support strip 22 may have a hardness ranging from 20 to 60HS. For example, the hardness of the support strip 22 may be 30 HS.

[0076] FIG. 10 is a schematic sectional view of a roller body provided in an embodiment of the present application. As shown in FIG. 10, the surface of the roller body 10 is provided with a first T-shaped groove 10a. The first T-shaped groove 10a is provided with a first fillet corner 10b at its opening, and the first mounting portion 221 is located in the first T-shaped

groove 10a.

[0077] The first T-shaped groove 10a is engaged with the first mounting portion 221 to prevent the support strip 22 from detaching from the roller body 10. The support portion 222 may come into contact with both sides of the first T-shaped groove 10a when it is laterally deformed. The first fillet corner10b is provided on each side of the opening of the first T-shaped groove 10a, so that the stress that the support portion 222 is subjected to when it is in contact with both sides of the opening can be reduced, and the service life of the support strip 22 can be prolonged.

[0078] In some optional embodiments, the radius of the first fillet corner10b is greater than a first radius threshold. The first radius threshold may be equal to the second radius threshold, or it may be greater or less than the second radius threshold. For example, the first radius threshold may be 3 mm.

[0079] In the embodiment, by making the radius of the first fillet corner10b greater than the first radius threshold, the stress at the junction can be further reduced, thereby reducing the wear of the support strip 22 caused from the opening of the first T-shaped groove 10a, and thus improving the anti-tearing ability of the support strip 22.

[0080] In this example, the part of the first T-shaped groove 10a corresponding to the second fillet corner 223 may have the third fillet corner10c, thereby further reducing the stress that the support strip 22 is subjected to, and prolonging the service life of the support strip 22.

[0081] As shown in FIG. 8, the first mounting portion 221 includes a first section 2211 and a second section 2212 that are connected. The first section 2211 is close to the first end of the roller body 10, and has the thickness less than the thickness of the second section 2212.

[0082] The thickness of the first mounting portion 221 refers to the distance between one side of the first mounting portion 221 close to the support portion 222 and the other side of the first mounting portion 221 away from the support portion 222.

[0083] The thickness of the second section 2212 is larger, so that the gap between the second section 2212 and the first T-shaped groove 10a is smaller. The smaller gap makes the support strip 22 and the roller body 10 relatively stable, and the support strip 22 is avoided to loosen. The thickness of the first section 2211 is smaller, so that the gap between the first section 2211 and the first T-shaped groove 10a is larger. A part of the first end of the support strip 22 close to the roller body 10 can float, thereby reducing the radial pressure of the first section 2211 of the support strip 22 applied to the roller body 10.

[0084] The first end of the roller body 10 is configured to be in transmission connection with the transmission mechanism 500, that is, the first end of the roller body 10 is the end where power is inputted. If a relatively large radial pressure is exerted on the first end of the roller body 10, the stability of rotation of the roller body 10 may be affected. In this example, the thickness of the first section 2211 of the support strip 22 is thinner, and the radial pressure exerted on the roller body 10 is smaller, which is conducive to improving the stability of the rotation of the roller body 10.

[0085] The length of the second section 2212 may be greater than the length of the first section 2211, so that most of the first mounting portion 221 can be stably engaged with the first T-shaped groove 10a, improving the stability of installation of the support strip 22.

[0086] The first mounting portion 221 may further include a stop block 225 provided at the end of the second section 2212 away from the first section 2211, and the stop block 225 is at least partially positioned outside the first T-shaped groove 10a. the stop block 225 cooperates with the roller body 10 to prevent the first mounting portion 221 from sliding along the first T-shaped groove 10a.

[0087] As shown in FIG. 9, at least one side of the support portion 222 is covered with flexible cloth 224, and the edge of the flexible cloth 224 away from the first mounting portion 221 extends beyond the edge of the support portion 222 away from the first mounting portion 221.

[0088] In this example, the flexible cloth 224 covers one side of the support portion 222 and a part of the surface of the first mounting portion 221. For example, the support strip 22 located in front of the brush strip 21 is covered with flexible cloth 224 on its side far away from the brush strip 21, and the support strip 22 located at the rear of the brush strip 21 is covered with flexible cloth 224 on its side close to the brush strip 21.

[0089] The flexible cloth 224 covers at least one side of the support portion 222, which can provide protection to the support strip 22 and reduce the wear of the support portion 222.

[0090] As an example, the edge of the flexible cloth 224 away from the first mounting portion 221 extends beyond the edge of the support portion 222 away from the first mounting portion 221 by a width less than or equal to 1 mm.

[0091] The edge of the support portion 222 away from the first mounting portion 221 has the function of sweeping debris and pushing away the tufted fluffs on the surface of the carpet or the like, and is relatively easy to wear. By extending the edge of the flexible cloth 224 slightly beyond the edge of the support portion 222, it is possible to improve the protective effect on the edge of the support portion 222, and reduce the wear of the edge of the support portion 222.

[0092] Exemplarily, the thickness of flexible cloth 224 may be ranged from 0.3 mm to 0.4 mm. The flexible cloth 224 may be nylon cloth or polyester cloth.

[0093] FIG. 11 is a schematic sectional view of a brush strip provided in an embodiment of the present application. As shown in FIG. 11, the cross section of this brush strip 21 may also be T-shaped. The brush strip 21 may include a second mounting portion 211 and bristles 212, and the bristles 212 may be distributed on one side of the second mounting portion

211. The distance, softness and diameter of the bristles 212 may be selected according to the different cleaning effects. Exemplarily, the diameter of the bristle 212 may be 0.2 mm. The brush strip 21 may include the same kind of bristles 212, or may include various kinds of bristles 212. The same kind of bristles 212 refer to the bristles 212 made of the same fibers, and the different kinds of bristles 212 are made of different fibers. The same fibers may refer to the fibers having the same material and/or the same diameter. The different bristles 212 may refer to the bristles having different materials and/or different diameters.

[0094] The outer side wall of the roller body 10 may also be provided with a second T-shaped groove 10d, and the brush strip 21 is connected to the roller body 10 through the second T-shaped groove 10d. The second mounting portion 211 may be located in the second T-shaped groove 10d, with the bristles 212 extending out of the second T-shaped groove 10d.

[0095] As shown in FIG. 5, the roller brush 200 further includes a first end cover 31 and a second end cover 32. The first end cover 31 is connected to the first end of the roller body 10, and the second end cover 32 is connected to the second end of the roller body 10.

[0096] The first end cover 31 and the second end cover 32 may be detachably connected to the roller body 10. For example, they may be connected through snap-fit.

[0097] In the same cleaning assembly 20, one end of at least one support strip 22 is inserted between the first end cover 31 and the roller body 10, and the first end cover 31 is configured to make the part of the support strip 22 located between the first end cover 31 and the roller body 10 bent towards the roller body 10.

[0098] In this example, after the support portion 222 of the support strip 22 is bent under the action of the first end cover 31, the height of the support strip 22 protruding from the roller body 10 at the first end of the roller body 10 is reduced, which is conducive to avoiding impact of the comb teeth on the support strip 22 as well as the pulling of the object to be cleaned on the support strip 22 during operation. The radial force of the support strip 22 applied to the first end of the roller body 10 is reduced, which is conducive to improving the stability of the rotation of the roller body 10, providing protection to the end of support strip 22, and reducing the wear of the end of the support strip 22.

[0099] Exemplarily, the length of the part of the support strip 22 located between the first end cover 31 and the roller body 10 is larger than and equal to 5 mm.

[0100] In the above-mentioned embodiment, by making the length of the part of the support strip 22 located between the first end cover 31 and the roller body 10 not less than 5mm, the stability of the insertion connection between the support strip 22 and the first end cover 31 can be increased, so as to ensure that the support strip 22 will not come out from the first end cover 31.

[0101] FIG. 12 is a schematic structural view of a first end cover provided in an embodiment of the present application. As shown in FIG. 12, the first end cover 31 includes a mounting disc 311, and a first limiting plate 312 connected to one side of the mounting disc 311. In conjunction with FIG. 5, the mounting disc 311 faces the end face of the roller body 10, and there is a gap between the first limiting plate 312 and the outer side wall of the roller body 10. At least one support strip 22 is located in this gap and abuts against the inner side wall of the first limiting plate 312.

[0102] In this example, the support strip 22 positioned in front of the brush strip 21 is located in the gap between the first limiting plate 312 and the outer side wall of the roller body 10.

[0103] By inserting the end of the support strip 22 into the gap between the first limiting plate 312 and the outer side wall of the roller body 10, the support strip 22 is bent towards the roller body 10 to have reduced height protruding from the roller body 10. The above-mentioned embodiments have at least the following advantages: 1. reducing the height of the support strip 22 protruding from the roller body 10 at this position can avoid the impact of the comb teeth and the pulling of the object to be cleaned, and thus can protect the end of the support strip 22, and reduce the wear of the end of the support strip 22; 2. Abutting the surface of the support strip 22 against the inner side wall of the first limiting plate 312 can ensure that the support strip 22 will not be worn out rapidly by the edge of the first limiting plate 312, and thus ensure the service life of the roller brush 200.

[0104] As shown in FIG. 12, the first limiting plate 312 further has a first notch 312a in which at least a part of the brush strip 21 is located. The first notch 312a is configured to keep clear of the end of the brush strip 21.

[0105] The first end cover 31 further includes a plurality of second limiting plates 313. The second limiting plate 313 and the first limiting plate 312 are connected on the same side of mounting disc 311. The plurality of second limiting plates 313 are distributed along the edge of the mounting disc 311 and spaced from each other. The second limiting plates 313 are in transition fit with the outer side wall of the roller body 10, and the first limiting plate 312 is positioned between adjacent second limiting plates 313.

[0106] The second limiting plate 313 is configured to match with the roller body 10, so that the first end cover 31 and the roller body 10 can be stably installed together. The second limiting plate 313 and the outer sidewall of the roller body 10 are in transition fit. That is, the second limiting plates 313 and the roller body 10 may be in interference fit, or may be in clearance fit. Adopting the interference fit can increase stability, assembling the first end cover 31 and the roller body 10 more firmly, and reducing debris such as hair stuck between the second limiting plates 313 and the roller body 10. Adopting the clearance fit can facilitate the disassembling and assembling of the first end cover 31 and the roller body 10, facilitating the replacement of the roller body 10, the support strip 22 or the brush strip 21.

[0107] Exemplarily, the minimum clearance between the second limiting plate 313 and the outer side wall of the roller body 10 is less than or equal to 0.2 mm.

[0108] The fibrous debris such as hair stuck in the clearance between the second limiting plate 313 and the outer side wall of the roller body 10 are difficult to clean, and may be stuck inside the roller brush 200 to result in adverse effects on the movement of some moving parts such as bearings. Although the diameter of the hairs is small, the hairs naturally wound around the roller brush 200 are usually curved or curled, not taut. These naturally wound hairs are usually difficult to pass through the clearance larger than the hair diameter. This clearance is set not more than 0.2 mm to effectively prevent the hairs from being stuck between the second limiting plates 313 and the outer side wall of the roller body 10, avoiding excessive assembly precision to increase manufacturing cost and assembly difficulty.

[0109] The clearance between the second limiting plate 313 and the outer side wall of the roller body 10 is set relatively small, so as to avoid debris such as hair from jamming in.

[0110] The edge of the second limiting plate 313 has a second notch 313a in which the end of the support rib 11 is located.

[0111] As shown in FIG. 12, a transition plate 314 is connected between the first limiting plate 312 and the second limiting plate 313, and is smoothly connected with the first limiting plate 312 and the second limiting plate 313. Connecting the first limiting plate 312 and the second limiting plate 313 by the transition plate 314 can improve the respective structural strengths, and reduce deformations.

[0112] In some examples, in the same cleaning assembly 20, at least part of one support strip 22 is located in the first notch 312a.

[0113] In this example, the first limiting plate 312 has a first notch 312a, and the brush strip 21 and the support strip 22 positioned at the rear of the brush strip 21 are positioned in the first notch 312a.

[0114] Reference is made to the example shown in FIG. 5. In this example, at least a part of the brush strip 21 is positioned in the first notch 312a of the first limiting plate 312, and at least a part of the support strip 22 positioned in front of the brush strip 21 is positioned between the first limiting plate 312 and the outer side wall of the roller body 10, and is bent towards the brush strip 21.

[0115] The support strip 22 located in front of the brush strip 21 is bent towards the brush strip 21 by the first limiting plate 312 to reduce the height of the support strip 22 protruding from the outer surface of the roller body 10 near the first end cover 31, to reduce the wear between the support strip 22 and the ground near the end of the roller body 10, and to avoid impact of the comb strip 300 on the support strip 22, thereby prolonging the service life of the support strip 22. At least a part of the other support strip 22 is arranged in the first notch 312a near the end of the roller body 10. After the brush strip 21 completes cleaning, the support strip 22 located in the first notch 312a can be in contact with the surface of the object to be cleaned to sweep away the debris that brush strip 21 takes out, which is suitable for the situation where the cleaning effect is more important.

[0116] In some other possible embodiments, in the same cleaning assembly 20, the two support strips 22 are at least partially located between the first end cover 31 and the roller body 10. The part of one support strip 22 located between the first end cover 31 and the roller body 10 is bent towards the brush strip 21, and the part of the other support strip 22 located between the first end cover 31 and the roller body 10 is bent away from the brush strip 21.

[0117] FIG. 13 is a schematic view showing assembling of a first end cover provided in an embodiment of the present application. As shown in FIG. 13, in this example, the brush strip 21 is positioned in the first notch 312a of the first limiting plate 312, and the support strips 22 respectively located before and after the brush strip 21 are both positioned between the first limiting plate 312 and the outer side wall of the roller body 10. The part, located between the first limiting plate 312 and the outer side wall of the roller body 10, of the support strip 22 located before the brush strip 21 is bent towards the brush strip 21, and the part, located between the first limiting plate 312 and the outer side wall of the roller body 10, of the support strip 22 located behind the brush strip 21 is bent away from the brush strip 21.

[0118] The two support strips 22 are bent by the first limiting plate 312 at the first end of the roller body 10 to reduce the height of the two support strips 22 there protruding from the roller body 10, which is conducive to further improving the stability of rotation of the roller body 10, and reducing the wear of the ends of the two support strips 22. Thus, it is suitable for the occasion that pays more attention to prolonging the service life of the roller brush.

[0119] As shown in FIG. 13, the outer side wall of the second limiting plate 313 is inclined. The outer side wall of the second limiting plate 313 is inclined towards the roller body 10 as it extends away from the mounting disc 311.

[0120] During the operation of the cleaning device, the first end of the roller body 10 is more likely to be wrapped with filaments such as hair than other parts of the roller body 10. In this example, the outer side wall of the second limiting plate 313 is inclined to have a slope which may guide the filaments such as hairs wound on the roller brush 200 and the first end cover 31 to gather at the lowest part of the slope, thereby facilitating centralized processing by using a comb strip 300.

[0121] FIG. 14 is a schematic structural view of a second end cover provided in an embodiment of the present application. As shown in FIG. 14, the second end cover 32 may be provided with a plurality of gap covering ribs 321 at the side close to the roller body 10. The plurality of gap covering ribs 321 are circumferentially distributed, and may be in transition fit with the outer side wall of the roller body 10.

[0122] FIG. 15 is a schematic partial structural view of a roller brush provided in an embodiment of the present

application. As shown in FIG. 15, the gap covering ribs 321 may be matched with the outer side wall of the roller body 10, and may be in transition fit with the outer side wall of the roller body 10. For example, the gap covering ribs 321 may contact the outer side wall of the roller body 10. The gap covering rib 321 is configured to cover the gap between the roller body 10 and the second end cover 32, so as to prevent hair from jamming in.

[0123] FIG. 16 is a schematic partial structural view of a cleaning device provided in an embodiment of the present application. As shown in FIG. 16, the comb strip 300 includes a plurality of first comb teeth 301 and a plurality of second comb teeth 302, which are distributed at intervals in the direction parallel to the axis of the roller body 10. The first comb tooth 301 is positioned at the first end of the roller body 10, and has the length greater than the length of the second comb tooth 302.

[0124] The comb strip 300 is configured to cooperate with the cleaning assembly 20 to clean debris from the cleaning assembly 20 so that the debris is separated from the cleaning assembly 20. In the present example, the inclined outer side wall of the second limiting plate 313 plays the role of collecting filaments such as hairs, and the first comb teeth 301 with a long length are provided so that the first comb teeth 301 can clear the hairs that collect there. As the roller brush 200 rotates, the first comb teeth 301 contact and pull the gathered hair to make hair break, so as to separate the hair from the roller brush 200 and finally draw the hair in through the suction port 100b. Therefore, it can avoid hair from excessive winding on the roller brush 200. When some of hairs are difficult to be completely separated from the first end cover 31, the first end cover 31 and the roller body 10 may be removed to clean up the hairs.

[0125] During rotation of the roller brush 200, the second comb teeth 302 and the support strips 22 strike each other to separate the debris attached to the support strips 22. In this example, magnitude of interference between the comb strip 300 and the support strip 22 is in a range of 1 mm to 3.5 mm, for example, may be 2.5 mm.

[0126] The magnitude of the interference between the comb strip 300 and the support strip 22 refers to the length of the part of the comb strip 300 in contact with the support strip 22 during rotation of the roller brush 200. That is, the tip of the comb strip 300 has a length of 1 mm to 3.5 mm which can contact the support strip 22.

[0127] The support strip 22 may shake after being hit by the comb strip 300, thereby resulting in noise. In this example, only a small part of the second comb teeth 302 hits the support strip 22, so that a small area of the support strip 22 is hit while ensuring the effect of preventing hair from winding, thereby reducing shaking of the support strip 22 and facilitating reduction of noise when the cleaning device is operated.

[0128] Furthermore, because the distance between the outer edge of the brush strip 21 and the outer edge of the support strip 22 is small, not more than 15 mm, the support strip 22 may contact the bristles 212 of the brush strip 21 when the support strip 22 shakes. The bristles 212 may absorb a part of the energy of the support strip 22 so as to slow down the vibration of the support strip 22, and the support strip 22 may be quickly restored to its original state, which is conducive to the elimination of noise.

[0129] The magnitude of interference between the comb strip 300 and the brush strip 21 may be ranged from 1 mm to 6 mm, for example, 3.5 mm. The interaction between the comb strip 300 and the brush strip 21 can clean up the debris that is stuck on the brush strip 21, improving the cleaning efficiency.

[0130] When the cleaning device is in use, the opening of the roller brush mounting groove 100a faces the object to be cleaned, for example, a carpet laid on the floor. As shown in FIG. 3, the comb strip 300 may be located between the roller brush 200 and the suction port 100b, and the distance from the comb strip 300 to the opening of the roller brush mounting groove 100a is greater than the distance from the axis of the roller body 10 to the opening of the roller brush mounting groove 100a. That is, the comb strip 300 is arranged at the height above the axis of the roller body 10.

[0131] In some examples, the height of the part of the support strip 22 protruding from the opening of the roller brush mounting groove 100a is less than or equal to 0.5 mm. That is, in use, the magnitude of the interference between the support strip 22 and the floor is less than or equal to 0.5 mm, for example, 0.1 mm. This can avoid the excessive deformation of the support strip 22 and thus avoid excessive radial force of the support strip 22 applied to the roller body 10. The height of the part of the brush strip 21 protruding from the opening of the roller brush mounting groove 100a is less than or equal to 3 mm, for example, 1 mm. This can avoid the bristles 212 of the brush strip 21 from being bent too much to affect the service life.

[0132] In some examples, the rotational speed of the roller brush 200 in the cleaning device may be less than or equal to 2000 rpm when being operated. In related technology, in order to achieve the cleaning effect, the rotational speed of the roller brush is usually larger than 2400 rpm when being operated, resulting in large noise and short service life of the roller brush. In this example, because the roller brush 200 has a relatively high cleaning efficiency, the rotational speed of the roller brush 200 may be reduced to reduce the noise of the cleaning device in use while ensuring the cleaning effect, and to increase the life of the support strip 22 and thus the service life of the roller brush 200.

[0133] The above embodiments are only used to illustrate the technical solutions of the present application and are not intended to limit it. Although the present application is described in detail with reference to the foregoing embodiments, a person of ordinary skill in the art should understand that he/she can still modify the technical solutions described in the foregoing embodiments, or make equivalent substitutions for some of the technical features therein. And, such modifications or substitutions do not make the essence of the corresponding technical solutions depart from the spirit and scope of

the technical solutions of the embodiments of the present application, and should be included in the scope of protection of the present application.

Claims

1. A roller brush, applied to a cleaning device and comprising a roller body (10) and a plurality of cleaning assemblies (20), wherein

   the plurality of cleaning assemblies (20) are provided on an outer surface of the roller body (10) along an axial direction of the roller body (10), and are spaced from each other in a circumferential direction of the roller body (10);
   each of the cleaning assemblies (20) comprises a brush strip (21) and two support strips (22), which all extend helically from a first end of the roller body (10) to a second end of the roller body (10), with the brush strip (21) being located between the two support strips (22); and
   a distance between the two support strips (22) of the same cleaning assembly (20) in the circumferential direction of the roller body (10) is less than a distance between two adjacent cleaning assemblies (20) in the circumferential direction of the roller body (10).

2. The roller brush according to claim 1, wherein a distance R_1 from an outer edge of the brush strip (21) to an axis of roller body (10), a distance R_2 from an outer edge of one of the two support strips (22) to the axis of roller body (10), and a distance R_3 from an outer edge of the other of the two support strips (22) to the axis of roller body (10) satisfies the following relation:
   R_1 is greater than R_2, and R_1 is greater than R_3.

3. The roller brush according to claim 2, wherein a difference between R_1 and R_2 is less than or equal to 3 mm, and a difference between R_1 and R_3 is less than or equal to 3 mm.

4. The roller brush according to any one of claims 1 to 3, wherein the roller brush comprises two cleaning assemblies (20), two support ribs (11) are provided on a surface of the roller body (10) and extend helically along the axial direction of the roller body (10), and the two support ribs (11) and the two cleaning assemblies (20) are alternately arranged in the circumferential direction of the roller body (10).

5. The roller brush according to claim 4, wherein the two cleaning assemblies (20) are arranged symmetrically about a center of the roller body (10), the two support ribs (11) are arranged symmetrically about the center of the roller body (10), and any of the two support ribs (11) is equidistant from the two cleaning assemblies (20) in the circumferential direction of the roller body (10).

6. The roller brush according to any one of claims 1 to 3, wherein a first T-shaped groove (10a) is provided on a surface of the roller body (10) and has a first fillet corner (10b) at its opening, the first fillet corner (10b) has a radius larger than a first radius threshold; and
   each of the support strips (22) comprises a first mounting portion (221) and a support portion (222), the first mounting portion (221) is in a shape of strip, the support portion (222) is connected to a side of the first mounting portion (221), a second fillet corner (223) is provided at junction of the support portion (222) and the first mounting portion (221) and has a radius larger than a second radius threshold, and the first mounting portion (221) is located in the first T-shaped groove (10a).

7. The roller brush any one of claims 1 to 3, further comprising a first end cover (31) detachably connected to the first end of the roller body (10), wherein
   in the same cleaning assembly (20), at least one support strip (22) has an end inserted between the first end cover (31) and the roller body (10), the first end cover (31) is configured to enable the part of the support strip (22) located between the first end cover (31) and the roller body (10) to be bent towards the roller body (10).

8. The roller brush according to claim 7, wherein the first end cover (31) comprises a mounting disc (311) and a first limiting plate (312) connected to a side of the mounting disc (311), the mounting disc (311) is arranged to face an end face of the roller body (10), there is a clearance between the first limiting plate (312) and an outer side wall of the roller body (10), and at least one support strip (22) is located in the clearance and abuts against an inner side wall of the first limiting plate (312).

9. The roller brush according to claim 8, wherein the first limiting plate (312) is provided with a first notch (312a), and at least a part of the brush strip (21) is located in the first notch (312a).

10. The roller brush according to claim 9, wherein, in the same cleaning assembly (20), at least a part of one of the support strips (22) is located in the first notch (312a); or
in the same cleaning assembly (20), the two support strips (22) are at least partially located between the first end cover (31) and the roller body (10), the part of one of the support strips (22) located between the first end cover (31) and the roller body (10) is bent towards the brush strip (21), and the part of the other of the support strips (22) located between the first end cover (31) and the roller body (10) is bent away from the brush strip (21).

11. The roller brush according to claim 8, wherein the first end cover (31) further comprises a plurality of second limiting plates (313) connected to the same side of the mounting disc (311) as the first limiting plate (312), the plurality of second limiting plates (313) are arranged along an edge of the mounting disc (311) and spaced from each other, the second limiting plates (313) are in transition fit with the outer side wall of the roller body (10), and the first limiting plate (312) is located between two adjacent second limiting plates (313).

12. The roller brush according to claim 11, wherein a minimum clearance between the second limiting plates (313) and the outer side wall of the roller body (10) is less than or equal to 0.2 mm.

13. A cleaning device, comprising a body (100) and the roller brush (200) according to any one of claims 1 to 12, wherein the body (100) is provided with a roller brush mounting groove (100a), and the roller brush (200) is located in the roller brush mounting groove (100a) and rotatably connected to the body (100).

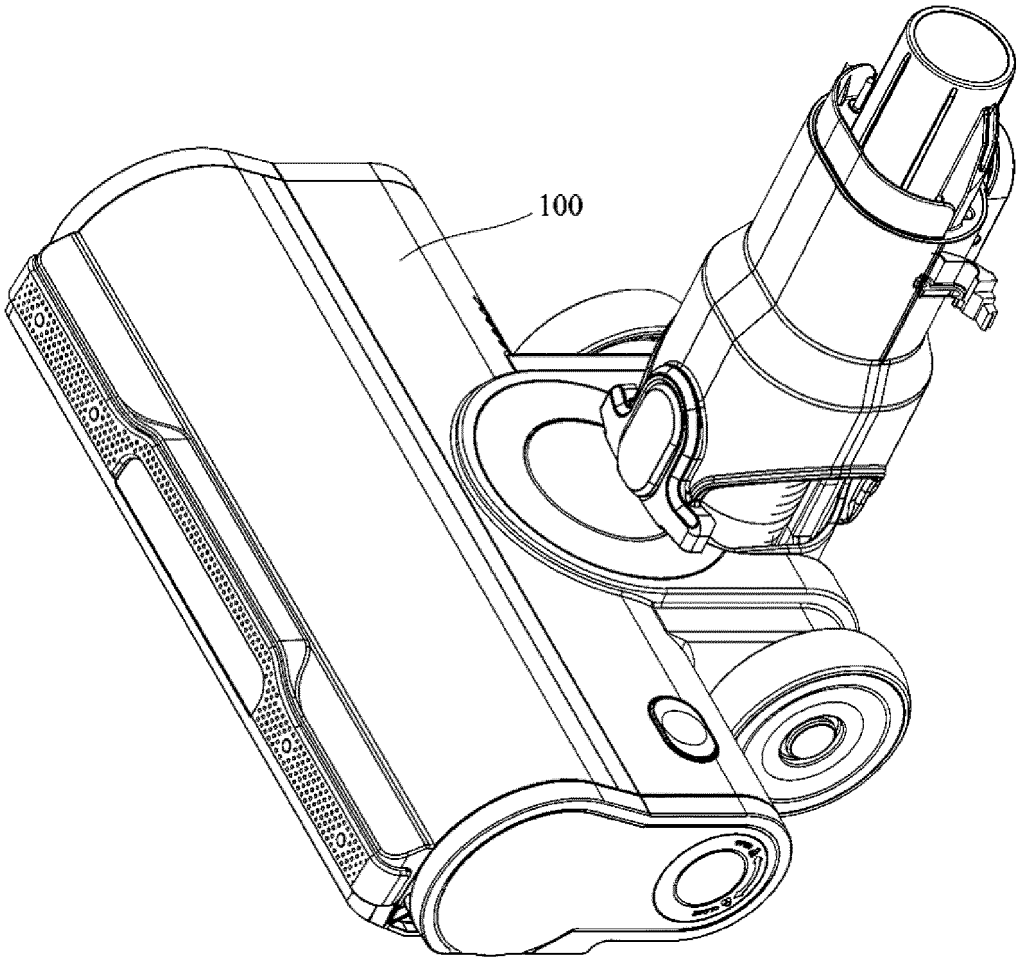

FIG. 1

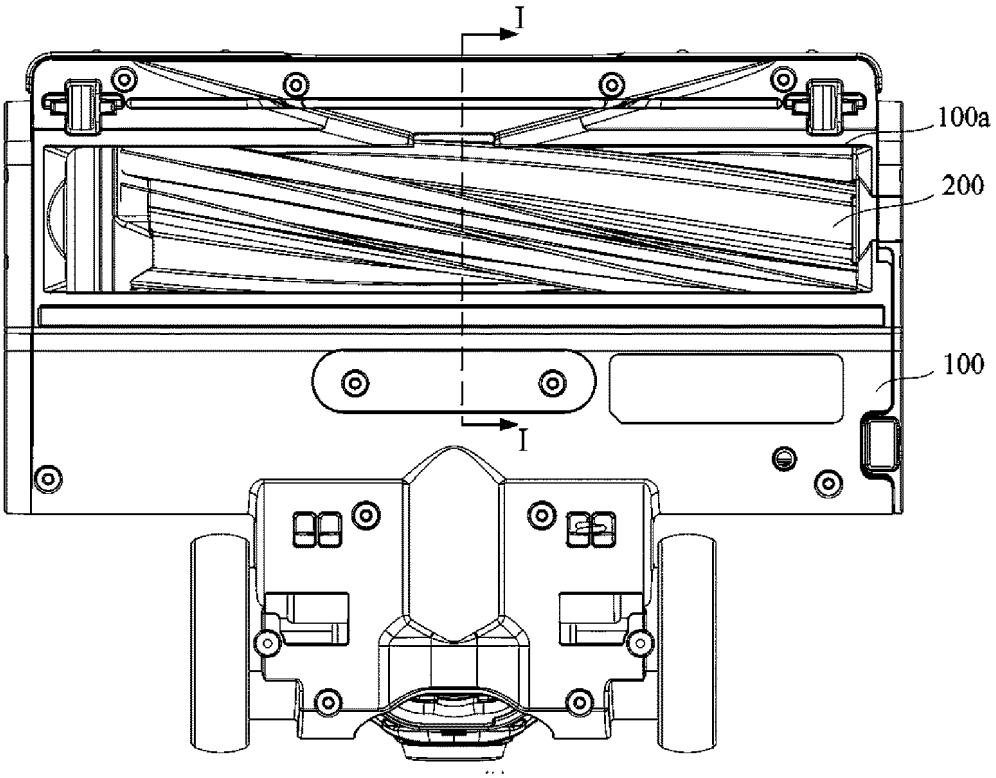

FIG. 2

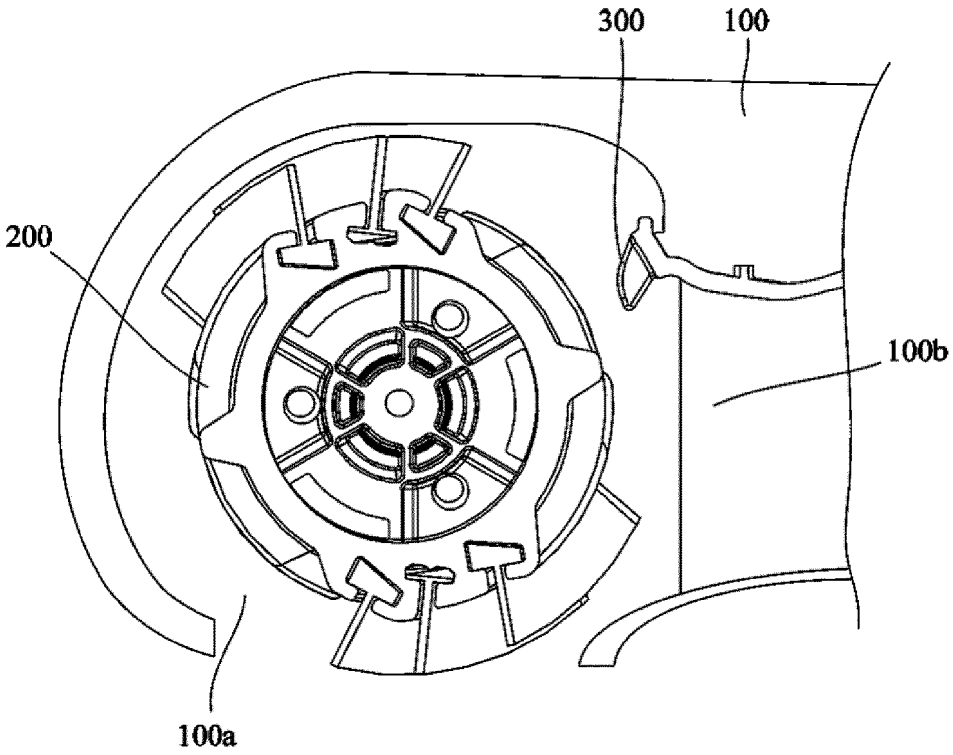

FIG. 3

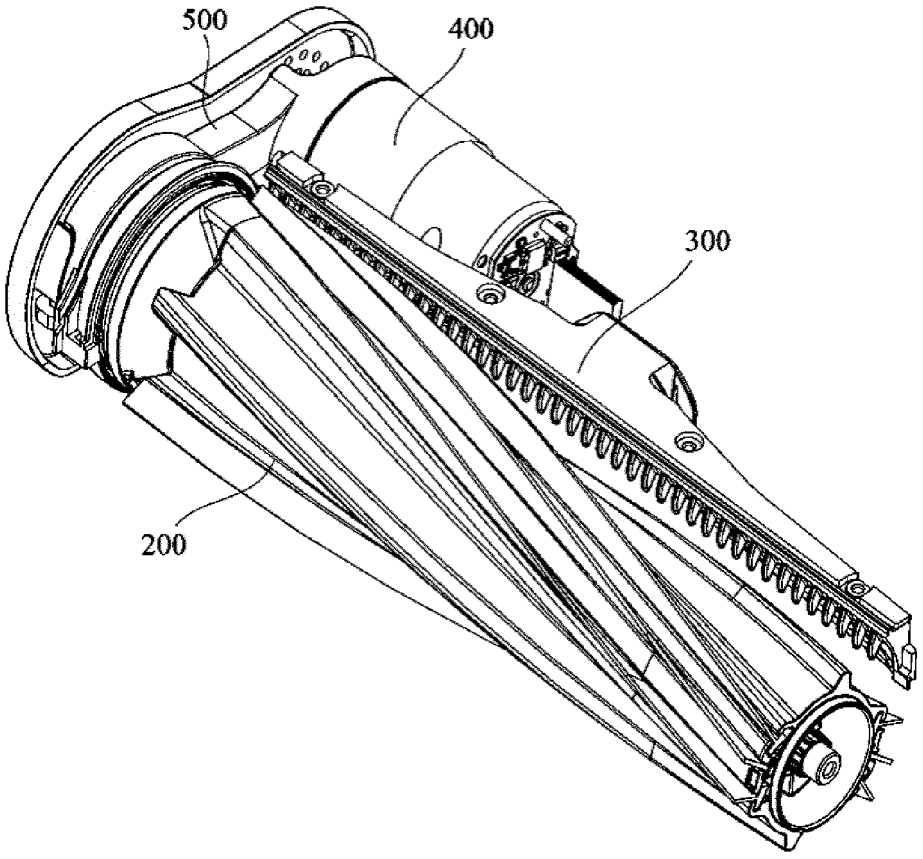

FIG. 4

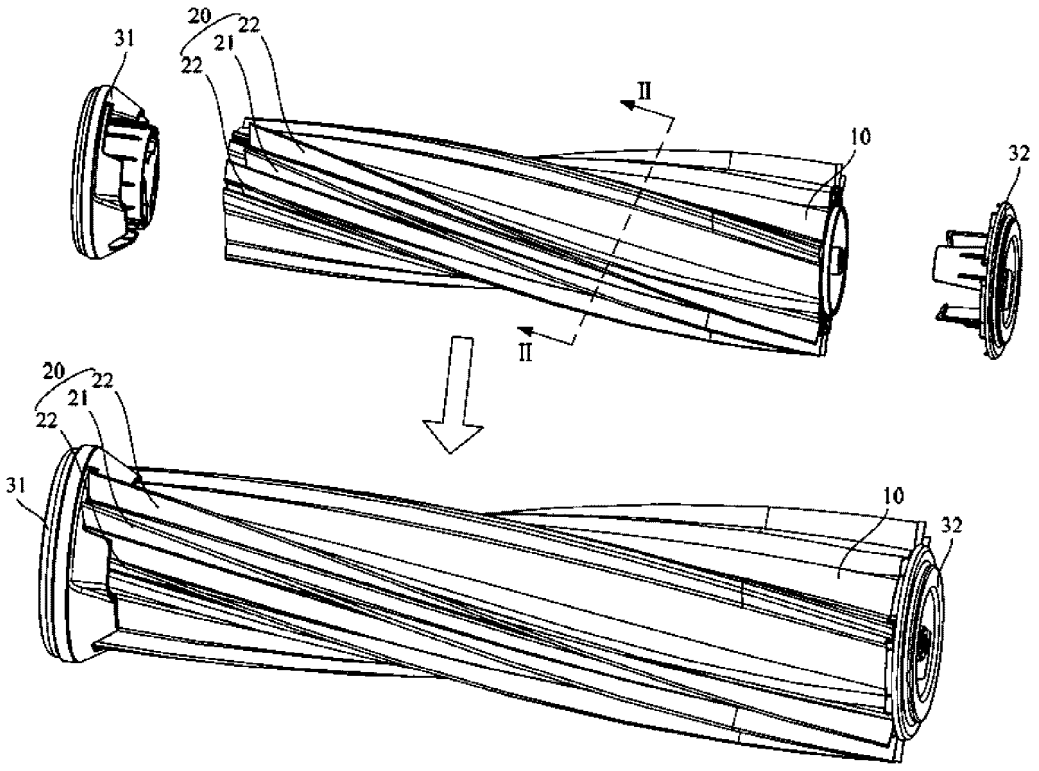

FIG. 5

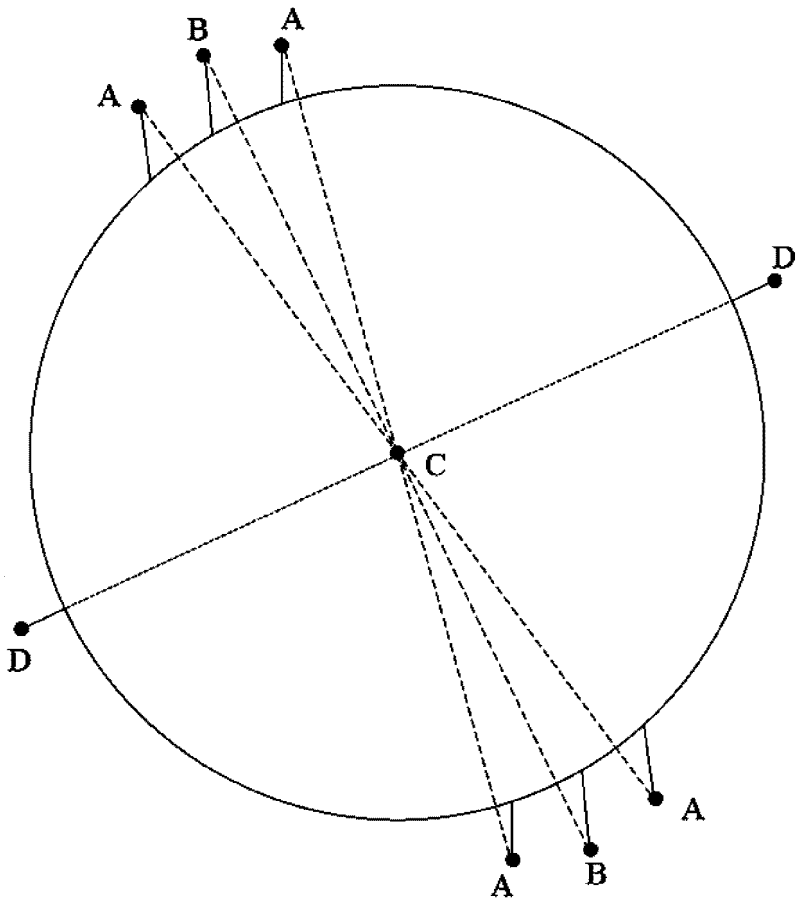

FIG. 6

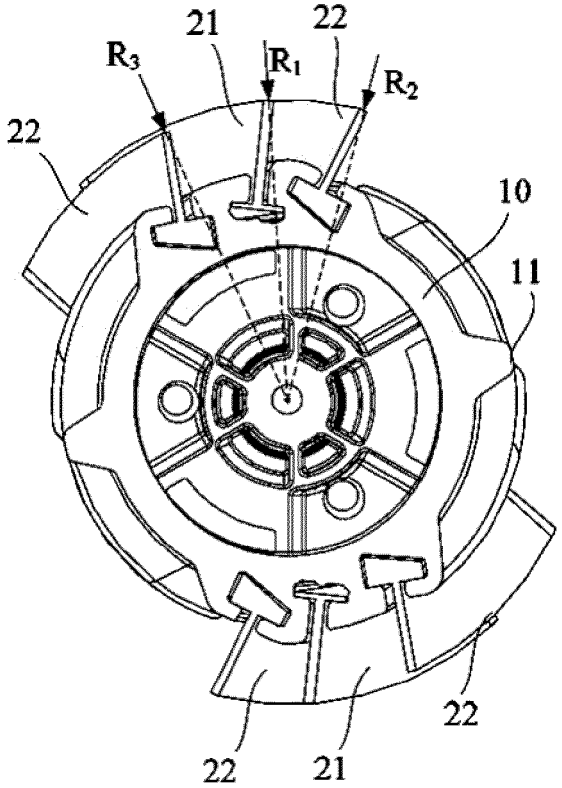

FIG. 7

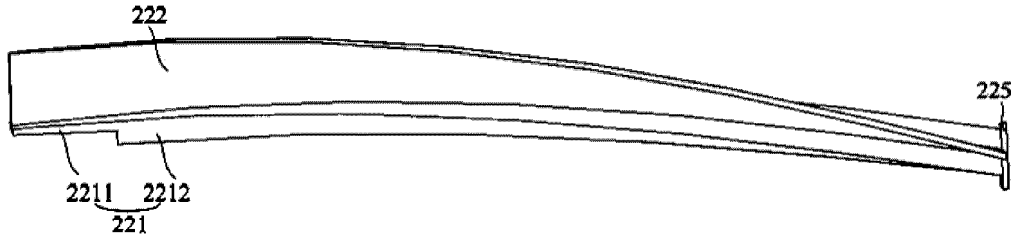

FIG. 8

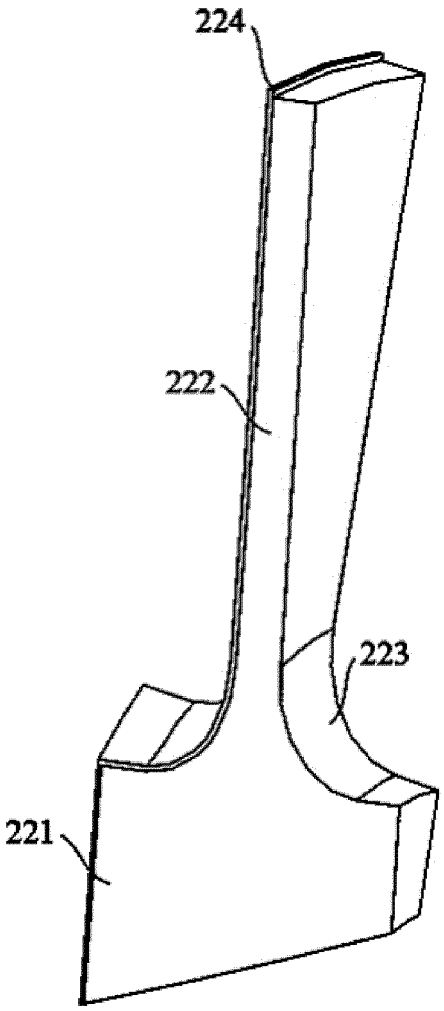

FIG. 9

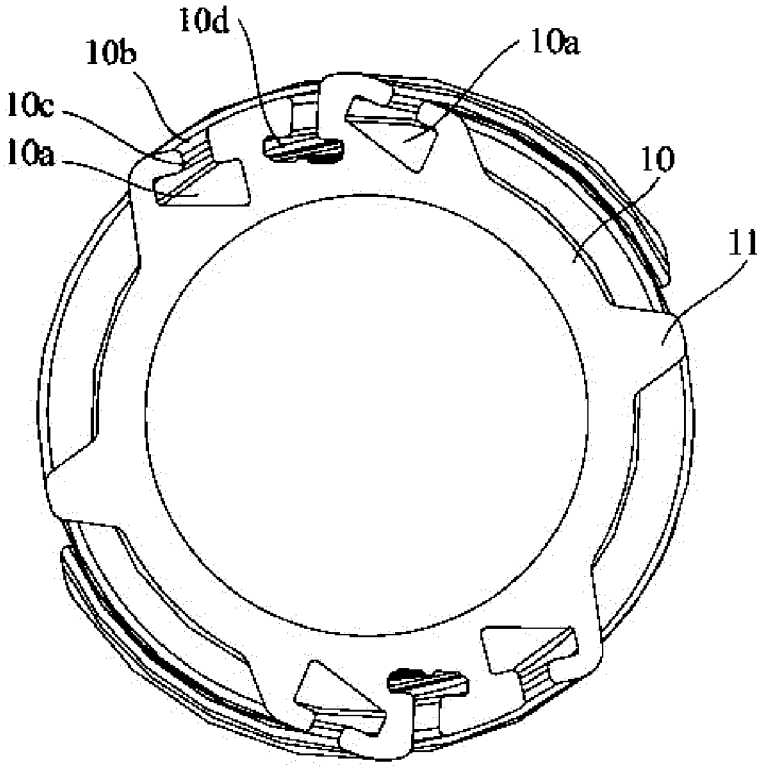

FIG. 10

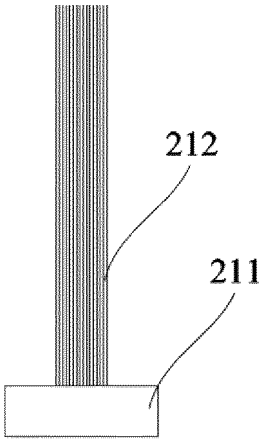

FIG. 11

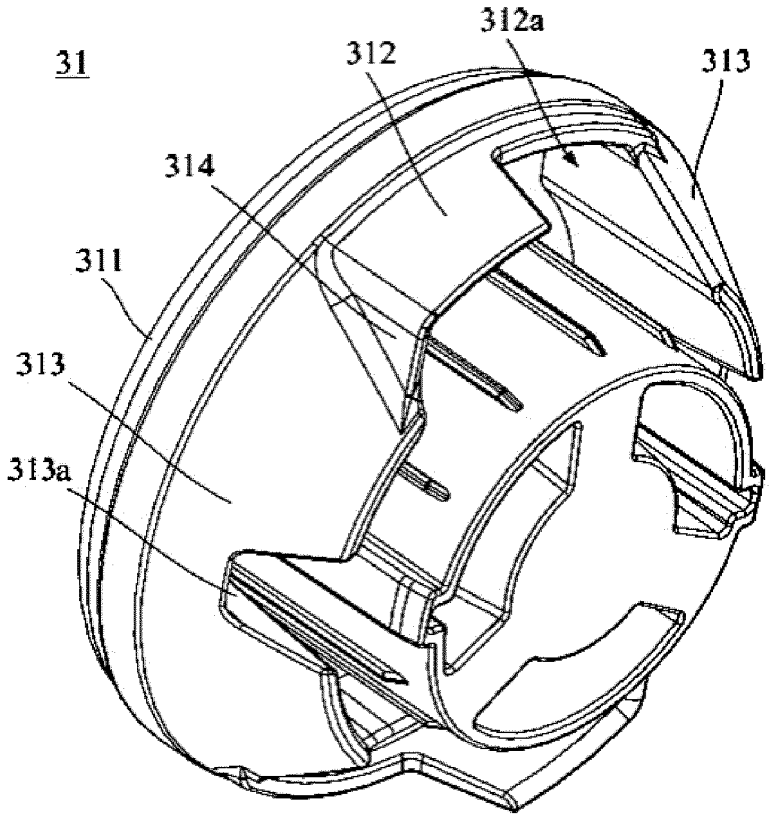

FIG. 12

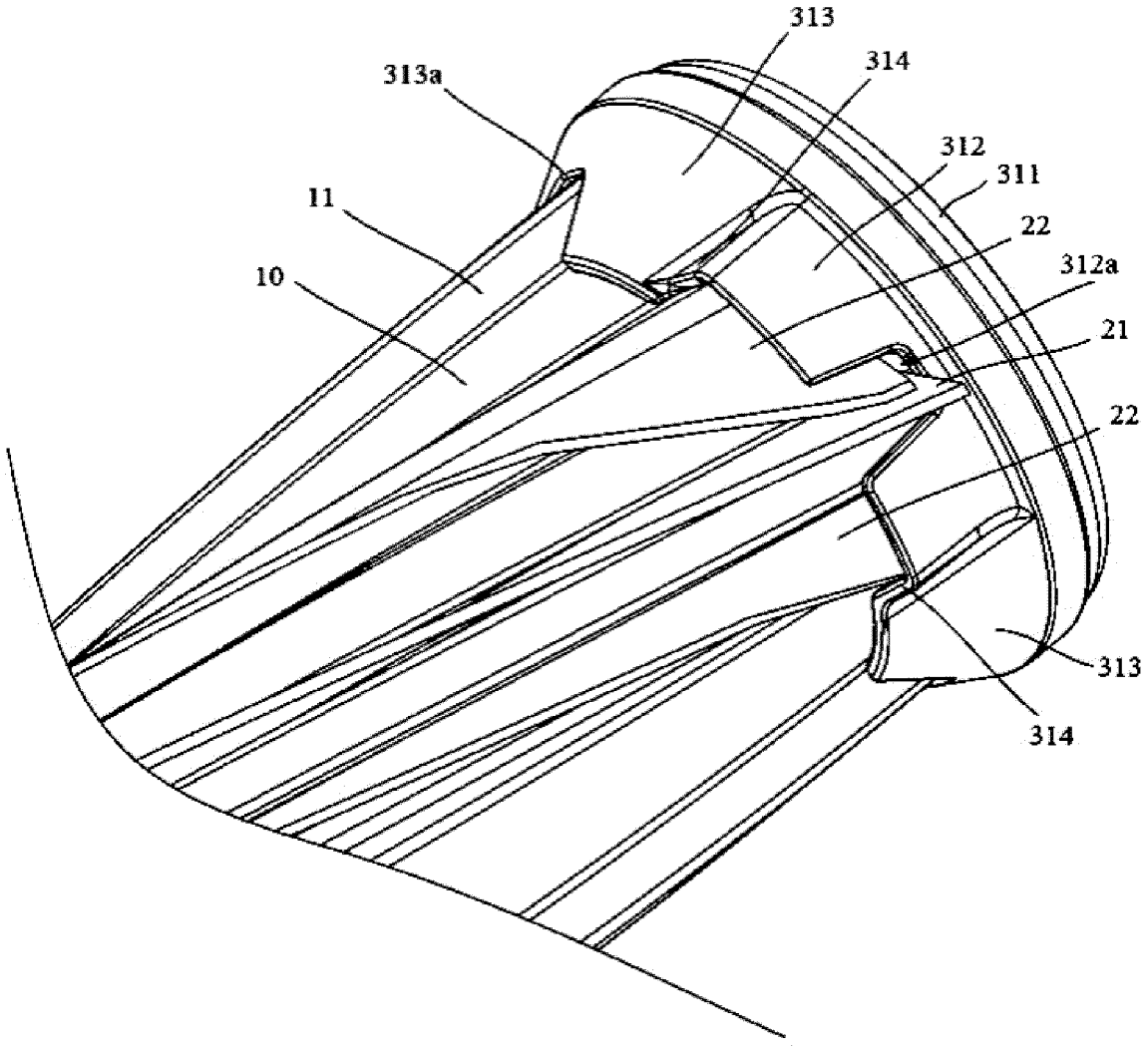

FIG. 13

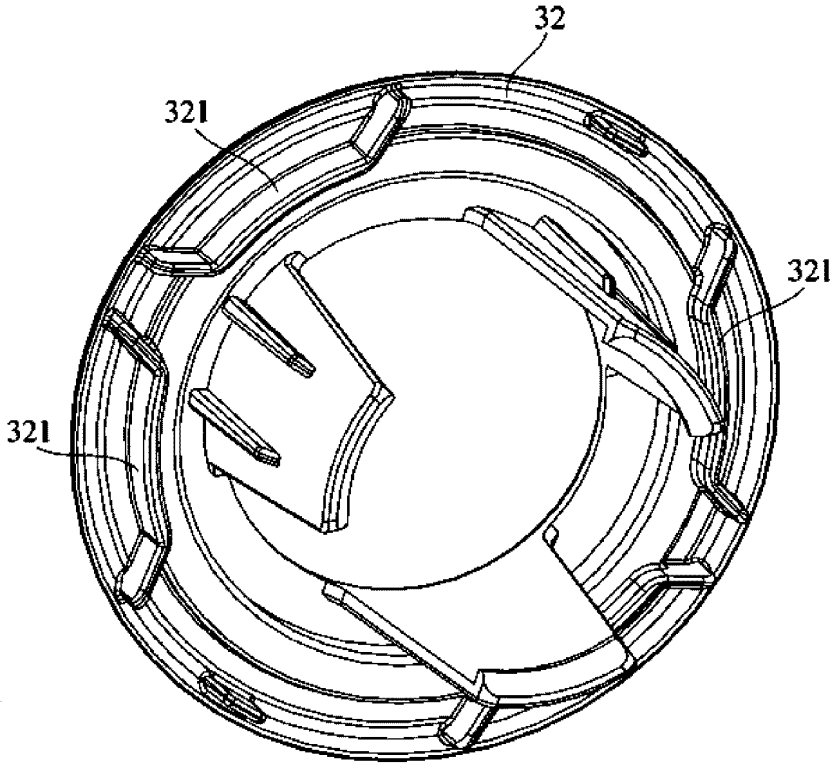

FIG. 14

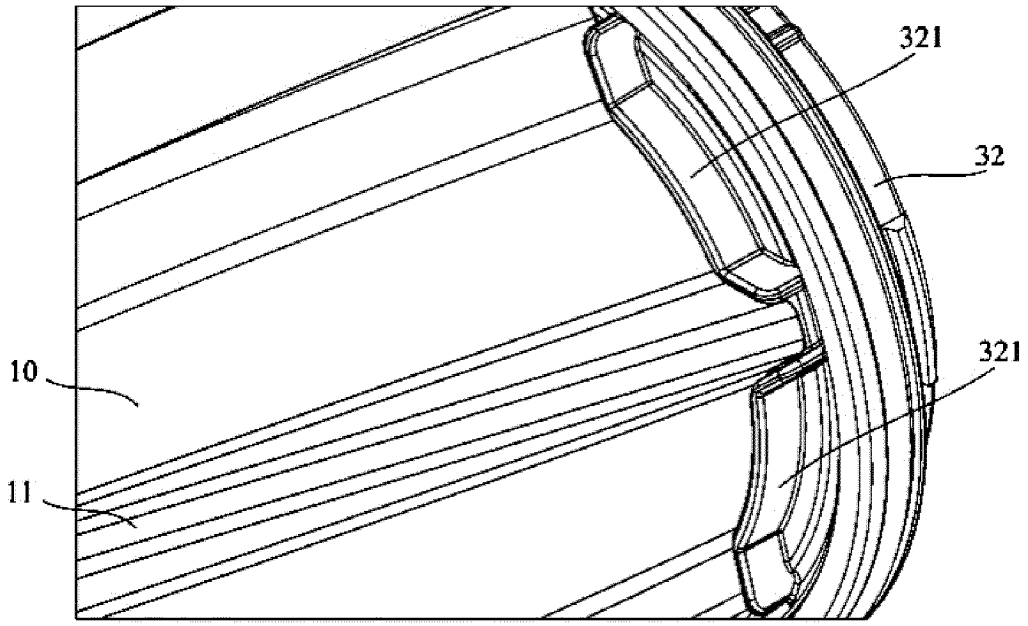

FIG. 15

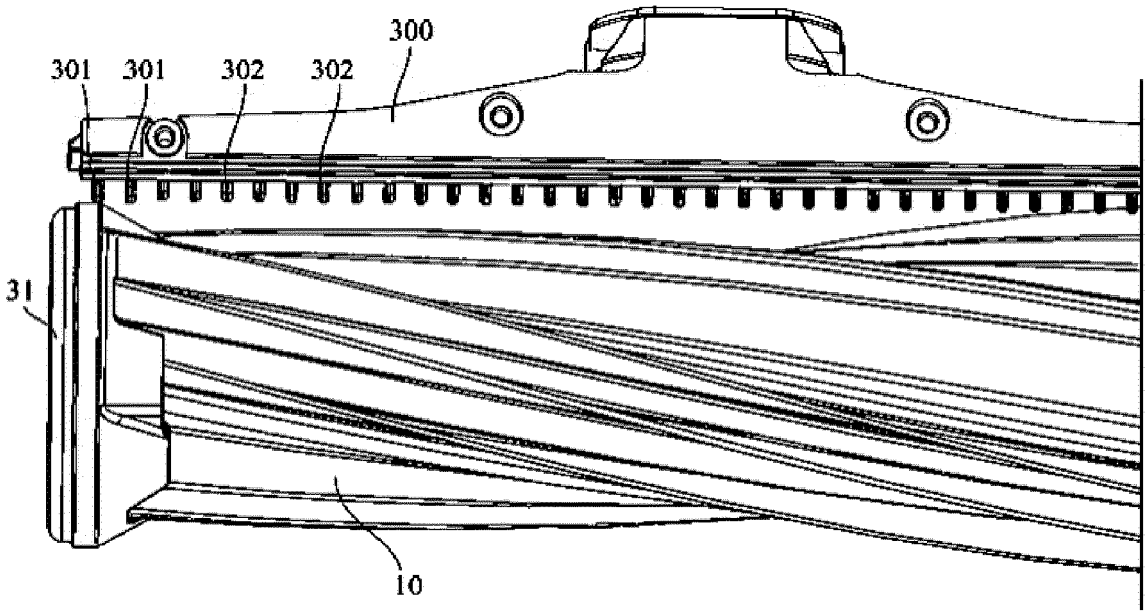

FIG. 16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2024/113232

A. CLASSIFICATION OF SUBJECT MATTER

A47L 11/40(2006.01)i; A47L 11/28(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, A46B

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

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

CNTXT, CNABS, ENTXTC, ENTXT, VEN: 滚刷, 刷辊, 刷, 毛发, 头发, 缠绕, 交替, 倾斜, 螺旋, 周向, 延伸, 胶条, 肋, 支撑条, roll+, brush, inclin+, oblique+, extend, circumferential direction, supporting, strip?, hair, wind+, alternat+, spiral

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 211299799 U (SKYBEST ELECTRIC APPLIANCE (SUZHOU) CO., LTD.) 21 August 2020 (2020-08-21) description, paragraphs 42-127, and figures 1-18	1-13
X	CN 115243591 A (TECHTRONIC FLOOR CARE TECHNOLOGY LIMITED) 25 October 2022 (2022-10-25) description, paragraphs 29-47, and figures 1-15	1-13
X	US 2019298124 A1 (OMACHRON INTELLECTUAL PROPERTY INC.) 03 October 2019 (2019-10-03) description, paragraphs 7-20, and figures 1-117	1-13
A	CN 116725420 A (MIDEA ROBOZONE TECHNOLOGY CO., LTD.) 12 September 2023 (2023-09-12) entire document	1-13
A	CN 218960631 U (SUZHOU DEERMA CLEANING TECHNOLOGY CO., LTD.) 05 May 2023 (2023-05-05) entire document	1-13

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

* Special categories of cited documents:
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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	Date of mailing of the international search report
23 November 2024	**25 November 2024**
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.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2024/113232

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 219331524 U (YUNJING INTELLIGENCE TECHNOLOGY (DONGGUAN) CO., LTD. et al.) 14 July 2023 (2023-07-14) entire document	1-13

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2024/113232

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 211299799 U	21 August 2020	None	
CN 115243591 A	25 October 2022	AU 2020423700 A1	28 July 2022
		US 2021212535 A1	15 July 2021
		EP 4090209 A1	23 November 2022
		WO 2021146050 A1	22 July 2021
US 2019298124 A1	03 October 2019	US 10722087 B2	28 July 2020
CN 116725420 A	12 September 2023	None	
CN 218960631 U	05 May 2023	None	
CN 219331524 U	14 July 2023	None	

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 202311237267 **[0001]**
- CN 202311245939X **[0001]**