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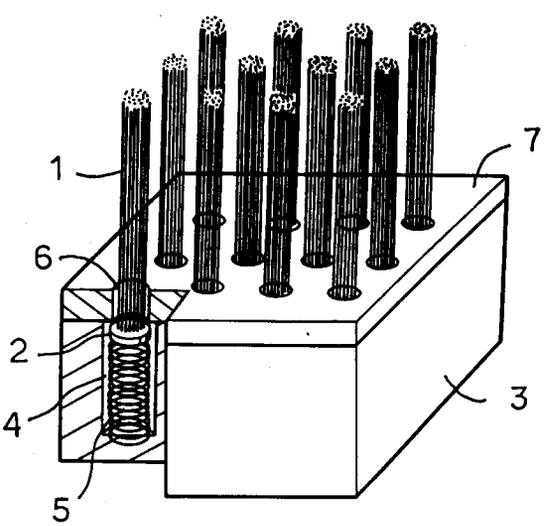
(54) Resilient brush.

(57) There is disclosed a brush having tufts of bristles (1) resiliently movable in compliance with a state of the surface being brushed, resulting in enhanced brushing effidiency and durability. Therefore, the brush can be effectively used in cleaning or polishing of a surface having irregularity. To this end, the brush includes the tufts (1) each comprising a packet of the bristles having a support piece (2) bonded to their lower ends being movably received in each holes (4) formed in a body (3), and springs (5) disposed below each of the support pieces (2) within the holes (4) of the body (3) to normally bias upwardly the support piece (2).

FIG.1



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BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a resilient brush for cleaning or polishing of a surface of an object.

2. Description of the Prior Art

Heretofore known numerous brushes of various forms and designs, such as a toothbrush, a shoe-brush, a clothes-brush, a cleaning brush, a polishing brush, etc., have been made to have stationary bristles anchored into grooves formed in a body.
While such prior brushes can be used in brushing of a flat surface without any trouble, they do not provide satisfactory results when used in brushing of a surface having irregularity. Therefore, in polishing or cleaning operation of the rugged surface, the user used to press the brush against the surface. At this time, if the brush is pressed down to the extent that the bristles are excessively bent, some of the bristles may be easily broken or worn and the friction may be concentrated on the protrusion, not the recess, of the irregularity, resulting in abrasion of only the protrusion.
Especially, the prior toothbrush used in a human tooth having a curved surface rather than a flat surface can not accomplish uniform polishing and cleaning of the tooth's surface and instead be easily worn.

SUMARY OF THE INVENTION

In view of the aforesaid common problem of the prior art brushens, it is an object of the present invention to provide a resilient brush so that even when used in cleaning or polishing operation of a surface having irregularity, it can perform uniform brushing action on all the portions of the rugged surface regardless of a state of the surface.

To achieve the above object, there is provided a resilient brush for cleaning or polishing of a surface of an object, the brush comprising a body having a plurality of blind holes formed therein in a given pattern; a cover formed with guide holes corresponding in number and position to said holes of said body, and bonded to the upper surface of said body; tufts each comprising a packet of bristles extending through each of said guide holes of said cover and having a support piece bonded to their lower ends, the support piece being movably received in each of said holes of said body; and resilient means disposed one below each support pieces within said holes of said body to normally bias upwardly said support pieces having said tufts of the bristles bonded thereto.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described further, by way of example, with reference to the accompanying drawings, in which;

Fig. 1 is a perspective view, partly in cut way, of a resilient brush according to one embodiment of the present invention; and

Fig. 2 is a vertical cross-sectional view of a portion of a brush according to another embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A brush has tufts each comprising a packet of bristles made of any of various materials, for example, natural animal hairs, synthetic resin filaments, metal wires, etc., and arranged in an adequate pattern, depending upon the uses of the brush.

Fig. 1 shows a perspective view, partly in cut way, of a typical brush among the brushes of various kinds and types provided according to the present invention. In the figure, reference numberal 1 designates the tufts of the bristles. Each of the tufts 1 is bonded at its lower end to a generally disk-shaped support piece 2. The brush comprises a body 3 having a plurality of upwardly open blind holes 4 formed therein in a given pattern.. The support pieces 2 each having the tuft of the bristles bonded at its lower end to a generally disk-shaped support piece 2. The brush compises a body 3 having a plurality of upwardly open blind holes 4 formed therein in a given pattern. The support pieces 2 each having the tuft of the bristles bonded thereto are movably received one within each the holes 4 of the body 3, with the bristles extending upwardly. At this time, before the support pieces 2 are disposed within the holes 4, springs 5 for upwardly biasing the support pieces are firstly disposed one within each the holes.

Then, in order to cover the holes 4 of the body and restrict the upward movement of the support pieces 2 by the biasing force of the springs 5 disposed below the support pieces, a cover 7 having a plurality of guide holes 6 formed therein to correspond in number and position of the holes 4 of the body 3 is secured to the inlet sides of the holes, i.e., the upper side of the body. Each of the guide holes 6 has a diameter less than the diameter of the support piece 2.

In this way, as shown in Fig. 1, each of the tufts of the bristles extends outwardly through each of the guide holes 6 formed in the cover 7, with the support piece 2 movably positioned within the hole 4 of the body 3. As a result, the tuft 1 comprising a packet of the bristles may be moved upward and downward in complicance with a state of the sur-

face with which its tip is brought into contact, while being subjected to the elastic force exerted therupon by the spring 5.

Therefore, when external pressure exerted upon the tip of the tuft 1 to retreat the tuft 1 is removed, the retracted tuft 1 returns to its original position by the elastic recovery force of the spring 5.

Although in this embodiment a coil spring is used as the resilient means disposed below the support piece 2 to normally biasing upwardly the support piece, any of various types of springs other than the coil spring can be used for the same purpose.

In addition, spring modulus of the spring is selected to have an adequate value according to the uses of the brush (for example, whether it will be used in cleaning or heavy polishing operating) and the materials of the bristles.

Referring to Fig. 2 showing another embodiment of the present invention the basic construction of the brush according to this embodiment is sustantially the same as that of the previous embodiment with the exception the differently from the construction shown in Fig. 1 in which after disposition of the springs 5 and the tufts 1 of the bristles within the holes 4 of the body 3, the cover 7 is secured to the upper side of the body 3, the brush of this embodiment comprises a body 3 having a plurality of downwardly open cylindrical holes 4a formed therein, and a cover 7a attached to the lower surface of the body 3 to cover 7a the cylindrical holes 4a of the body 3 with the tufts 1 and the springs 5 disposed within the cylindrical holes 4a.

More particulary, each of the holes has a through-hole which is formed centrally of the bottom thereof and through which the tuft of the bristles extends outwardly. The through-hole has a diameter less than the diameter of the support piece. This embodiment is one of the modifications of the brush which may be carried out adequately in accordance with its uses or manufacturing process.

According to the present invention, since the tufts of the bristles are movable upward and downward in compliance with a state of the surface coming into contact with the tips of the tufts, but not fixedly anchored into grooves of the body as in the prior art brushes, the brush can carry out the uniform brushing operation while exerting a constant pressure upon the friction surface, regardless of the state of the irregular surface. Therefore, the uniform cleaning or polishing of the friction surface can be accomplished without abrasion of some of the bristles, or excessive abrasion of the specific portion of the rugged surface.

Taking a toothbrush as an example, the toothbrush to which the present invention is applied may contribute to health of the tooth greatly important to a human being, and has enhanced brushing efficiency, resulting in reduction of time taking to accomplish a satisfactory brushing effect, and prolongation of the service life to the toothbrush.

The present invention can be extensively applied to various kinds of brushes regardless of the materials of the bristles and the uses of the brush, whereby polishing or cleaning of a cubic structure having a very rugged surface may also be satisfactorily accomplished. When the cleaning and polishing of the rugged surface were experimentally carried out by the brush according to the present invention had the enhanced performance about 3 times greater than that of the prior art.

While the invention has been shown and described with particular reference with preferred embodiments thereof, it will be unterstood that variations and modifications may be made therein without departing form the spirit and scope of the invention as definded in the appended claims.

Claims

1. A resilient brush for cleaning or polishing of a surface of an object, the brush comprising:

a body having a plurality of blind holes formed therein in a given pattern;

a cover formed with guide holes corresonding in number and position to said holes of said body, and bonded to the upper surface of said body;

tufts each comprising a packet of bristles extending through each of said guide holes of said cover and having a support piece bonded to their lower ends, the support piece being movably received in each of said holes of said body; and

resilient means disposed one below each support pieces within said holes of said body to normally bias upwardly said support pieces having said tufts of the bristles bonded thereto.

2. A resilient brush as claimed in claim 1, wherein each of said guide holes of said cover have a diameter less than the diameter of said support piece, thereby providing a stopper for said support piece.

3. A resilient brush for cleaning or polishing of a surface of an object, the brush comprising:

a body formed with a plurality of downwardly

open cylindrical holes, each of which has a through-hole of a smaller diameter formed centrally of the bottom thereof;

tufts each comprising a packet of bristles extending through each said through-holes of said body and having a support piece bonded to their lower ends, the support piece being movably received in each of said holes of said body;

a cover bonded to the underside of said body to cover said cylindrical holes of said body; and

resilient means disposed one within each of said cylindrical holes of said body to be interposed between said support pieces and said cover, thereby normally biasing upwardly said support pieces having said tufts of the bristles bonded thereto.

4. A resilient brush as claimed in claim 1 or 3, wherein said resilient means comprises a coil spring.

5. A resilient brush as claimed in claim 1 or 3, wherein said bristles are made of any of natural hairs, synthetic resin filaments and metal wires.

FIG.1

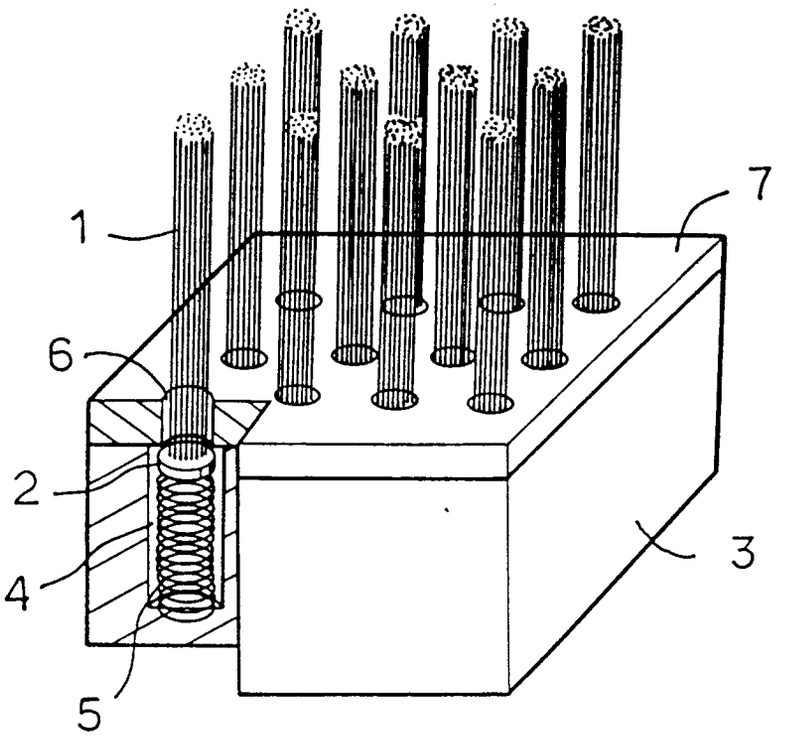
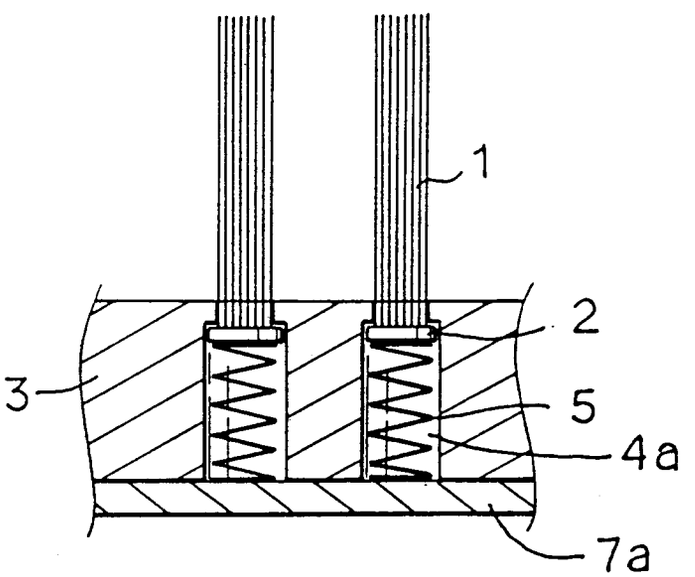


FIG.2



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 10 4805

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-3 082 457 (LUCIBELLO ET AL.) * column 2, line 44 - column 3, line 35; figures * ---	1,2,5	A46B7/06
X Y	EP-A-0 159 940 (LARBORATOIRES PHARMASCIENCE) * claim 1; figures * ---	3 4	
Y	US-A-3 386 118 (MORIOKU) * figure 2 * -----	4	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A46B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	10 JUNE 1992	ERNST R.T.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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