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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) Floor nozzle

(57) The present invention discloses an efficient floor brush, which comprises a brush body, a brush underplate mounted on the bottom of the brush body, and a primary duct disposed in the brush body, the primary duct being provided with a primary duct opening located at the brush underplate, some groove-type auxiliary ducts being formed on the front and rear sides of the primary duct opening on the bottom of the brush underplate, a separation rib being disposed at a junction of the primary duct with the auxiliary duct. This efficient floor brush of the present invention can increase the air volume of the floor brush, thus improving the vacuum efficiency of the floor brush, with the movement resistance of the floor brush on a carpet reduced.

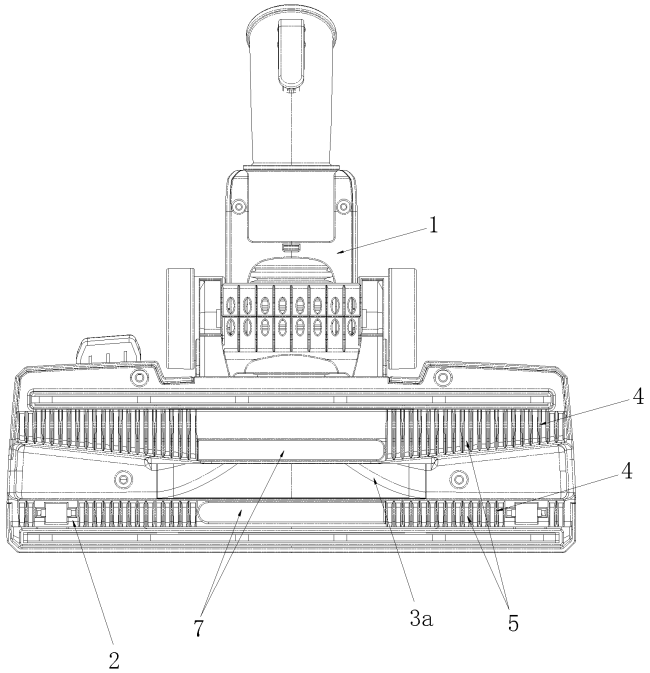

Fig.1

EP 2 987 444 A1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to the field of cleaning products, specifically to an efficient floor brush that can be used in a vacuum cleaner.

BACKGROUND OF THE INVENTION

[0002] The floor brush currently sold on the market has a brush underplate that is of a faceplate structure of a plate or a plane plus an incline. When such a floor brush is used on a carpet, the flat lower surface of the brush underplate will be completely fit with the carpet, making the exterior air current hard to enter the brush duct, with the floor brush inhaling dust totally depending on the degree of vacuum without taking full advantage of the air-volume vacuum function; besides, the large-particle dust hidden in the carpet wool cannot enter the brush duct so as to be taken away because the carpet wool is pressed down tightly, which results in the worse vacuum effect.

CONTENTS OF THE INVENTION

[0003] A purpose of the present invention is as follows: In order to solve the above problems, the present invention provides an efficient floor brush of a new structure, which can increase the air volume of the floor brush without substantially decreasing the degree of vacuum of the floor brush, thus improving the vacuum efficiency of the brush, with the movement resistance of the floor brush on the carpet reduced as well.

[0004] A technical solution of the present invention is as follows: The efficient floor brush comprises a brush body, a brush underplate mounted on the bottom of the brush body, and a primary duct disposed in the brush body, the primary duct being provided with a primary duct opening located at the brush underplate, some groove-type auxiliary ducts being formed on the front and rear sides of the primary duct opening on the bottom of the brush underplate, a separation rib being disposed at a junction of the primary duct with the auxiliary duct.

[0005] Based on the above technical solution, the present invention further includes the following preferred solution:

There is a certain distance between every two adjacent auxiliary ducts, and thus a convex rib is formed therebetween; at a junction of the separation rib with the convex rib, the lower surface of the separation rib is flush with the lower surface of the convex rib;

the lower surface of the convex rib is gradually elevated in a direction from being close to the separation rib to being away from the separation rib;

the separation rib is of a linear structure;

the separation rib is of a curvilinear structure;

the auxiliary duct is of a linear structure;

the primary duct is of a prolate structure, with an angle of 0-90° between the length direction of the auxiliary duct and the length direction of the primary duct opening;

the auxiliary duct is disposed vertically to the primary duct opening; and

the auxiliary duct is of a curvilinear structure.

[0006] The present invention has the following advantages: When this efficient floor brush of the present invention is in use, the groove-type auxiliary duct on the bottom of the floor brush reduces the region where the brush underplate compresses the carpet, correspondingly reducing resistance of the air current in the carpet, thus increasing the air volume when the floor brush is vacuuming the carpet, which is conducive to the use of air volume to take away the dust on the carpet, improvement of the vacuum capability of the floor brush, and reduction of the movement resistance of the floor brush on the carpet as well. Meanwhile, the convex rib on the bottom of the floor brush will also poke aside the carpet wool on the carpet, comb the compact carpet wool loose, and make the particulates hidden in carpet wool taken by the air current into the primary duct and then into a dust-collecting device, further improving the dust removal capability of the floor brush. The separation rib disposed at the junction of the primary duct with the auxiliary duct plays a role in sealing the primary duct opening, and ensuring a negative air pressure at the primary duct opening when the floor brush is in operation; besides, when the floor brush is working on the carpet, the separation rib can go deeper into the carpet, thus achieving the improved vacuum efficiency for the carpet.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The present invention will be further described below with reference to the drawings and examples.

Fig. 1 is a structural schematic view of the bottom of the efficient floor brush of an example of the present invention;

Fig. 2 is a structural schematic view of the side of the efficient floor brush of an example of the present invention; and

Fig. 3 is a structural schematic view of the bottom of the efficient floor brush of the present invention having another specific structural form;

wherein: 1. brush body; 2. brush underplate; 3. primary

duct; 3a. primary duct opening; 4. convex rib; 5. auxiliary duct; 6. separation rib; and 7. electrostatic strip.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0008] Figs. 1 and 2 show a specific example of this efficient floor brush of the present invention that, to be the same with the traditional floor brush, also comprises a brush body 1, a brush underplate 2 mounted on the bottom of the brush body, and a primary duct 3 disposed in the brush body 1, the primary duct 3 being provided with a primary duct opening 3a located at the brush underplate 2.

[0009] The key improvement of this example is that some groove-type auxiliary ducts 5 are formed on the front and rear sides of the primary duct opening 3a on the bottom of the brush underplate 2, and a separation rib 6 for preventing air leakage is disposed at the junction of the primary duct 3 with the auxiliary duct 5.

[0010] There is a certain distance between every two adjacent auxiliary ducts 5, and thus a convex rib 4 is formed therebetween.

[0011] It is thus clear that in this example the auxiliary duct 5 and the primary duct 3 are not in direct communication with each other, but have a separation rib 6 disposed therebetween to separate them, which is advantageous to ensure the degree of vacuum at the primary duct opening; besides, the separation rib 6 plays a role in sealing the primary duct opening 3a, which ensures a negative air pressure at the primary duct opening 3a when the floor brush is in operation; moreover, when the floor brush is working on the carpet, the separation rib 6 can go deeper into the carpet, thus achieving the improved vacuum efficiency for the carpet. Without the separation rib 6, the auxiliary duct 5 will be in direct communication with the primary duct 3, which will greatly increase the ventilation area of the primary duct opening 3a with the external world, and result in an air leakage problem at the primary duct opening 3a, thus significantly decreasing the suction of the primary duct 3 and reducing the dust removal capability of the floor brush.

[0012] With reference to Figs. 1 and 2 again, the operational principle of this efficient floor brush of the example will be described as follows: While in use, this floor brush is connected to a vacuum cleaner that is then powered on, and then the floor brush is placed on the carpet in a position and state as shown in Fig. 2 and meanwhile pushed along the carpet surface for vacuuming the carpet; in the process of moving the floor brush, the auxiliary duct 5 on the bottom of the floor brush reduces the region where the brush underplate 2 compresses the carpet, which correspondingly reduces resistance of the air current in the carpet, and thus increases the air volume when the floor brush is vacuuming the carpet; besides, the separation rib 6 disposed between the primary duct 3 and the auxiliary duct 5 can prevent air leakage at the primary duct opening, which well guarantees the degree of vacuum at the primary duct opening and the vacuum capacity of the primary duct, conducive to the use of air volume to take away the dust on the carpet and improvement of the vacuum capability of the floor brush. Meanwhile, the convex rib 4 on the bottom of the floor brush will also poke aside the carpet wool on the carpet, comb the compact carpet wool loose, and make the particulates hidden in the carpet wool taken by the air current into the primary duct 3, which further improves the dust removal capability of the floor brush.

[0013] In this example, at a junction of the separation rib 6 with the convex rib 4, the lower surface of the separation rib 6 is flush with the lower surface of the convex rib 4; that is, at a junction of the separation rib 6 with the convex rib 4, the separation rib 6 and the convex rib 4 have a lower surface with the same height. Besides, the lower surface of the convex rib 4 is gradually elevated into a certain slope in a direction from being close to the separation rib 6 to being away from the separation rib 6; such an arrangement is also made for further ensuring a negative air pressure at the primary duct opening, so as to improve the dust removal capability of the floor brush. Certainly, the height relation between the lower surfaces of the separation rib 6 and convex rib 4 can also be set into other forms.

[0014] The number of the separation rib 6 can be set to be more than one, and the separation rib 6 can be of a linear structure or a curvilinear structure. It is of a linear structure in this example.

[0015] It is found by the designer through tests that a traditional floor brush not of the above structure, while in operation, has a carpet dust removal rate of 74.8% (the dust removal capacity is Grade F), and a forward movement resistance of 45 N. While this floor brush of the present invention of the above structure, while in operation, has a carpet dust removal rate of 81.1% (the dust removal capacity is Grade D), and a forward movement resistance of 30 N. It can be seen that, after adopting this structure of the present invention, the carpet dust removal capability of the floor brush is increased from Grade F to Grade D, and the movement resistance is decreased by 33%, thus the user's operational comfort being improved.

[0016] In this example, these groove-type auxiliary ducts 5 are of a linear structure, and correspondingly each of the convex ribs 4 is also of a linear structure; certainly, an auxiliary duct 5 of a curvilinear structure can also be used, and achieve the same effects as above. It can be seen from Fig. 1 that the respective convex ribs 4 are arranged on the brush underplate 2 in a comb-teeth form.

[0017] In this example, the primary duct opening 3a is of a prolate structure, and the auxiliary duct 5 is disposed vertically to the primary duct opening 3a; that is, there is an angle of 0-90° between the length direction of the auxiliary duct 5 and the length direction of the primary duct opening 3a, with the length of the auxiliary duct 5 extending in the front and rear direction. Certainly, the angle between the length direction of the auxiliary duct 5 and

the length direction of the primary duct opening 3a can also be set to have any degree of angle within the range of 0-90°(inclined, vertical, or horizontal), which can also achieve the same effects as above.

[0018] Because in this example two electrostatic strips 7 are disposed on the front and rear sides at the center of the primary duct opening 3a, no auxiliary duct 5 is disposed on the front and rear sides at the center of the primary duct opening 3a. If no electrostatic strip 7 is disposed at the primary duct opening 3a, the auxiliary ducts 5 can be disposed all over on the front and rear sides of the primary duct opening 3a on the brush underplate 2, as shown in Fig. 3.

[0019] Certainly, the above examples are used only for explaining the technical concept and characteristics of the present invention. They are provided to make people understand the present invention and implement it, rather than limit the scope of protection of the present invention. Any equivalent alteration or modification made according to the spiritual essence of the primary technical solution of the present invention should fall within the scope of protection of the present invention.

Claims

1. An efficient floor brush, comprising a brush body (1), a brush underplate (2) mounted on the bottom of the brush body, and a primary duct (3) disposed in the brush body (1), the primary duct (3) being provided with a primary duct opening (3a) located at the brush underplate (2), **characterized in that**: some groove-type auxiliary ducts (5) are formed on front and rear sides of the primary duct opening (3a) on the bottom of the brush underplate (2), and a separation rib (6) is disposed at a junction of the primary duct (3) with the auxiliary duct (5).

2. The efficient floor brush according to claim 1, wherein there is a certain distance between every two adjacent auxiliary ducts (5), and thus a convex rib (4) is formed therebetween; at a junction of the separation rib (6) with the convex rib (4), a lower surface of the separation rib (6) is flush with a lower surface of the convex rib (4).

3. The efficient floor brush according to claim 2, wherein the lower surface of the convex rib (4) is gradually elevated in a direction from being close to the separation rib (6) to being away from the separation rib (6).

4. The efficient floor brush according to claim 1, wherein the separation rib (6) is of a linear structure.

5. The efficient floor brush according to claim 1, wherein the separation rib (6) is of a curvilinear structure.

6. The efficient floor brush according to claim 1, wherein the auxiliary duct (5) is of a linear structure.

7. The efficient floor brush according to claim 6, wherein the primary duct opening (3a) is of a prolate structure, with an angle of 0-90° between the length direction of the auxiliary duct (5) and the length direction of the primary duct opening (3a).

8. The efficient floor brush according to claim 7, wherein the auxiliary duct (5) is disposed vertically to the primary duct opening (3a).

9. The efficient floor brush according to claim 1, wherein the auxiliary duct (5) is of a curvilinear structure.

Amended claims in accordance with Rule 137(2) EPC.

1. A vacuum cleaner nozzle, comprising a nozzle body (1), a nozzle underplate (2) mounted on the bottom of the nozzle body (1), and a primary duct (3) disposed in the nozzle body (1), the primary duct (3) being provided with a primary duct opening (3a) located at the nozzle underplate (2), wherein the primary duct opening (3a) is of a prolate structure,
characterized in that
some groove-type auxiliary ducts (5) are formed on front and rear sides of the primary duct opening (3a) on the bottom of the nozzle underplate (2), and a separation rib (6) is disposed at a junction of the primary duct (3) with the groove-type auxiliary duct (5).

2. The vacuum cleaner nozzle according to claim 1, wherein there is a certain distance between every two adjacent groove-type auxiliary ducts (5), and thus a convex rib (4) is formed therebetween; at a junction of the separation rib (6) with the convex rib (4), a lower surface of the separation rib (6) is flush with a lower surface of the convex rib (4).

3. The vacuum cleaner nozzle according to claim 2, wherein the lower surface of the convex rib (4) is gradually elevated in a direction from being close to the separation rib (6) to being away from the separation rib (6).

4. The vacuum cleaner nozzle according to claim 1, wherein the separation rib (6) is of a linear structure.

5. The vacuum cleaner nozzle according to claim 1, wherein the separation rib (6) is of a curvilinear structure.

6. The vacuum cleaner nozzle according to claim 1, wherein the groove-type auxiliary duct (5) is of a linear structure.

7. The vacuum cleaner nozzle according to claim 6, wherein an angle between the length direction of the groove-type auxiliary duct (5) and the length direction of the primary duct opening (3a) is greater than 0° but not greater than 90°;.

8. The vacuum cleaner nozzle according to claim 7, wherein the groove-type auxiliary duct (5) is disposed vertically to the primary duct opening (3a).

9. The vacuum cleaner nozzle according to claim 1, wherein the groove-type auxiliary duct (5) is of a curvilinear structure.

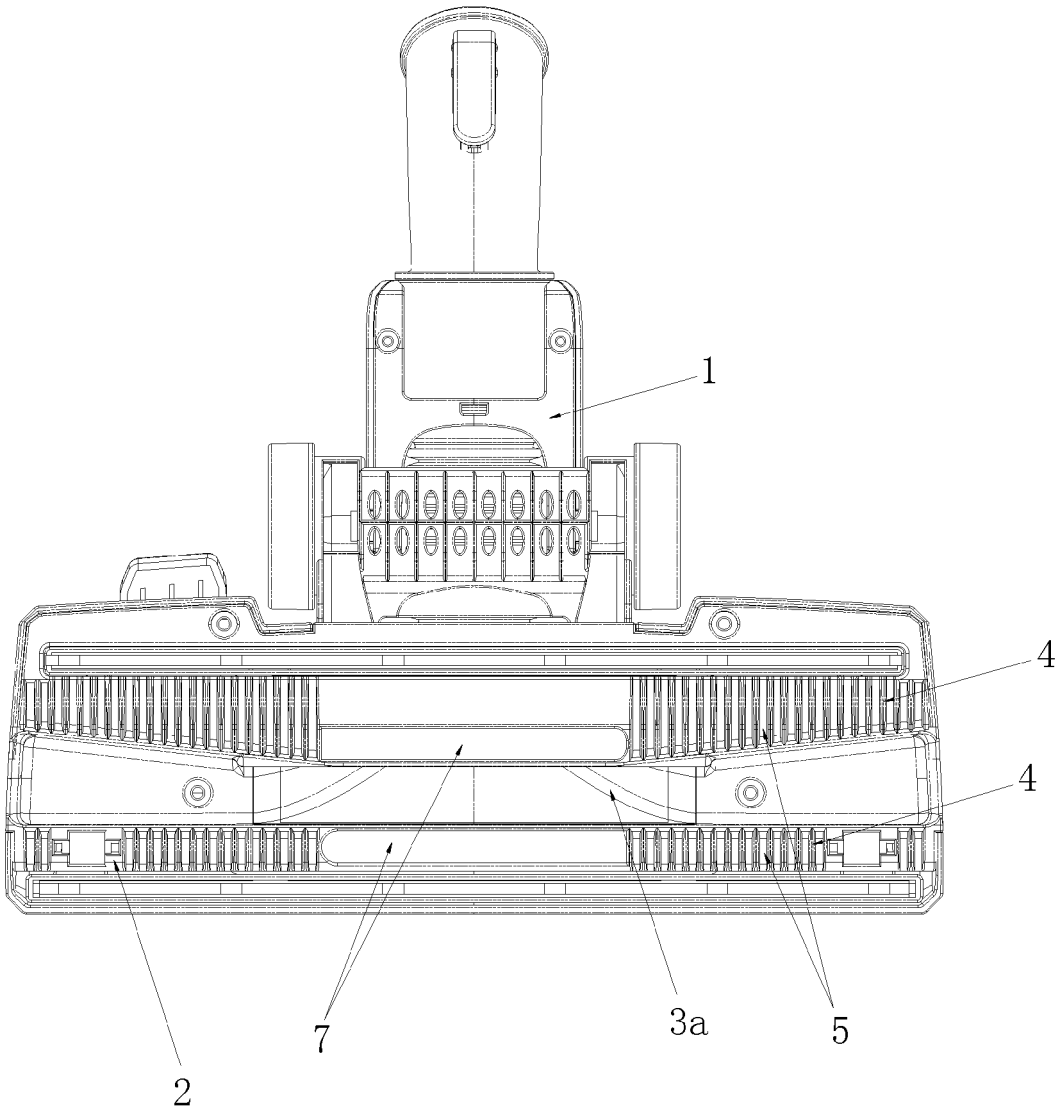

Fig.1

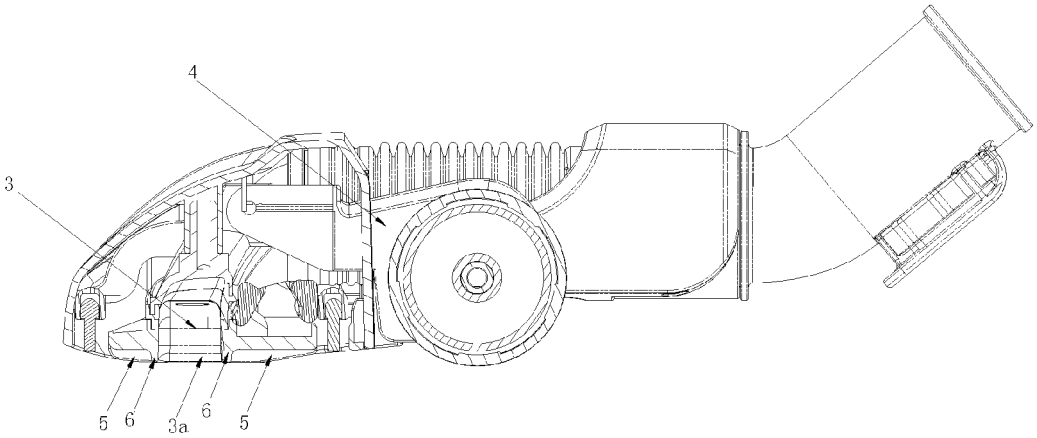

Fig.2

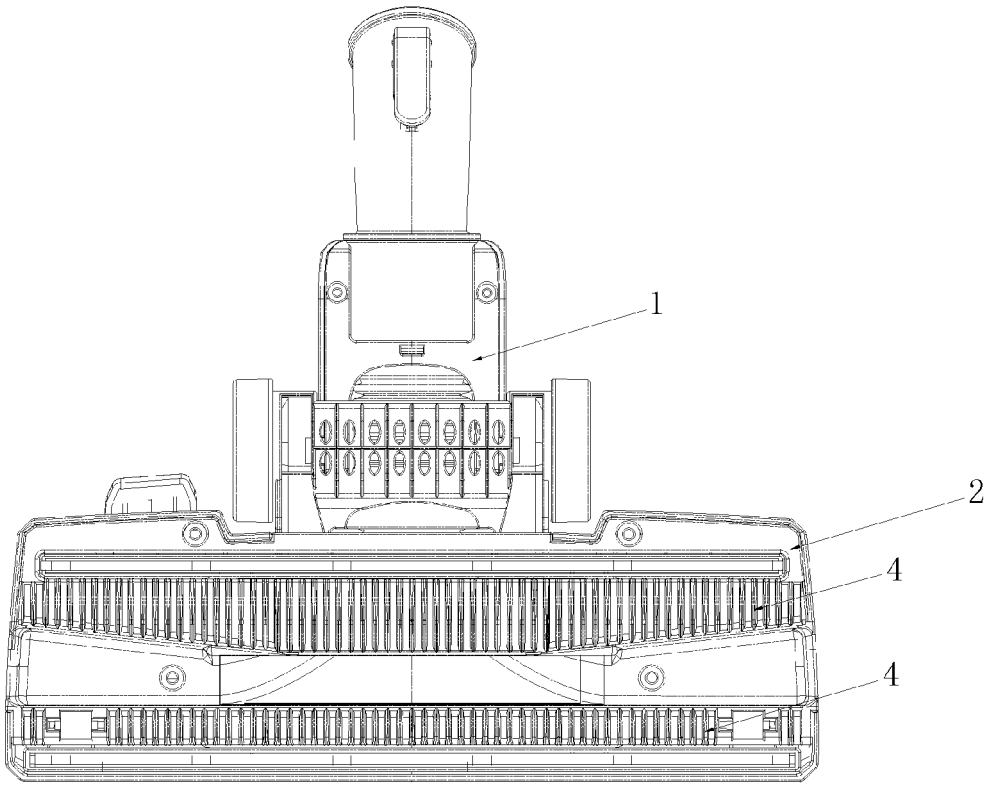

Fig.3

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EUROPEAN SEARCH REPORT

Application Number
EP 14 19 2755

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 February 2015	Eckenschwiller, A

CATEGORY OF CITED DOCUMENTS

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