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(54) FLOOR BRUSH STRUCTURE

(57) The present disclosure discloses a floor brush structure. A rolling brush includes a rolling body, hard bristles and soft bristles, the rolling body is rotatably disposed in a housing, a plurality of hard bristles are disposed on an outer surface of the rolling body, a plurality of soft bristles are disposed on the outer surface of the rolling body, a height of the hard bristles is lower than a height of the soft bristles, and a height difference range of the hard bristles and the soft bristles is 0.2 mm to 5 mm. Comb teeth are disposed in the housing and correspond to the rolling brush, when the rolling brush rotates, tooth tips of the comb teeth are able to be inserted into the hard bristles and/or the soft bristles to comb hairs tangled on the rolling brush, and a depth range is 0.1 mm to 5 mm. In this solution, by installing the hard bristles and the soft bristles on the rolling body, when hairs on a floor are cleaned away, direct contact between the hairs and the hard bristles is reduced, at the same time, the hairs tangled on the rolling brush are combed by cooperating with the comb teeth, and installation parameters and structures of the bristles and the comb teeth are matched at high precision during installation, so that a floor brush achieves an efficient cleaning function.

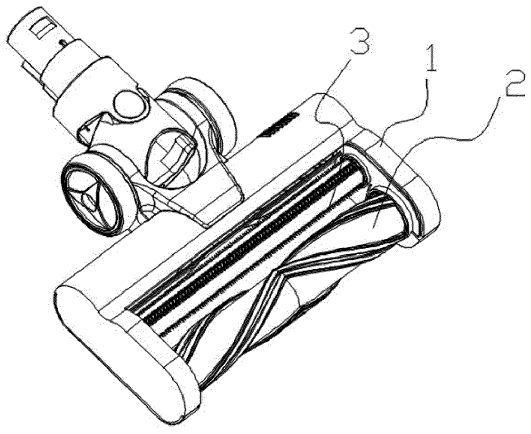

Fig. 1

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Description

Technical Field

[0001] The present disclosure relates to the technical field of cleaning devices, in particular to a floor brush structure.

Background

[0002] For a traditional hard bristle rolling brush, there will be a large quantity of hairs tangled on the rolling brush during use, hard fiber bristles have a hard texture, once the hairs are tangled on the rolling brush, it is difficult to clean away, while a traditional soft bristle rolling brush has less prominent hair tangling problems compared to the hard bristle rolling brush. However, when cleaning a carpet, since soft bristles cannot be inserted into pile of the carpet, the carpet cleaning effect is not ideal compared to the hard bristles. Therefore, the traditional floor brushes cannot simultaneously solve hair tangling and ensure the cleaning effect, and the high efficiency of the floor brushes cannot be achieved.

[0003] It should be noted that the introduction of the background above is only for the purpose of providing a clear and complete explanation of the technical solution of the present disclosure and facilitating the understanding of those skilled in the art. The above technical solutions cannot be considered as well-known to those skilled in the art solely because they are elaborated in the background section of the present disclosure.

Summary

[0004] In order to overcome the above shortcomings, an objective of the present disclosure is to provide a floor brush structure, through high-precision matching of structures and installation parameters of soft bristles, hard bristles and comb teeth, high efficiency of a floor brush is achieved, and thus the above technical problem is effectively solved.

[0005] In order to achieve the above objective, the technical solution adopted by the present disclosure is a floor brush structure, including:

a housing;
a rolling brush, including a rolling body, hard bristles and soft bristles, wherein
the rolling body is rotatably disposed in the housing, a plurality of hard bristles are disposed on an outer surface of the rolling body, a plurality of soft bristles are disposed on the outer surface of the rolling body, a height of the hard bristles is lower than a height of the soft bristles, and a height difference range of the hard bristles and the soft bristles is 0.2 mm to 5 mm; and
comb teeth, disposed in the housing and corresponding to the rolling brush, wherein when the rolling brush rotates, tooth tips of the comb teeth are able to be inserted into the hard bristles and the soft bristles to comb hairs tangled on the rolling brush, and a depth range of the tooth tips of heads of the comb teeth inserted into the hard bristles and the soft bristles is 0.1 mm to 5 mm.

[0006] The present disclosure has the beneficial effects: the soft bristles and the hard bristles are installed on the rolling body, when cleaning hairs on a floor, since the height of the soft bristles is larger than that of the hard bristles, the hairs may be cleaned away through the soft bristles, direct contact between the hairs and the hard bristles is reduced, at the same time, the hairs tangled on the rolling brush are combed by cooperating with the comb teeth, so that the technical problem that the floor brush is difficult to clean away due to hair tangling is effectively solved, the hard bristles on the rolling body may be inserted into pile of a carpet for cleaning it when the carpet is cleaned, and a function of the floor brush may not be affected. At the same time, in an installation process, parameters, such as the height difference between the soft bristles and the hard bristles and the depth of the comb teeth inserted into the soft bristles and the hard bristles are matched with an installation structure in high precision, so that optimal efficiency of the floor brush can be achieved during working.

[0007] When establishing installation parameters, a specific process is as follows:

1) the height difference between the hard bristles and the soft bristles needs to be controlled within a range of 0.2 mm to 5 mm, including 0.2 mm and 5 mm. Because when the heights of the hard bristles and the soft bristles are within this range, when it is used for cleaning the carpet, the hard bristles may be inserted into the pile of the carpet, which may easily remove dust from gaps of the carpet to be sucked by a vacuum cleaner, without affecting a cleaning effect of the rolling brush on the carpet, and when it is used for cleaning the floor, the height of the soft bristles is larger than that of the hard bristles, the soft bristles are in contact with the floor to clean it, the hairs on the floor are in contact with the soft bristles first, and a situation that the hairs are in direct contact with the hard bristles to be tangled on the rolling brush, which are difficult to clean away is avoided. In addition, when cleaning the floor, a situation that the gloss of the floor is damaged by direct contact between the hard bristles and the floor can further be effectively prevented. If the height

difference between the hard bristles and the soft bristles is smaller than 0.2 mm, the hard bristles and the soft bristles are almost of the same height, in this way, when the brush is used for cleaning the floor, the hard bristles are likely to be in direct contact with the hairs, causing the hairs to be tangled on the rolling brush, and moreover, the hard bristles may further be in contact with the floor, causing damage to the floor. If the height difference between the hard bristles and the soft bristles is greater than 5 mm, the height difference between the hard bristles and the soft bristles is too large, in this way, when the brush is used for cleaning the carpet, the hard bristles cannot be inserted into the pile of the carpet, thereby affecting the cleaning effect on the carpet.

2) During installation, it is necessary to ensure that the depth of tooth tips of the heads of the comb teeth inserted into the hard bristles and the soft bristles is within a range of 0.1 mm to 5 mm, because only the depth of the tooth tips inserted into the bristles is controlled within this range, the tooth tips of the comb teeth can effectively achieve the goal of not affecting the rotation of the rolling brush but also effectively combing the hairs tangled on the rolling brush. If the insertion depth is smaller than 0.1 mm, the hairs tangled on the rolling brush cannot be effectively cleaned away by the tooth tips of the comb teeth. If the insertion depth is greater than 5 mm, the tooth tips of the comb teeth may affect the normal rotation of the rolling brush due to excessive insertion.

[0008] Further, a plurality of tooth tips of the comb teeth are arranged in an axial direction of the rolling body, a spacing range between two adjacent tooth tips is 2 mm to 6 mm, and a tooth tip angle range of the heads of the comb teeth is 8° to 105°. When an angle of the tooth tips of the heads of the comb teeth is within the range of 8° to 105°, the tooth tips of the comb teeth are inserted into the bristles, so as to effectively comb the tangled hairs. If the angle of the tooth tips of the comb teeth is smaller than 8°, the strength at the tooth tips is too low, which is easy to break, and it is also difficult to form during manufacturing. If the angle of the tooth tips of the comb teeth is greater than 105°, the tooth tips of the comb teeth are too large, and the tangled hairs cannot be effectively cleaned away.

[0009] Further, the plurality of hard bristles are arranged on a surface of one substrate to form a plurality of hard bristle strips, the plurality of soft bristles are arranged on a surface of one substrate to form a plurality of soft bristle strips, and the hard bristle strips and the soft bristle strips are divided into a plurality of groups of one hard bristle strip and one soft bristle strip to be disposed on a surface of the rolling body. When the hard bristles and the soft bristles are installed on the rolling body, all the hard bristles may be woven onto one substrate to form a complete hard bristle strip, then all the soft bristles are woven on one substrate to form a complete soft bristle strip, and then the hard bristle strips and the soft bristle strips are installed on the rolling body in pairs.

[0010] Further, a plurality of first grooves are formed in the surface of the rolling body, each first groove is a combined groove with two grooves as one group, one hard bristle strip is installed in one groove, and one soft bristle strip is installed in the other groove. When the hard bristles and the soft bristles are installed on the rolling body, all the hard bristles may be woven on one substrate to form a complete hard bristle strip, then all the soft bristles are woven on one substrate to form a complete soft bristle strip, and then the hard bristle strips and the soft bristle strips are installed on the rolling body in pairs. When the hard bristle strips and the soft bristle strips are installed on the rolling body in pairs, grooves may be formed in the rolling body, the grooves may be in a V-shape, an inverted V-shape, a spiral shape and the like, and the hard bristle strips and the soft bristle strips may be inserted into the grooves through oblique or direct insertion to complete the installation. At the same time, the grooves may also be omitted, and the hard bristle strips and the soft bristle strips directly adhere to the rolling body with glue.

[0011] Further, a spacing range between the two grooves in the combined groove is 1 mm to 15 mm. When the hard bristle strips and the soft bristle strips are used in pairs, a spacing between the two grooves cannot exceed 15 mm, if it exceeds 15 mm, when the rolling brush is used, the hard bristle strips and the soft bristle strips cannot be matched with each other, so the spacing range of the grooves for installing the hard bristle strips and the soft bristle strips set to be 1 mm to 15 mm.

[0012] Further, the plurality of soft bristles and the plurality of hard bristles are disposed on a surface of one substrate at the same time to form a plurality of soft and hard bristle strips, and the soft and hard bristle strips are disposed on the surface of the rolling body. The soft bristles and the hard bristles are woven with one substrate to form a complete soft and hard bristle strip, and then the soft and hard bristle strips are installed on the rolling brush.

[0013] Further, the plurality of hard bristles are arranged on the substrate to form a hard bristle layer, the plurality of soft bristles are arranged on the surface of the substrate to form a soft bristle layer, and the hard bristle layer and the soft bristle layer are disposed in parallel. On the soft and hard bristle strips, all the hard bristles are arranged to form a hard bristle layer, all the soft bristles are arranged to form a soft bristle layer, and the soft bristle layer and the hard bristle layer are arranged in parallel.

[0014] Further, a spacing range between the hard bristle layer and the soft bristle layer is 0 mm to 15 mm. When the hard bristle layer and the soft bristle layer are parallelly formed into a brush layer and disposed on the surface of the substrate, there may not or may be a spacing between the hard bristle layer and the soft bristle layer, but the spacing between the two cannot exceed 15 mm, and if it exceeds 15 mm, when the rolling brush is used, the hard bristles and soft bristles on the bristle strips cannot be matched with each other.

[0015] Further, a plurality of second grooves are formed in the surface of the rolling body, and one soft and hard bristle strip is installed in one second groove. When the soft and hard bristle strips are installed on the rolling body, grooves may be formed in the rolling body, the grooves may be in a V-shape, an inverted V-shape, a spiral shape and the like, and the soft and hard bristle strips may be inserted into the grooves through oblique or direct insertion to complete the installation. At the same time, the grooves may also be omitted, and the soft and hard bristle strips directly adhere to the rolling body with glue.

Brief Description of Figures

[0016]

Fig. 1 is an overall schematic structural diagram of a floor brush of the present disclosure.
Fig. 2 is a schematic structural diagram of comb teeth of the present disclosure.
Fig. 3 is a schematic diagram of hard bristles and soft bristles of the present disclosure.
Fig. 4 is a schematic structural diagram of soft and hard bristles on a rolling body in Embodiment 1 of the present disclosure.
Fig. 5 is a schematic structural diagram of soft and hard bristles on a rolling body in Embodiment 2 of the present disclosure.

[0017] In the figures: 1, housing; 2, rolling brush; 3, comb tooth;

2.1, rolling body; 2.2, hard bristle; 2.3, soft bristle;
100, hard bristle strip; 200, soft bristle strip; 300, first groove;
400, soft and hard bristle strip; 500, hard bristle layer; 600, soft bristle layer; and 700, second groove.

Detailed Description

[0018] The preferred embodiments of the present disclosure are described in detail below in combination with accompanying drawings, so that the advantages and features of the present disclosure can be more easily understood by those skilled in the art, and the scope of protection of the present disclosure can be more clearly defined.

[0019] Please refer to Figs. 1-5. It should be noted that in the description of the present disclosure, it needs to be noted that directional or positional relationships indicated by terms such as "center", "upper", "lower", "left", "right", "vertical", "horizontal", "inner" and "outer" are based on directional or positional relationships as shown in the accompanying drawings, or directional or positional relationships that are commonly placed when the invention product is used, and are only for the purposes of facilitating describing the present disclosure and simplifying the description, rather than indicating or implying that the referred apparatus or element has to have a specific direction or be constructed and operated in the specific direction, and therefore, they cannot be regarded as limitations to the present disclosure. In addition, the terms "first", "second" and "third" are only used to distinguish descriptions, and cannot be understood as indicating or implying relative importance. The terms "horizontal", "vertical", "overhang" and the like do not mean that the components are required to be absolutely horizontal or suspended, but may be slightly tilted. For example, "horizontal" only refers to its direction being more horizontal compared to "vertical", it does not mean that the structure mush be completely horizontal, but may be slightly tilted.

[0020] In the description of the present disclosure, it should be noted that the terms "set", "installed", "connected" and "connection" should be understood in a broad sense unless otherwise specified and defined, for example, "connection" may be fixed connection or detachable connection or integrated connection, may be mechanical connection or electric connection, may be direct connection or indirect connection through an intermediate medium, and may be internal connection of two elements. For those ordinarily skilled in the art, the specific meanings of the above terms in the present disclosure may be understood in specific situations.

Embodiment 1:

[0021] This embodiment provides a floor brush structure, as shown in Figs. 1-2, the floor brush structure includes a housing 1; and further includes a rolling brush 2, the rolling brush 2 includes a rolling body 2.1, hard bristles 2.2 and soft bristles 2.3, wherein the rolling body 2.1 is rotatably disposed in the housing 1, a plurality of hard bristles 2.2 are arranged around an outer surface of the rolling body 2.1, a plurality of soft bristles 2.3 are arranged on an outer surface of the rolling body 2.1, and a height of the hard bristles 2.2 is lower than a height of the soft bristles 2.3; and
the floor brush structure further includes comb teeth 3, disposed in the housing 1 and corresponding to the rolling brush 2. When the rolling brush 2 rotates, tooth tips of the comb teeth 3 are able to be inserted into the hard bristles 2.2 and the soft

bristles 2.3 to comb hairs tangled on the rolling brush 2.

[0022] In the above embodiment, a height difference range of the hard bristles 2.2 and the soft bristles 2.3 is 0.2 mm to 5 mm; and a height difference between the hard bristles 2.2 and the soft bristles 2.3 needs to be controlled within the range of 0.2 mm to 5 mm, including 0.2 mm and 5 mm.

[0023] Because when the heights of the hard bristles 2.2 and the soft bristles 2.3 are within this range, when the floor brush structure is used for cleaning a carpet, the hard bristles 2.2 may be inserted into pile of the carpet, which may easily remove dust from gaps of the carpet to be sucked by a vacuum cleaner, without affecting a cleaning effect of the rolling brush 2 on the carpet, and when it is used for cleaning a floor, the height of the soft bristles 2.3 is larger than that of the hard bristles 2.2, the soft bristles 2.3 are in contact with the floor to clean it, the hairs on the floor are in contact with the soft bristles 2.3 first, and a situation that the hairs are in direct contact with the hard bristles 2.2 to be tangled on the rolling brush 2, which are difficult to clean away is avoided. In addition, when cleaning the floor, a situation that the gloss of the floor is damaged by direct contact between the hard bristles 2.2 and the floor can further be effectively prevented. If the height difference between the hard bristles 2.2 and the soft bristles 2.3 is smaller than 0.2 mm, the hard bristles 2.2 and the soft bristles 2.3 are almost of the same height, in this way, when the brush is used for cleaning the floor, the hard bristles 2.2 are likely to be in direct contact with the hairs, causing the hairs to be tangled on the rolling brush 2, and moreover, the hard bristles 2.2 may further be in contact with the floor, causing damage to the floor. If the height difference between the hard bristles 2.2 and the soft bristles 2.3 is greater than 5 mm, the height difference between the hard bristles 2.2 and the soft bristles 2.3 is too large, in this way, when the brush is used for cleaning the carpet, the hard bristles 2.2 cannot be inserted into the pile of the carpet, thereby affecting the cleaning effect on the carpet.

[0024] The following table shows statistical results of a height difference test for soft and hard bristles:

Soft bristles	Hard bristles	Pile height head mm	Spacing of central points of comb teeth mm	Test scenario 1	Test scenario 2	Grams for hair usage	Grams for hair suction	Ratio of tangling	Current consumption value of floor brush
Puffing pile	0.06 mm hard bristles	0	3.0	Floor		5	3.05	50.01%	0.52A
Puffing pile	0.06 mm hard bristles	0	3.0	Floor	Carpet	5	2.88	53.26%	0.54A
Puffing pile	0.08 mm hard bristles	0.1	3.0	Floor		5	3.16	45.20%	0.51A
Puffing pile	0.08 mm hard bristles	0.1	3.0	Floor	Carpet	5	3.07	48.70%	0.54A
Puffing pile	0.06 mm hard bristles	0.2	3.0	Floor		5	3.1	38.00%	0.53A
Puffing pile	0.06 mm hard bristles	0.2	3.0	Floor	Carpet	5	2.77	44.60%	0.55A

(continued)

Soft bristles	Hard bristles	Pile height head mm	Spacing of central points of comb teeth mm	Test scenario 1	Test scenario 2	Grams for hair usage	Grams for hair suction	Ratio of tangling	Current consumption value of floor brush
Puffing pile	0.08 mm hard bristles	0.5	3.0	Floor		5	3.35	33.00%	0.53A
Puffing pile	0.08 mm hard bristles	0.5	3.0	Floor	Carpet	5	3.22	35.60%	0.54A
Puffing pile	0.16 mm hard bristles	1.0	3.0	Floor		5	4.58	8.40%	0.56A
Puffing pile	0.16 mm hard bristles	1.0	3.0	Floor	Carpet	5	4.44	11.20%	0.57A
Puffing pile	0.06 mm hard bristles	1.5	3.0	Floor		5	4.63	7.40%	0.57A
Puffing pile	0.06 mm hard bristles	1.5	3.0	Floor	Carpet	5	4.47	10.60%	0.59A
Puffing pile	0.08 mm hard bristles	2.0	3.0	Floor		5	4.99	0.20%	0.59A
Puffing pile	0.08 mm hard bristles	2.0	3.0	Floor	Carpet	5	4.97	0.60%	0.61A
Puffing pile	0.16 mm hard bristles	2.5	3.0	Floor		5	4.99	0.20%	0.61A
Puffing pile	0.16 mm hard bristles	2.5	3.0	Floor	Carpet	5	4.98	0.40%	0.64A
Puffing pile	0.06 mm hard bristles	3.0	3.0	Floor		5	4.99	0.20%	0.65A

(continued)

Soft bristles	Hard bristles	Pile height head mm	Spacing of central points of comb teeth mm	Test scenario 1	Test scenario 2	Grams for hair usage	Grams for hair suction	Ratio of tangling	Current consumption value of floor brush
Puffing pile	0.06 mm hard bristles	3.0	3.0	Floor	Carpet	5	4.96	0.80%	0.67A
Puffing pile	0.08 mm hard bristles	3.5	3.0	Floor		5	4.98	0.40%	0.68A
Puffing pile	0.08 mm hard bristles	3.5	3.0	Floor	Carpet	5	4.90	2.00%	0.72A
Puffing pile	0.16 mm hard bristles	4.0	3.0	Floor		5	4.91	1.80%	0.73A
Puffing pile	0.16 mm hard bristles	4.0	3.0	Floor	Carpet	5	4.78	4.40%	0.76A
Puffing pile	0.08 mm hard bristles	4.5	3.0	Floor		5	4.92	1.60%	0.75A
Puffing pile	0.08 mm hard bristles	4.5	3.0	Floor	Carpet	5	4.70	6.00%	0.79A
Puffing pile	0.16 mm hard bristles	5.0	3.0	Floor		5	4.16	16.80%	0.82A
Puffing pile	0.16 mm hard bristles	5.0	3.0	Floor	Carpet	5	3.64	27.20%	0.93A
Puffing pile	0.06 mm hard bristles	6.0	3.0	Floor		5	3.35	33.35%	1.01A
Puffing pile	0.06 mm hard bristles	6.0	3.0	Floor	Carpet	5	2.99	38.50%	1.12A

(continued)

Soft bristles	Hard bristles	Pile height head mm	Spacing of central points of comb teeth mm	Test scenario 1	Test scenario 2	Grams for hair usage	Grams for hair suction	Ratio of tangling	Current consumption value of floor brush
Puffing pile	0.16 mm hard bristles	6.0	3.0	Floor		5	2.92	43.60%	1.16A
Puffing pile	0.16 mm hard bristles	6.0	3.0	Floor	Carpet	5	2.56	45.88%	1.22A

[0025] In the above embodiment, a plurality of tooth tips of the comb teeth 3 are arranged in an axial direction of the rolling body 2.1, and a spacing range between two adjacent tooth tips is 2 mm to 6 mm.

[0026] When the tooth tips arranged in the axial direction are inserted into the rolling brush 2, a range of the comb teeth 3 to comb the hairs on the rolling brush 2 may cover the whole rolling brush 2, so that a combing effect on the tangled hairs is effectively improved.

[0027] In the above embodiment, during installation, it is necessary to ensure that a depth of the tooth tips of heads of the comb teeth inserted into the hard bristles and the soft bristles is within a range of 0.1 mm to 5 mm.

[0028] Because only the depth of the tooth tips inserted into the bristles is controlled within this range, the tooth tips of the comb teeth can effectively achieve the goal of not affecting the rotation of the rolling brush but also effectively combing the hairs tangled on the rolling brush. If the insertion depth is smaller than 0.1 mm, the hairs tangled on the rolling brush cannot be effectively cleaned away by the tooth tips of the comb teeth. If the insertion depth is greater than 5 mm, the tooth tips of the comb teeth may affect the normal rotation of the rolling brush due to excessive insertion.

[0029] In the above embodiment, an angle of the tooth tips of the heads of the comb teeth is 8° to 105°.

[0030] When an angle of the tooth tips of the heads of the comb teeth is within the range of 8°to 105°, the tooth tips of the comb teeth are inserted into the bristles, so as to effectively comb the tangled hairs. If the angle of the tooth tips of the comb teeth is smaller than 8°, the strength at the tooth tips is too low, which is easy to break, and it is also difficult to form during manufacturing. If the angle of the tooth tips of the comb teeth is greater than 105°, the tooth tips of the comb teeth are too large, and the tangled hairs cannot be effectively cleaned away.

[0031] In the above embodiment, as shown in Fig. 3, the plurality of hard bristles 2.2 are arranged on a surface of one substrate to form a plurality of hard bristle strips 100, the plurality of soft bristles 2.3 are arranged on a surface of one substrate to form a plurality of soft bristle strips 200, and the hard bristle strips 100 and the soft bristle strips 200 are divided into a plurality of groups of one hard bristle strip 100 and one soft bristle strip 200 to be disposed on the surface of the rolling body 2.1.

[0032] The specific arrangement method may be a continuous spiral shape or a discontinuous spiral shape (for example, the overall arrangement method on the surface of the rolling brush body is a spiral shape, but it is divided into multiple sections, and gaps may be reserved among all sections or all sections are sequentially spliced into a whole).

[0033] It may also be that two spiral shapes are symmetrically disposed on the surface of the rolling brush body, and connected or separated by a certain distance at an axial central position of the rolling brush body.

[0034] When the hard bristles 2.2 and the soft bristles 2.3 are installed on the rolling body 2.1, all the hard bristles 2.2 may be woven onto one substrate to form a complete hard bristle strip 100, then all the soft bristles 2.3 are woven on one substrate to form a complete soft bristle strip 200, and then the hard bristle strips 100 and the soft bristle strips 200 are installed on the rolling body 2.1 in pairs.

[0035] In the above embodiment, a plurality of first grooves 300 are formed in the surface of the rolling body 2.1, each first groove 300 is a combined groove with two grooves as one group, one hard bristle strip 100 is installed in one groove, and one soft bristle strip 200 is installed in the other groove.

[0036] When the hard bristle strips 100 and the soft bristle strips 200 are installed on the rolling body 2.1 in pairs, grooves may be formed in the rolling body 2.1, the grooves may be in a V-shape, an inverted V-shape, a spiral shape and the like, and the hard bristle strips and the soft bristle strips 200 may be inserted into the grooves through oblique or direct insertion to complete the installation. At the same time, the grooves may also be omitted, and the hard bristle strips and the soft

bristle strips 200 directly adhere to the rolling body 2.1 with glue.

[0037] In the above embodiment, a spacing range between the two grooves in the combined groove is 1 mm to 15 mm.

[0038] When the hard bristle strips 100 and the soft bristle strips 200 are used in pairs, a spacing between the two grooves cannot exceed 15 mm, if it exceeds 15 mm, when the rolling brush 2 is used, the hard bristle strips 100 and the soft bristle strips 200 cannot be matched with each other, so the spacing range of the grooves for installing the hard bristle strips 100 and the soft bristle strips 200 is set to be 1 mm to 15 mm.

Embodiment 2:

[0039] This embodiment provides a floor brush structure, which differs from the above embodiment in that: as shown in Fig. 4, a plurality of soft bristles 2.3 and a plurality of hard bristles 2.2 are disposed on a surface of one substrate at the same time to form a plurality of soft and hard bristle strips 400, and the soft and hard bristle strips 400 are disposed on a surface of the rolling body 2.1.

[0040] The soft bristles 2.3 and the hard bristles 2.2 are woven with one substrate to form a complete soft and hard bristle strip 400, and then the soft and hard bristle strip 400 is installed on the rolling brush 2.

[0041] In the above Embodiment 2, in the soft and hard bristle strips 400, the plurality of hard bristles 2.2 are arranged on the substrate to form a hard bristle layer 500, the plurality of soft bristles 2.3 are arranged on the surface of the substrate to form a soft bristle layer 600, and the hard bristle layer 500 and the soft bristle layer 600 are disposed in parallel.

[0042] On the soft and hard bristle strips 400, all the hard bristles 2.2 are arranged to form a hard bristle layer 500, all the soft bristles 600 are arranged to form a soft bristle layer 600, and the soft bristle layer 600 and the hard bristle layer 500 are arranged in parallel.

[0043] In the above Embodiment 2, a spacing range between the hard bristle layer 500 and the soft bristle layer 600 is 0 mm to 15 mm.

[0044] When the hard bristle layer 500 and the soft bristle layer 600 are parallelly formed into a brush layer and disposed on the surface of the substrate, there may not or may be a spacing between the hard bristle layer 500 and the soft bristle layer 600, but the spacing between the two cannot exceed 15 mm, and if it exceeds 15 mm, when the rolling brush 2 is used, the hard bristles 2.2 and the soft bristles 2.3 on the bristle strips cannot be matched with each other.

[0045] In the above Embodiment 2, a plurality of second grooves 700 are formed in the surface of the rolling body 2.1, and one soft and hard bristle strip 400 is installed in one second groove 700.

[0046] When the soft and hard bristle strips 400 are installed on the rolling body 2.1, grooves may be formed in the rolling body 2.1, the grooves may be in a V-shape, an inverted V-shape, a spiral shape and the like, and the soft and hard bristle strips 400 may be inserted into the grooves through oblique or direct insertion to complete the installation. At the same time, the grooves may also be omitted, and the soft and hard bristle strips 400 directly adhere to the rolling body 2.1 with glue.

[0047] The above implementations are only intended to illustrate the technical concept and features of the present disclosure, and are intended to let those familiar with the art understand the content of the present disclosure and implement it, which cannot limit the scope of protection of the present disclosure. Any equivalent changes or modifications made according to the spirit of the present disclosure should be included in the scope of protection of the present disclosure.

Claims

1. A floor brush structure, comprising:

a housing;
a rolling brush, comprising a rolling body, hard bristles and soft bristles, wherein
the rolling body is rotatably disposed in the housing, a plurality of hard bristles are disposed on an outer surface of the rolling body, a plurality of soft bristles are disposed on the outer surface of the rolling body, a height of the hard bristles is lower than a height of the soft bristles, and a height difference range of the hard bristles and the soft bristles is 0.2 mm to 5 mm; and
comb teeth, disposed in the housing and corresponding to the rolling brush, wherein when the rolling brush rotates, tooth tips of the comb teeth are able to be inserted into the hard bristles and the soft bristles to comb hairs tangled on the rolling brush, and a depth range of the tooth tips of heads of the comb teeth inserted into the hard bristles and/or the soft bristles is 0.1 mm to 5 mm.

2. The floor brush structure according to claim 1, wherein a plurality of tooth tips of the comb teeth are arranged in an axial direction of the rolling body, a spacing range between two adjacent tooth tips is 2 mm to 6 mm, and an angle range of the tooth tips of the heads of the comb teeth is 8° to 105°.

3. The floor brush structure according to claim 1, wherein the plurality of hard bristles are arranged on a surface of one substrate to form a plurality of hard bristle strips, the plurality of soft bristles are arranged on a surface of one substrate to form a plurality of soft bristle strips, and the hard bristle strips and the soft bristle strips are divided into a plurality of groups of one hard bristle strip and one soft bristle strip to be disposed on a surface of the rolling body.

4. The floor brush structure according to claim 3, wherein a plurality of first grooves are formed in the surface of the rolling body, each first groove is a combined groove with two grooves as one group, one hard bristle strip is installed in one groove, and one soft bristle strip is installed in the other groove.

5. The floor brush structure according to claim 4, wherein a spacing range between the two grooves in the combined groove is 1 mm to 15 mm.

6. The floor brush structure according to claim 1, wherein the plurality of soft bristles and the plurality of hard bristles are disposed on a surface of one substrate at the same time to form a plurality of soft and hard bristle strips, and the soft and hard bristle strips are disposed on a surface of the rolling body.

7. The floor brush structure according to claim 6, wherein in the soft and hard bristle strips, the plurality of hard bristles are arranged on the substrate to form a hard bristle layer, the plurality of soft bristles are arranged on the surface of the substrate to form a soft bristle layer, and the hard bristle layer and the soft bristle layer are disposed in parallel.

8. The floor brush structure according to claim 7, wherein a spacing range between the hard bristle layer and the soft bristle layer is 0 mm to 15 mm.

9. The floor brush structure according to claim 7, wherein a plurality of second grooves are formed in the surface of the rolling body, and one soft and hard bristle strip is installed in one second groove.

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

1. A floor brush structure, comprising: a housing (1);

a rolling brush (2), comprising a rolling body (2.1), hard bristles (2.2) and soft bristles (2.3), wherein the rolling body (2.1) is rotatably disposed in the housing (1), a plurality of hard bristles (2.2) are disposed on an outer surface of the rolling body (2.1), a plurality of soft bristles (2.3) are disposed on the outer surface of the rolling body (2.1), a height of the hard bristles (2.2) is lower than a height of the soft bristles (2.3), and a height difference range of the hard bristles (2.2) and the soft bristles (2.3) is 0.2 mm to 5 mm so that the hard bristles (2.2) is capable of inserting into piles of a carpet to remove dust from gaps of the carpet when the floor brush structure is being used to clean the carpet and the hard bristles (2.3) are not in contact with a surface of a floor when the floor brush structure is being used to clean the floor; and
comb teeth, disposed in the housing (1) and corresponding to the rolling brush (2), the floor brush structure is characterized that,
when the rolling brush (2) rotates, tooth tips of the comb teeth are able to be inserted into the hard bristles (2.2) and the soft bristles (2.3) to comb hairs tangled on the rolling brush (2), and a depth range of the tooth tips of heads of the comb teeth inserted into the hard bristles (2.2) and/or the soft bristles (2.3) is 0.1 mm to 5 mm;
wherein a plurality of groups of first grooves (300) are formed in the surface of the rolling body (2.1), each group of first grooves (300) consists of two grooves, one of the two grooves is configured to install one of the hard bristle strips (100), and another of the two grooves is configured to install one of the soft bristle strips (200); a spacing range between the two grooves in each group of first grooves is 1 mm to 15 mm.

2. The floor brush structure according to claim 1, wherein a plurality of tooth tips of the comb teeth are arranged in an axial direction of the rolling body (2.1), a spacing range between two adjacent tooth tips is 2 mm to 6 mm, and an angle range of the tooth tips of the heads of the comb teeth is 8° to 105°.

3. The floor brush structure according to claim 1, wherein the plurality of hard bristles (2.2) are arranged on a surface of one substrate to form a plurality of hard bristle strips (100), the plurality of soft bristles (2.3) are arranged on a surface of one substrate to form a plurality of soft bristle strips (200), and the hard bristle strips (100) and the soft bristle strips (200) are divided into a plurality of groups of one hard bristle strip (100) and one soft bristle strip (200) to be disposed on a surface of the rolling body (2.1).

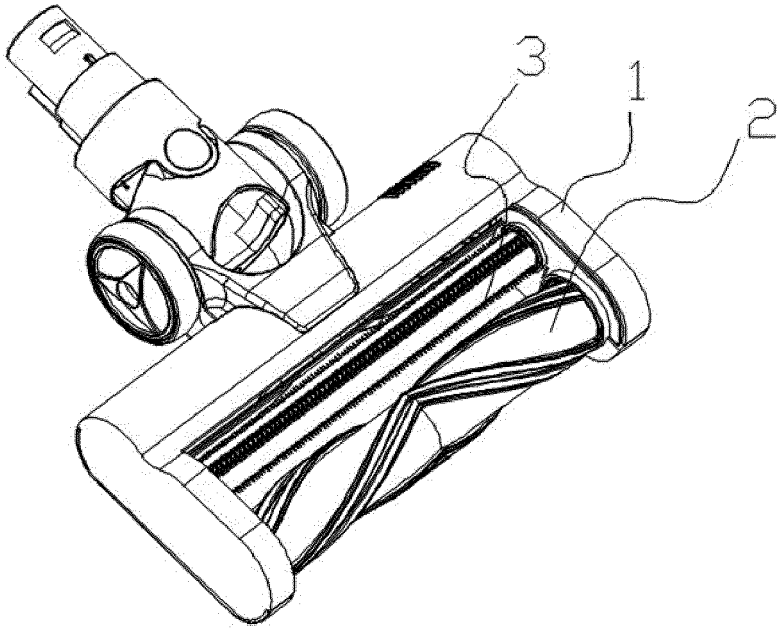

Fig. 1

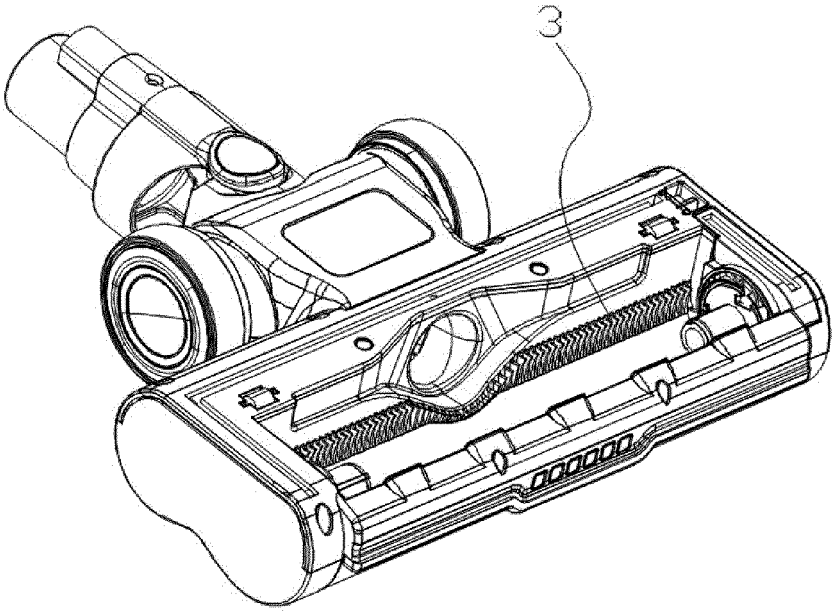

Fig. 2

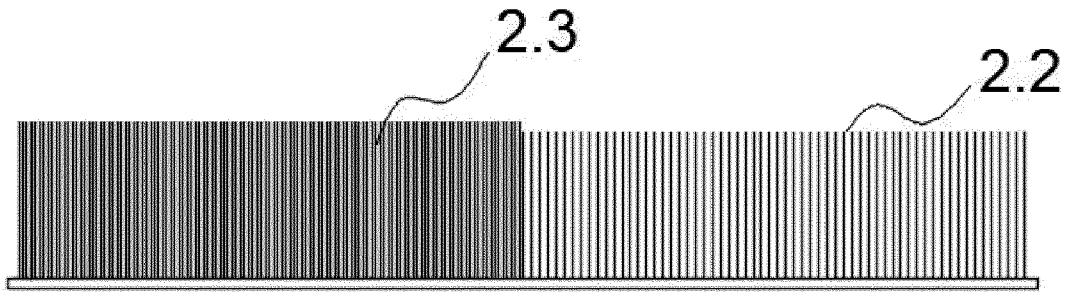

Fig. 3

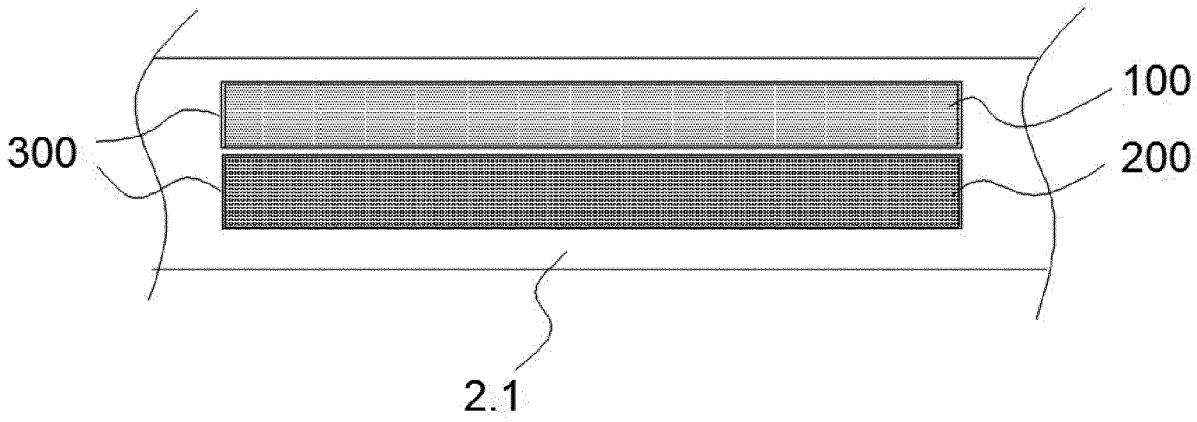

Fig. 4

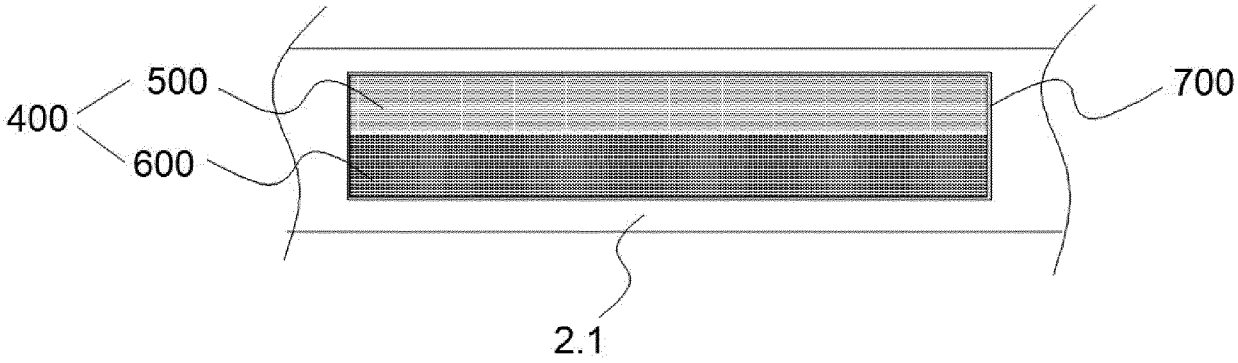

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 23 20 4304

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A46B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	9 April 2024	Kun, Karla

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