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(54) **BRUSH WITH ALTERNATE ROWS OF ANGLED TUFTS**

BÜRSTE MIT ABWECHSELNDEN REIHEN VON ABGEWINKELTEN BÜSCHELN

BROSSE À RANGÉES ALTERNÉES DE TOUFFES INCLINÉES

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Description

[0001] This application claims priority to U.S. Serial No. 61/358,693, entitled BRUSH WITH ALTERNATE ROWS OF ANGLED BRISTLES, filed June 25, 2010.

I. Background

A. Field of Invention

[0002] The present invention relates generally to brushes, and more specifically to brushes having some rows of tufts angled forward and other rows of tufts angled backward.

B. Description of the Related Art

[0003] Numerous types and styles of brushes are known, such as defined in US2005/268414 and WO2007/116115. Typically, brushes include a tuft holder having tufts that extend at right angles from the tuft holder.

[0004] It is also known, as shown in FIGURE 7, to provide a wire brush 200 having a tuft holder 202 with tufts 204, some of which that extend at non-right angles. This known arrangement uses two grouping of tufts 206, 208, where each grouping uses tufts that are splayed or flared, as shown.

[0005] While known brush tuft arrangements generally work well for their intended purposes, what is needed is a brush that provides better performance than known brushes.

II. Summary

[0006] According to this invention, a brush is defined in claim 1. Preferred embodiments are defined in the dependent claims.

[0007] One advantage of this brush is that the angled brushes perform better scrubbing action.

[0008] Still other benefits and advantages of the invention will become apparent to those skilled in the art to which it pertains upon a reading and understanding of the following detailed specification.

III. Brief Description of the Drawings

[0009] The invention may take physical form in certain parts and arrangement of parts, embodiments of which will be described in detail in this specification and illustrated in the accompanying drawings which form a part hereof and wherein:

FIGURE 1 is a side view of a brush, according to one embodiment of the invention.

FIGURE 2 is a perspective side view of the brush shown in FIGURE 1.

FIGURE 3 is a bottom view of the brush shown in FIGURE 1.

FIGURE 4 is an end perspective view of another brush, according to one embodiment of the invention.

FIGURE 5 is a bottom perspective view of the brush shown in FIGURE 4.

FIGURE 5 is a side perspective view of the brush shown in FIGURE 4.

FIGURE 7 is a side perspective view off a prior art wire brush.

IV. Detailed Description of the Invention

[0010] Referring now to the drawings wherein the showings are for purposes of illustrating embodiments of the invention only and not for purposes of limiting the same, and wherein like reference numerals are understood to refer to like components, FIGURES 1-3 show a brush 10 having rows of tufts 30, a tuft holder 40, and a handle 50. A tuft 30 can include one or more filaments or bristles 20. The specific number of filaments or bristles used to make up one tuft 30 can be any number chosen by a person of ordinary skill in the art. The filaments or bristles may be made from a variety of natural materials or fibers or from synthetic materials including, for non-limiting examples, nylon or polyester. For the embodiment shown, the filaments are formed of a relatively stiff metal and thus the brush 10 may be considered to be a wire brush. Wire brushes, as is well known to those of skill in the art, are generally intended for use in scraping undesired materials, such as paint or rust, off of a surface. After the undesired materials are removed, if desired, the now clean surface may be painted, stained or otherwise treated. In one specific embodiment, the bristles 20, and thus the tufts 30, are formed of stainless steel. Each tuft 30 can be secured to the tuft holder 40 with a staple, a wire, a screw, adhesive, epoxy or any other fastening means chosen by a person of ordinary skill in the art. In one embodiment, a handle 50 may extend from the tuft holder 40. In another embodiment, the tuft holder 40 is itself used as a handle. It may have one or more textured regions 52 for this purpose.

[0011] With continuing reference to FIGURES 1-3, the brush 10 may have a primary operation axis 54. The primary operation axis is the axis along which the brush performs best as it is moved over the surface it is being used on. For the embodiment shown, the handle 50 extends from the tuft holder 40 along the primary operation axis 54. The tufts 30 may be arranged in rows 60. The number, type, and shape of rows can be any chosen with the sound judgment of a person of skill in the art. For the embodiment shown, the brush 10 may include five predominately linear rows 60 of tufts 30 with two outside

rows 62, two intermediate rows 64, and one middle row 66. The rows 60 may be parallel to the primary operation axis 54, as shown. The distal end of the two outside rows 62 may have a section that is curvilinear, as shown.

[0012] With reference now to FIGURE 2, to better discuss the orientation of the tufts 30 within the rows 60, note that the nearest outside row 62 is (except the distal portion) within a plane 22 that is parallel to the primary operation axis 54. Note also plane 24 which is perpendicular to the plane 22 and parallel to the primary operation axis 54. Each row similarly is within a plane that is parallel to the primary operation axis 54 and perpendicular to the plane 24. As shown in FIGURE 1, the tufts 30 in the visible outside row 62 are angled at a tuft angle TA1. Tuft angle TA 1 is considered a forward angle because the distal end of the tuft 30 is more forward (toward the distal end of the brush 10) than the base of the tuft 30 (where it extends from the tuft holder 40). The tufts 30 in the visible intermediate row 64 are angled at a tuft angle TA2. Tuft angle TA2 is considered a backward angle because the distal end of the tuft 30 is more backward (toward the proximal, handle end of the brush 10) than the base of the tuft 30 (where it extends from the tuft holder 40). It was discovered that this alternate angled arrangement of the tufts 30 in neighboring rows 60 provides improved performance when the brush 10 is used along its primary operation axis 54. The intermediate and outside rows 64, 62 may, in one embodiment, be similarly angled. Thus in this embodiment the positioning and angling of the tufts 30 are mirror imaged around a longitudinal axis parallel to the primary operation axis 54.

[0013] With reference now to FIGURES 1-3, tuft angles TA 1, TA2 can be any chosen with the sound judgment of a person of skill in the art. Note that the tuft angles are expressed as acute angles. In one embodiment, the tuft angles are between 60 degrees and 87 degrees, inclusively, and in another embodiment, 75 degrees and 87 degrees, inclusively. In still another embodiment, the tuft angles are between 80 degrees and 85 degrees, inclusively. While all the tufts 30 in the outside row 62 are shown to be angled at the same tuft angle TA 1, it is also contemplated to have different tuft angles for the tufts 30 in the outside row 62. Similarly, while all the tufts 30 in the intermediate row 64 are shown to be angled at the same tuft angle TA2, it is also contemplated to have different tuft angles for the tufts 30 in the intermediate row 64. While the tuft angle TA 1 is shown to be at the same angle as the tuft angle TA2, it is also contemplated to have TA1 and TA2 at different angles. If the tufts 30 in neighboring rows 60 are arranged as shown, they form an X-shape when viewed from a position that is perpendicular to the primary operation axis 54 (as shown in FIGURE 1). Of course the spacing and arrangement of the tufts 30 can be such that, in another embodiment, the use of tuft angles TA1 and TA2 do not form an X-shape. The tufts 30 in the middle row 66, may be at right angles with respect to the plane 24. Thus, they are shown to have a tuft angle of 90 degrees. It is also contemplated

to arrange the tufts 30 in the middle row 66 at forward or backward angles.

[0014] With continuing reference to FIGURES 1-3, it is also contemplated to provide one or more of the tufts for any of the rows to have an inward angle (the distal end of the tuft 30 is more toward the inside of the brush 10 than the base of the tuft 30) or an outward angle (the distal end of the tuft 30 is more toward the outside of the brush 10 than the base of the tuft 30) if desired.

[0015] With reference now to FIGURES 4-6, another embodiment brush 10 is shown. This brush 10 includes tufts 30 arranged in rows 60. The brush 10 may include an outside row 70, which can extend around at least a portion of the perimeter of the tuft holder 40. The brush 10 may include an inside row 72 positioned adjacent the outside row 70. The outside row 70 may angle out at between 75 degrees and 85 degrees inclusively measured from a horizontal plane on the tuft holder 40. In a specific embodiment, the outside row 70 may angle out at approximately 82.5 degrees. The intermediate row 72 may angle out at between 75 degrees and 89 degrees inclusively measured from a horizontal plane on the tuft holder 40. In a specific embodiment, the outside row 70 may angle out at approximately 86.2 degrees.

[0016] With continuing reference to FIGURES 4-6, the brush 10 may include a center field of rows 74 adjacent the inside row 72. The center field 74 may include one or more rows 60 of tufts 30. The rows 60 may extend along the longitudinal axis of the brush 10, along the transverse axis of the brush 10, or any direction including, but not limited to, diagonal. The tufts 30 may be arranged so the rows 60 extend along two axes, for one non-limiting example, along both the longitudinal and transverse axes. In one embodiment, the center field includes nine rows 60 of tufts 30. One row 60 is angled towards a first end 16 of the brush 10 and the adjacent row 60 is angled towards a second end 18 of the brush. In one specific embodiment, the center field 74 includes nine rows 60 with the first, third, fifth, seventh, and ninth rows 60 angled approximately 81 degrees toward the first end 16, measured from a horizontal plane on the tuft holder 40; and the second, fourth, sixth, and eighth rows 60 angled approximately 81 degrees toward the second end 18, measured from a horizontal plane on the tuft holder 40.

[0017] With reference now to all the FIGURES, many variations of the brushes 10, 10 are contemplated with some variations including a layout of adjacent rows of tufts angled in alternate directions. Within each row 60, the tufts 30 can be substantially parallel to each other or the tufts 30 may have various other configurations. For one non-limiting example, the tufts 30 within a row 60 may all be angled towards the front 16 of the brush, but at different angles. For another non-limiting example, the tufts 30 may all be angled towards the front 16 of the brush and one side of the brush at substantially the same angle. For another non-limiting example, the tufts 30 may all be angled towards the rear 18 of the brush at substantially the same angle, but at different angles to the sides

of the brush. A first row 60 may have many different configurations, and an adjacent second row 60 may have a mirror configuration of the first row 60. The second adjacent row may be substantially parallel to the first row or the adjacent row may be offset at an angle to the first row.

Claims

1. A brush (10) comprising:

a tuft holder (40);
 a primary operation axis (54);
 a first row (60) of tufts (30) that comprises at least first and second tufts that extend from the tuft holder (40);
 a second row (60) of tufts (30) that comprises at least first and second tufts that extend from the tuft holder;
 wherein the first and second row of tufts are substantially parallel to the primary operation axis;
 wherein the first tuft of the first row and the first tuft of the second row form an X-shape when viewed from a position that is perpendicular to the primary operation axis; and,
 wherein the second tuft of the first row and the second tuft of the second row form an X-shape when viewed from a position that is perpendicular to the primary operation axis,
 wherein the first and second tufts in the first row and the first and second tufts in the second row are formed of stainless steel.

2. The brush of claim 1 further comprising:

a third row of tufts that: is substantially parallel to the primary operation axis; and, comprises at least first and second tufts; and,
 wherein each tuft in the third row: extends from the tuft holder; and, is angled at a right tuft angle within a first plane (22) that is parallel to the primary operation axis and with respect to a second plane (24) that is perpendicular to the first plane and parallel to the primary operation axis;
 wherein the right tuft angle is substantially 90 degrees.

3. The brush of claim 2 further comprising:

a fourth row (60) of tufts (30) that comprises at least first and second tufts that extend from the tuft holder;
 a fifth row (60) of tufts (30) that comprises at least first and second tufts that extend from the tuft holder;
 wherein the fourth and fifth row of tufts are substantially parallel to the primary operation axis;

wherein the first tuft of the fourth row and the first tuft of the fifth row form an X-shape when viewed from a position that is perpendicular to the primary operation axis; and,
 wherein the second tuft of the fourth row and the second tuft of the fifth row form an X-shape when viewed from a position that is perpendicular to the primary operation axis.

4. The brush of claim 3 wherein:

the first, second, third, fourth and fifth rows of tufts are positioned from a first side of the tuft holder to a second side of the tuft holder in the following order: the first row; the second row; the third row; the fourth row; and, the fifth row.

5. The brush of claim 4 wherein:

the first and second tufts of the first row and the first and second tufts of the fifth row have a forward acute tuft angle; and,
 the first and second tufts of the second row and the first and second tufts of the fourth row have a backward acute tuft angle.

Patentansprüche

1. Bürste (10), umfassend:

einen Büschelhalter (40);
 eine primäre Betriebsachse (54);
 eine erste Reihe (60) von Büscheln (30), die mindestens ein erstes und ein zweites Büschel, die sich von dem Büschelhalter (40) erstrecken, umfasst;
 eine zweite Reihe (60) von Büscheln (30), die mindestens ein erstes und ein zweites Büschel, die sich von dem Büschelhalter erstrecken, umfasst;
 wobei die erste und die zweite Reihe von Büscheln im Wesentlichen parallel zu der primären Betriebsachse sind;
 wobei das erste Büschel der ersten Reihe und das erste Büschel der zweiten Reihe eine X-Form ausbilden, wenn sie von einer Position, die senkrecht zu der primären Betriebsachse ist, betrachtet werden; und
 wobei das zweite Büschel der ersten Reihe und das zweite Büschel der zweiten Reihe eine X-Form ausbilden, wenn sie von einer Position, die senkrecht zu der primären Betriebsachse ist, betrachtet werden,
 wobei das erste und das zweite Büschel in der ersten Reihe und das erste und das zweite Büschel in der zweiten Reihe aus Edelstahl ausgebildet sind.

2. Bürste nach Anspruch 1, ferner umfassend:

- eine dritte Reihe von Büscheln, die: im Wesentlichen parallel zu der primären Betriebsachse ist; und mindestens ein erstes und ein zweites Büschel umfasst; und
- wobei sich jedes Büschel in der dritten Reihe: von dem Büschelhalter erstreckt; und in einem rechten Büschelwinkel innerhalb einer ersten Ebene (22), die parallel zu der primären Betriebsachse ist, und hinsichtlich einer zweiten Ebene (24), die senkrecht zu der ersten Ebene und parallel zu der primären Betriebsachse ist, winkelig ist; wobei der rechte Büschelwinkel im Wesentlichen 90 Grad beträgt.
3. Bürste nach Anspruch 2, ferner umfassend:
- eine vierte Reihe (60) von Büscheln (30), die mindestens ein erstes und ein zweites Büschel, die sich von dem Büschelhalter erstrecken, umfasst;
- eine fünfte Reihe (60) von Büscheln (30), die mindestens ein erstes und ein zweites Büschel, die sich von dem Büschelhalter erstrecken, umfasst;
- wobei die vierte und die fünfte Reihe von Büscheln im Wesentlichen parallel zu der primären Betriebsachse sind;
- wobei das erste Büschel der vierten Reihe und das erste Büschel der fünften Reihe eine X-Form ausbilden, wenn sie von einer Position, die senkrecht zu der primären Betriebsachse ist, betrachtet werden; und
- wobei das zweite Büschel der vierten Reihe und das zweite Büschel der fünften Reihe eine X-Form ausbilden, wenn sie von einer Position, die senkrecht zu der primären Betriebsachse ist, betrachtet werden.
4. Bürste nach Anspruch 3, wobei:
- die erste, die zweite, die dritte, die vierte und die fünfte Reihe von Büscheln von einer ersten Seite des Büschelhalters zu einer zweiten Seite des Büschelhalters in der folgenden Reihenfolge positioniert sind: die erste Reihe; die zweite Reihe; die dritte Reihe; die vierte Reihe; und die fünfte Reihe.
5. Bürste nach Anspruch 4, wobei:
- das erste und das zweite Büschel der ersten Reihe und das erste und das zweite Büschel der fünften Reihe einen spitzen Büschelwinkel nach vorn aufweisen; und
- das erste und das zweite Büschel der zweiten Reihe und das erste und das zweite Büschel der vierten Reihe einen spitzen Büschelwinkel nach hinten aufweisen.

Revendications

1. Brosse (10) comprenant :

- un support de touffe (40) ;
- un axe fonctionnel primaire (54) ;
- une première rangée (60) de touffes (30) qui comprend au moins des première et seconde touffes qui s'étendent à partir du support de touffe (40) ;
- une deuxième rangée (60) de touffes (30) qui comprend au moins des première et seconde touffes qui s'étendent à partir du support de touffe ;
- dans laquelle les première et deuxième rangées de touffes sont sensiblement parallèles à l'axe fonctionnel primaire ;
- dans laquelle la première touffe de la première rangée et la première touffe de la deuxième rangée présentent une forme de X lorsqu'elles sont vues depuis une position qui est perpendiculaire à l'axe fonctionnel primaire ; et,
- dans laquelle la seconde touffe de la première rangée et la seconde touffe de la deuxième rangée présentent une forme de X lorsqu'elles sont vues depuis une position qui est perpendiculaire à l'axe fonctionnel primaire,
- dans lequel les première et seconde touffes dans la première rangée et les première et seconde touffes dans la deuxième rangée sont formées d'acier inoxydable.

2. Brosse selon la revendication 1 comprenant en outre :

- une troisième rangée de touffes qui : est sensiblement parallèle à l'axe fonctionnel primaire ; et, comprend au moins des première et seconde touffes ; et,
- dans laquelle chaque touffe dans la troisième rangée : s'étend à partir du support de touffe ; et, est inclinée selon un angle droit de touffe au sein d'un premier plan (22) qui est parallèle à l'axe fonctionnel primaire et par rapport à un second plan (24) qui est perpendiculaire au premier plan et parallèle à l'axe fonctionnel primaire ; dans laquelle l'angle droit de touffe est sensiblement de 90 degrés.

3. Brosse selon la revendication 2 comprenant en outre :

- une quatrième rangée (60) de touffes (30) qui comprend au moins des première et seconde touffes qui s'étendent à partir du support de touffe ;
- une cinquième rangée (60) de touffes (30) qui comprend au moins des première et seconde

touffes qui s'étendent à partir du support de touffe ;

dans laquelle les quatrième et cinquième rangées de touffes sont sensiblement parallèles à l'axe fonctionnel primaire ;

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dans laquelle la première touffe de la quatrième rangée et la première touffe de la cinquième rangée présentent une forme de X lorsqu'elles sont vues depuis une position qui est perpendiculaire à l'axe fonctionnel primaire ; et,

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dans laquelle la seconde touffe de la quatrième rangée et la seconde touffe de la cinquième rangée présentent une forme de X lorsqu'elles sont vues depuis une position qui est perpendiculaire à l'axe fonctionnel primaire.

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4. Brosse selon la revendication 3 dans laquelle :

les première, deuxième, troisième, quatrième et cinquième rangées de touffes sont positionnées d'un premier côté du support de touffe à un second côté du support de touffe dans l'ordre suivant : la première rangée ; la deuxième rangée ; la troisième rangée ; la quatrième rangée ; et, la cinquième rangée.

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5. Brosse selon la revendication 4 dans laquelle :

les première et seconde touffes de la première rangée et les première et seconde touffes de la cinquième rangée ont un angle de touffe aigu vers l'avant ; et,

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les première et seconde touffes de la deuxième rangée et les première et seconde touffes de la quatrième rangée ont un angle de touffe aigu vers l'arrière.

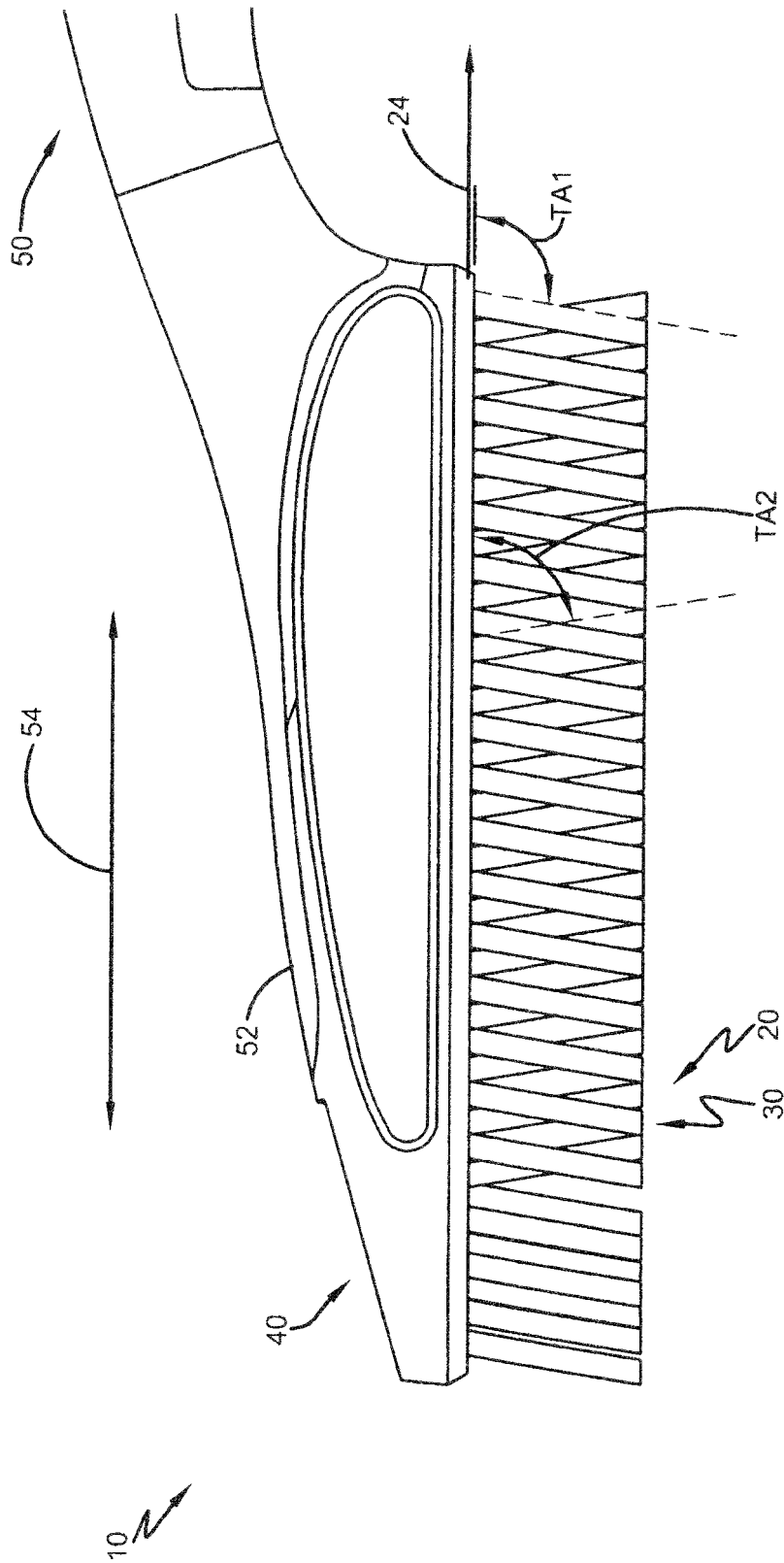
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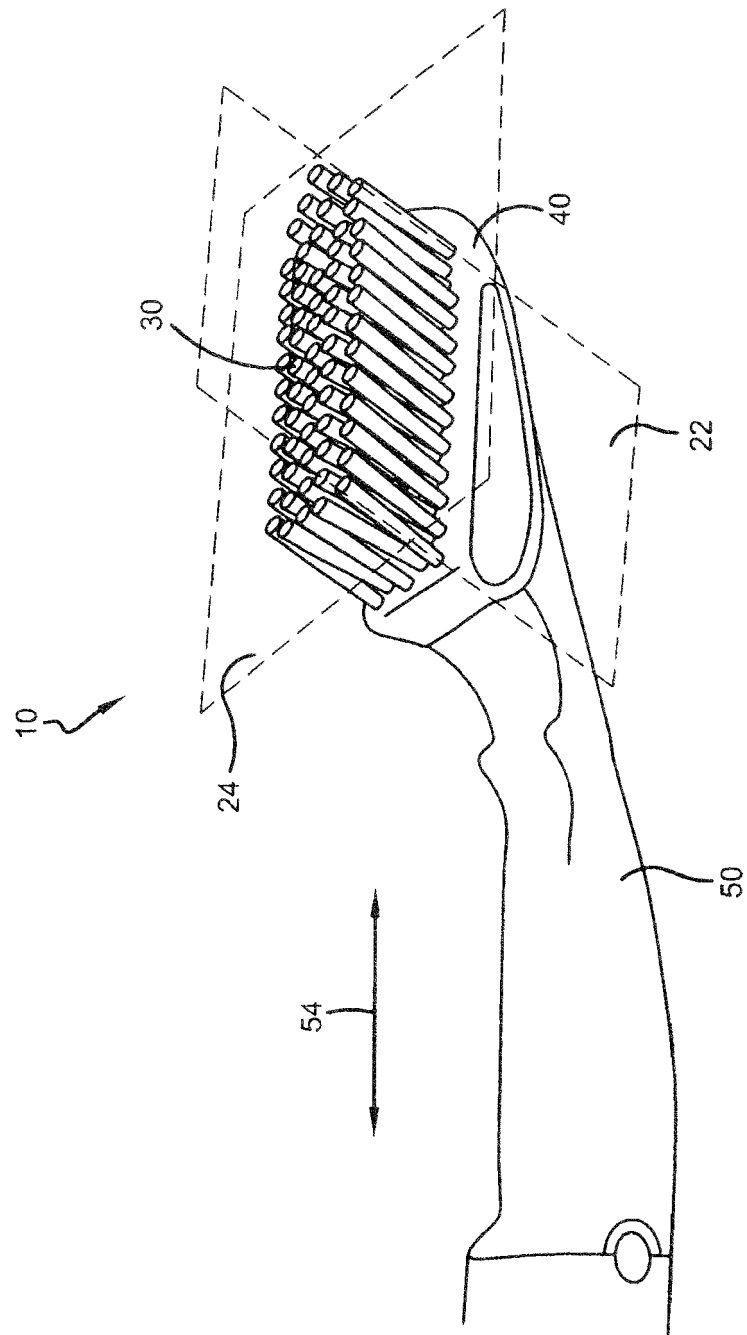


FIG. 2

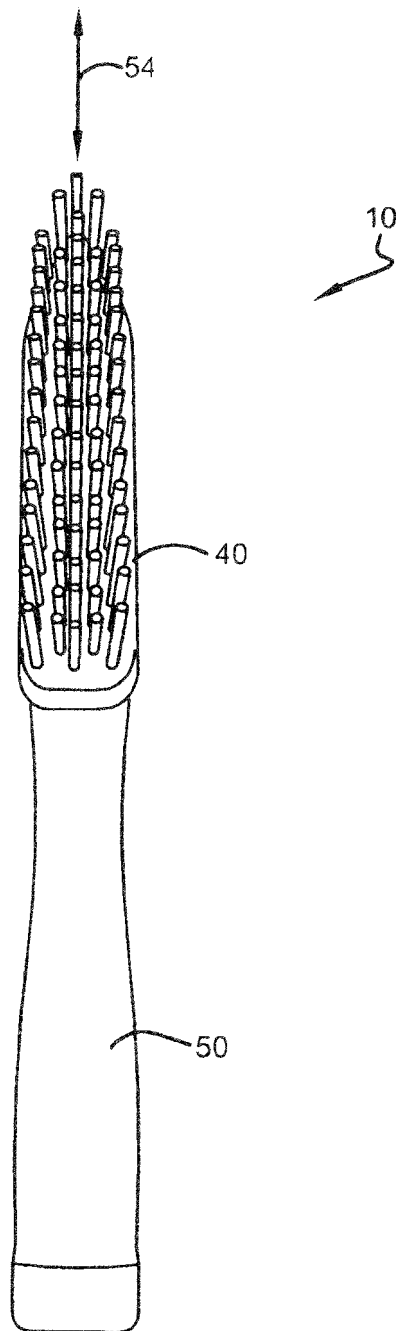


FIG. 3

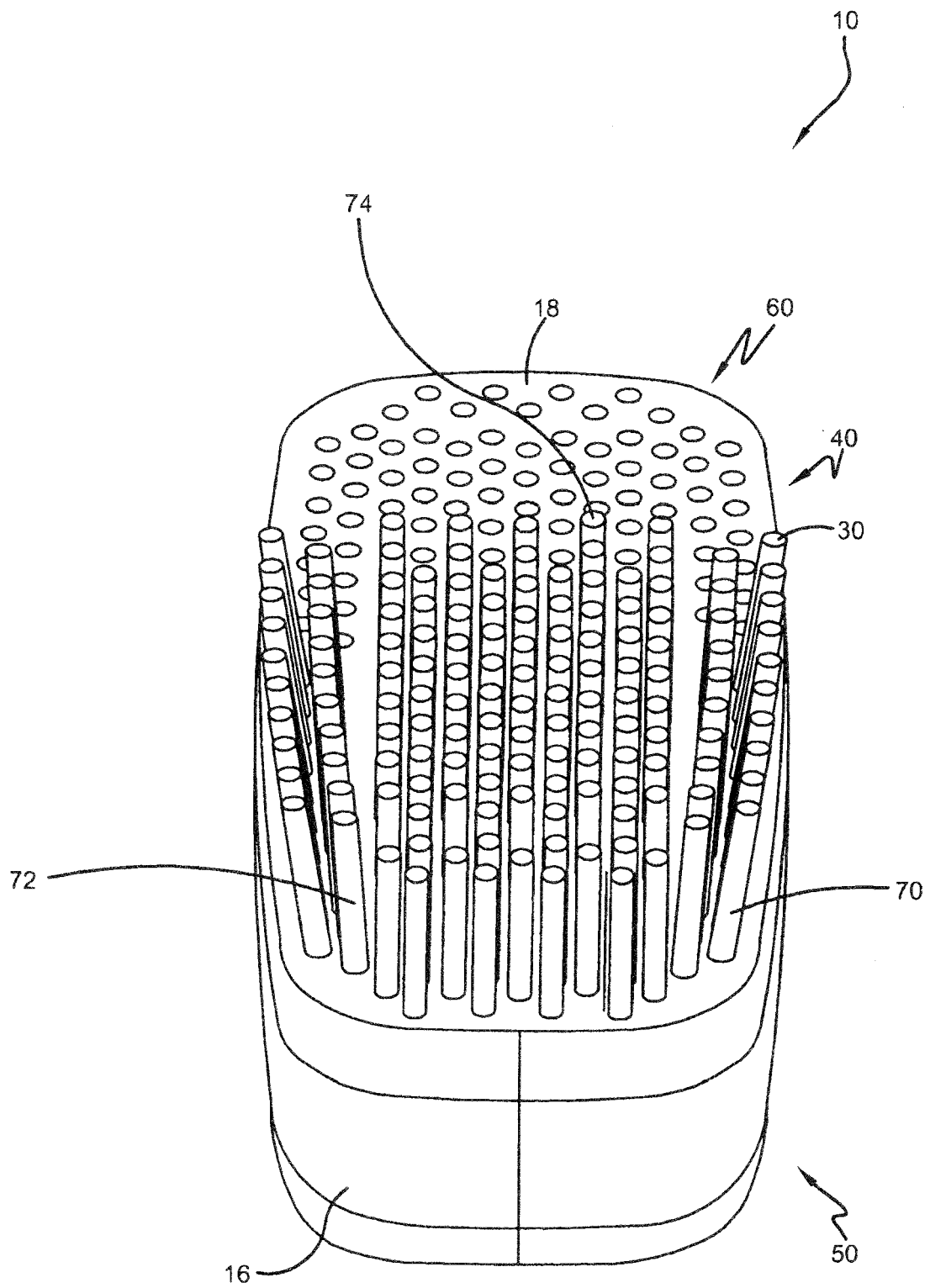


FIG. 4

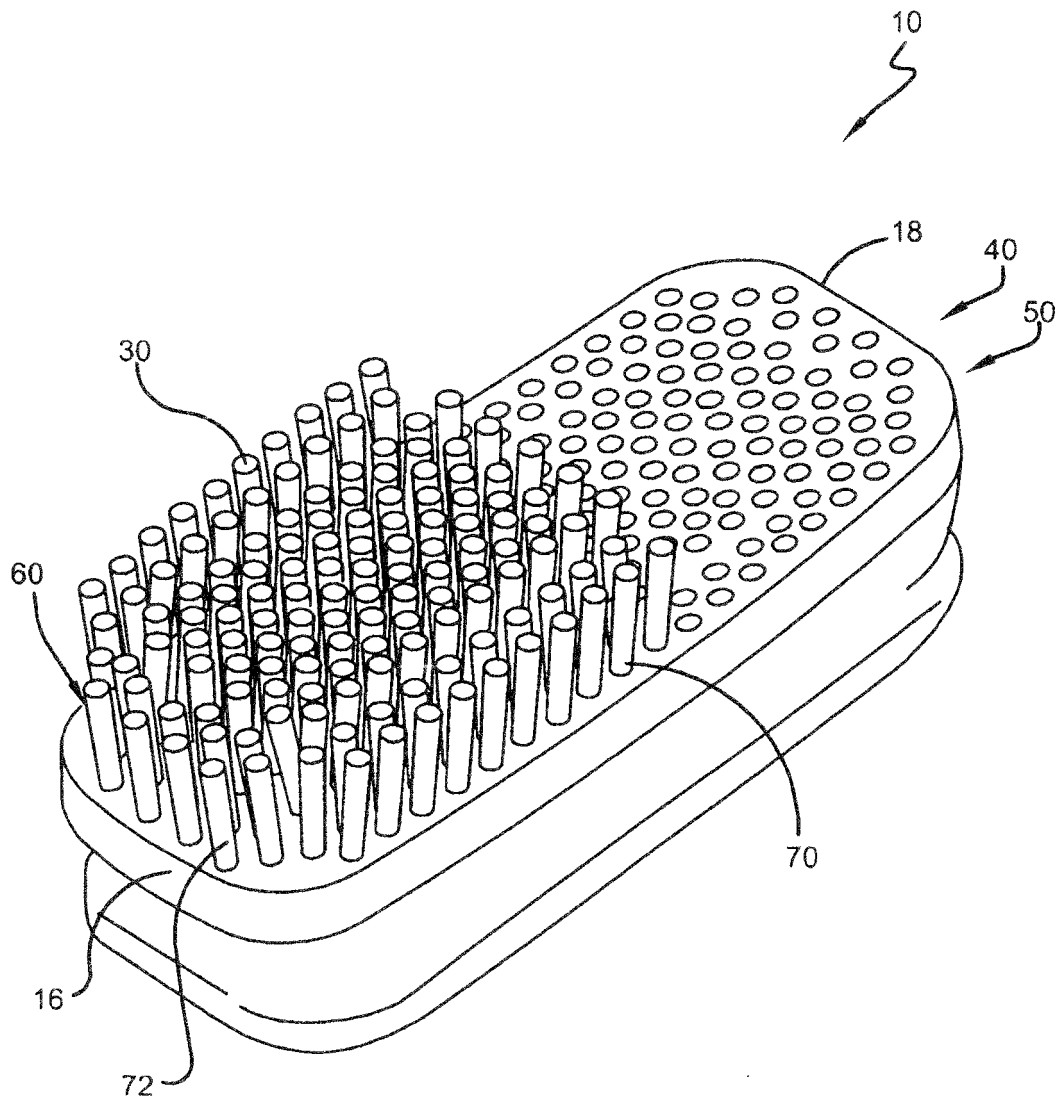


FIG. 5

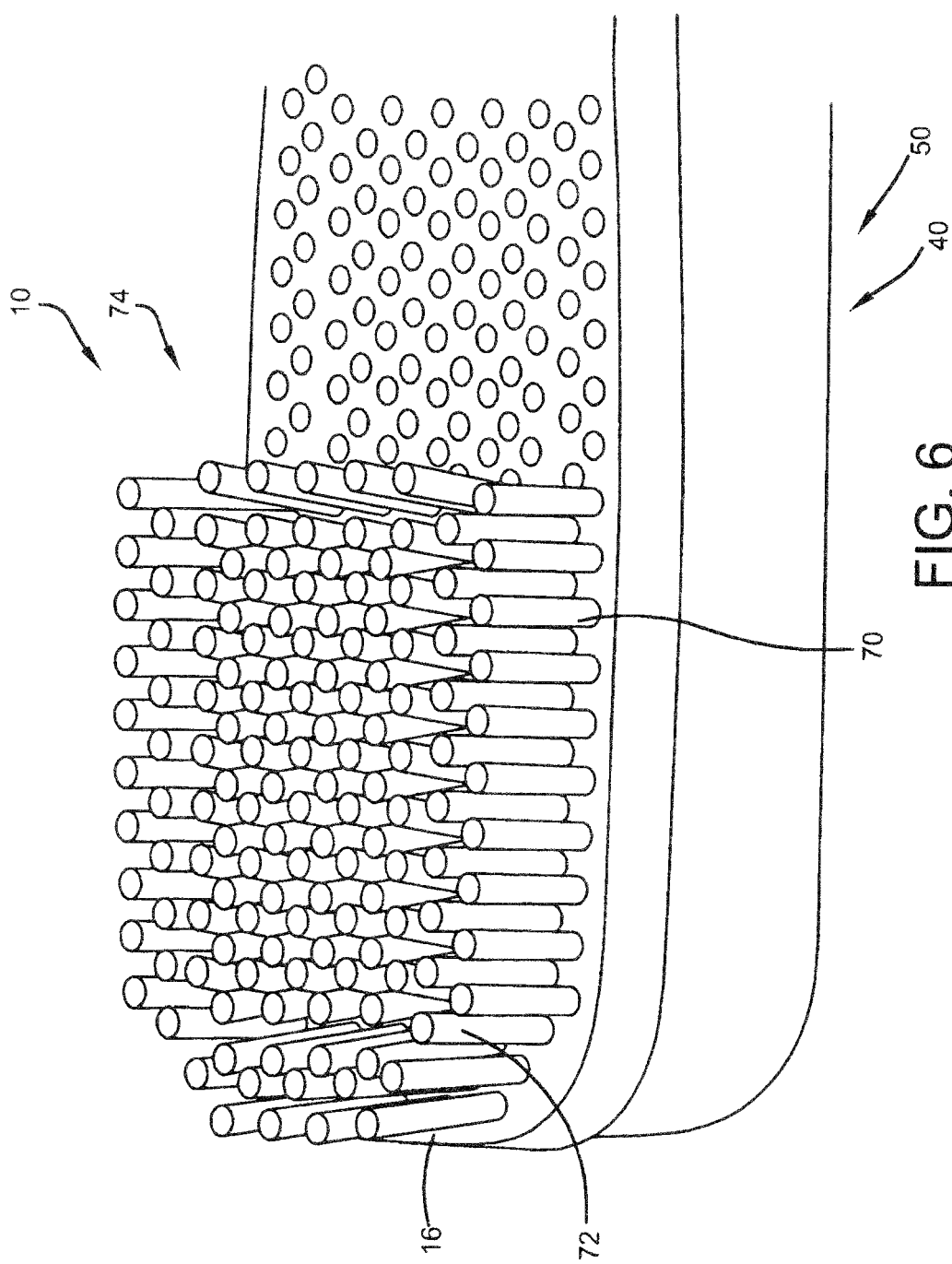


FIG. 6

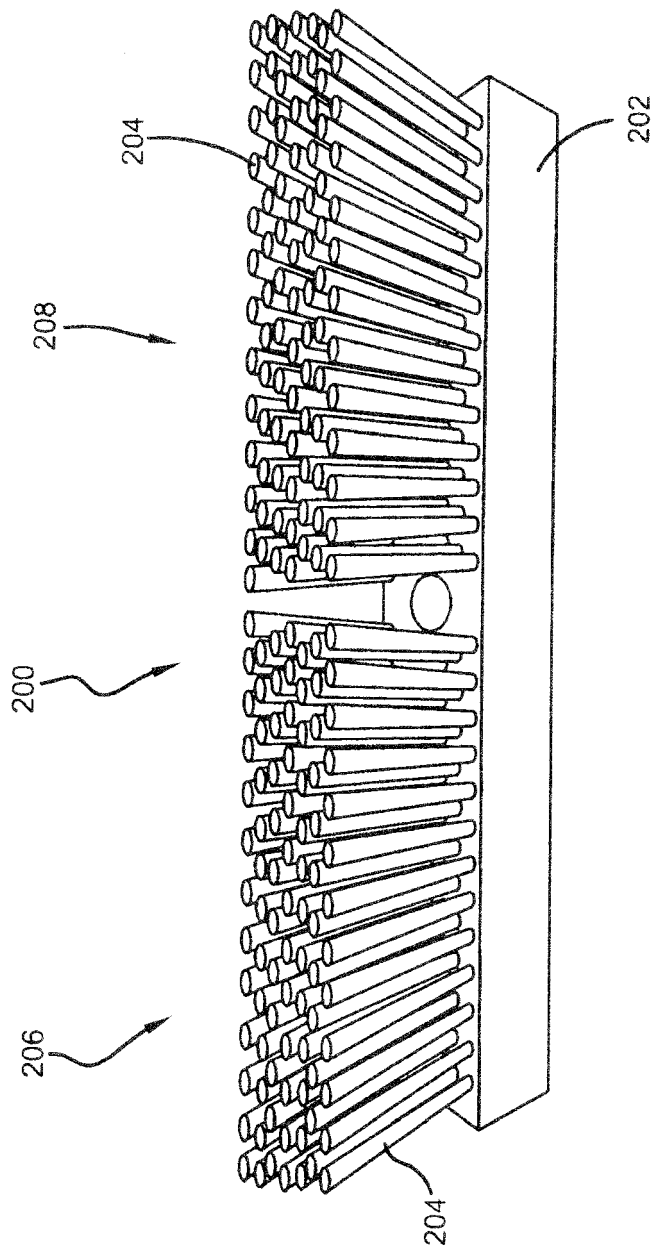


FIG. 7
PRIOR ART

REFERENCES CITED IN THE DESCRIPTION

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