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(72) Inventors:
• **Morris, Philip Michael**
Hertfordshire CM23 1JA (GB)
• **Jacobs, Roger David**
Haverhill, Suffolk CB9 9AD (GB)

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(74) Representative: **Hutchins, Michael Richard et al**
HUGHES CLARK & CO,
114/118 Southampton Row
London WC1B 5AA (GB)

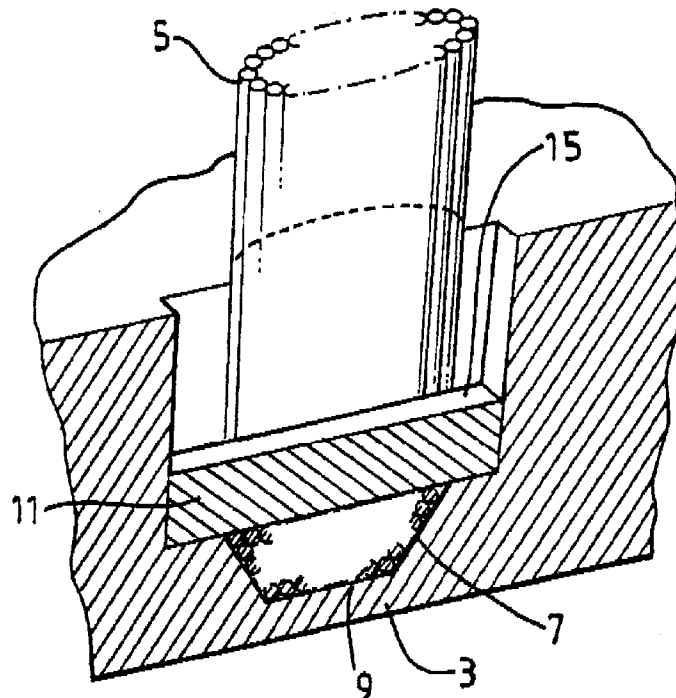
(71) Applicant: **Wisdom Toothbrushes Limited**
Haverhill, Suffolk CB9 8DT (GB)

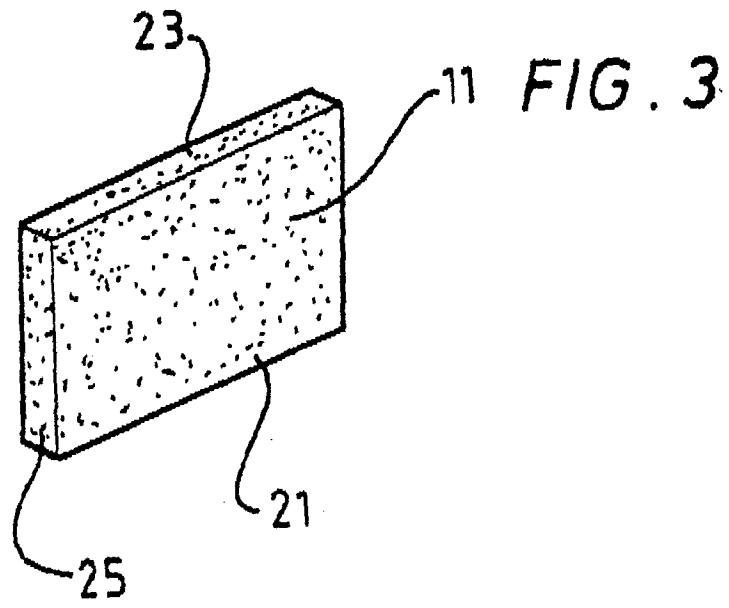
(54) **Brush**

(57) The invention provides a brush comprising a brush head having a plurality of blind holes (7) therein for receiving bristles tufts; a plurality of bristle tufts (5) formed by bundles of bristles folded in two with the folded part (9) located in the holes, and a plurality of staples (11) of a length greater than the width of the holes forced

into the brush head (1) diametrically across the holes and above the bristle fold to retain the bristles in the hole, wherein at least one face of the staple has a surface (21, 23) designed to provide increased friction in the face of the staple and the material of the brush head (1) in which it is embedded.

FIG. 2





Description

[0001] This invention relates to brushes and more particularly to means for attaching the bristles of a brush to the brush head.

[0002] Problems are experienced in retaining the bristle bundle satisfactorily in brushes which use a flat stapling method for their retention.

[0003] In this method, the brush head is formed with a number of circular holes in which the bristles are to be located. The bristles of each tuft of the brush are made in double length and are folded in half so that the fold is inserted in the hole. The bristle tuft is then retained in the hole by means of a flat staple which passes between the halves of the tuft. The staple is positioned diagonally across the hole and forced into the brush head, thus trapping the bristles between the wall and base of the hole and the staple. In order that the staple be retained in the brush head, it has a length longer than the diameter of the hole so that it bites into the material of the brush head on either side of the hole.

[0004] With the staples in use today, in order to maintain adequate retention of the staple, the length of the staple has to extend well beyond the edges of the hole, particularly in brushes in which, in use, the bristles are highly stressed. The length dimension of the staple dictates, to a large extent, the spacing of the bristle tufts from which it follows that the minimum spacing of the bristle tufts can be adversely affected.

[0005] The invention seeks to provide a brush in which the above problem is obviated or significantly reduced.

[0006] Accordingly, in the first aspect, the invention provides a brush head comprising a brush head having a plurality of blind holes therein for receiving bristle tufts; a plurality of bristle tufts formed by bundles of bristles folded in two with the folded part located in the holes, and a plurality of staples of a length greater than the width of the holes forced into the brush head diametrically across the holes and above the bristle fold to retain the bristles in the hole, wherein at least one face of the staple has a surface designed to provide increased friction in the face of the staple and the material of the brush head in which it is embedded.

[0007] The bristle tufts are typically formed from bundles of bristles of double the desired length folded in half with the folded part located in the holes. In this embodiment, the two strands of the folded bristle are of the same length. However, it will be appreciated that there may be circumstances in which it is desired to provide bristles of differing lengths, in which case the fold may be situated so that one strand is longer than the other.

[0008] The staples are typically flat staples having a length greater than the width of the holes.

[0009] The surface of the staple may be roughened, for example, by sand blasting. Alternatively the surface could be formed with corrugations, grooves, ribs or projections.

[0010] The increased friction surface may be provided on one face of the staple, on opposite faces of the staple or on all but the end faces of the staple.

[0011] According to a preferred embodiment of the invention a brush comprises a brush head having a plurality of blind holes therein for receiving bristle tufts, a plurality of bristle tufts formed by bundles of bristles of double the desired length folded in half with the folded part located in the holes and a plurality of flat staples of a length greater than the width of the holes and forced into the brush head diametrically across the holes and above the bristle fold to retain the bristles in the hole wherein at least one face of the staple has a surface designed to provide increased friction between the face of the staple and the material of the brush head in which it is embedded.

[0012] The invention will now be described in greater detail, by way of example, with reference to the drawings, in which:-

Figure 1 is a perspective view of a brush head to which the invention can be applied;

Figure 2 is a sectional view of the brush of figure 1 in the region of one of the bristle tufts showing the fixing of the bristle tuft using a staple;

Figure 3 is a perspective view of a staple having a roughened surface in accordance with one embodiment of the invention;

Figure 4 is a perspective view of a staple having a grooved surface in accordance with another embodiment of the invention; and

Figure 5 is a schematic drawing indicating the basic elements of a machine for treating wire from which the staples are produced.

[0013] Referring to figure 1, there is shown the head 1 of a toothbrush comprising a base portion 3 of suitable plastics material from which protrude a number of bristle tufts 5 located in holes in the base 3.

[0014] Figure 2 shows, in sectional view, the region of the brush head 1 in which one of the bristle tufts 5 is located. The bristle tuft is constructed from a bundle of bristles of twice the required length and these are folded in the middle. They are then inserted in a hole 7 in the base portion 3 with the bend 9 at the inner end.

[0015] A staple 11 is inserted between the bristles 5 diagonally of the hole 7 and pushed downwardly so that it straddles the bend 13 of the bristles. It is then pushed further down so that it is forced into the plastics material on either side of the hole 7 until its upper part 15 is well below the surface of the base portion 3, the friction between the staple 11 and the plastics material of the base 3 holding the staple 11 in place, in which position it traps the bend 13 of the bristles 5 in the hole 7 to prevent their removal therefrom.

[0016] Up to this point, the construction is known. However, the problem exists that in order to have sufficient friction between the staple 11 and the plastics ma-

terial of the base portion 3, it is necessary to have a fairly large part of the staple 11 engaged in the plastics material. This limits the minimum spacing of the bristles 5 and the longer the length of the staple 11, the greater the chance of the base portion splitting during manufacture, thus ruining the brush.

[0017] The present invention seeks to overcome this problem by increasing the friction between the staple 11 and the plastics material. To this end the staple is treated to provide an uneven surface in contact with the plastics material. Figure 3 shows one embodiment of the invention. Here the staple 11 is roughened on its four main faces 21 and 23, i.e. excluding the end faces 25. The reason why the end faces 25 are unroughened will be discussed hereafter.

[0018] Figure 4 shows a second embodiment of the invention. In this case one of the two large main faces 21 of the staple 11 is provided with grooves 31 which extend from one face to the other and into which some of the plastics material of the base portion 3 will be pushed during insertion of the staple 11 into the base portion, thus assisting the staple 11 to remain in place and effectively increasing the friction between that face of the staple 11 and the plastics material.

[0019] It will be appreciated that the above two embodiments show only two examples of many treatments which can be used to increase the friction between the staple 11 and the plastics material. Other possibilities include the formation of ribs, corrugations or projections. Furthermore, any of the surfaces of the staple 11 can be treated so that, for example, in the embodiment of figure 3, only one of the main faces 21 could be treated. In the grooved embodiment of figure 4, both of the main faces 21 could be treated so as to have the grooves 31 on both faces. If desired, the ends 25 of the staple 11 could also be treated though this would make for difficulties in the manufacturing of the staples which are usually produced from a length of flat wire cut to length.

[0020] Figure 5 shows very diagrammatically how the treatment of the wire could take place. The untreated wire 41 which is usually supplied on a reel 43 is fed by any usual method to a treatment station 45. This treatment zone may comprise a sand blasting station in which the wire 41 is treated in a sand blast to roughen its surfaces. In these circumstances, it will be understood that, since the staples have yet to be cut from the wire, the end faces 25 of the staple will not be exposed to the sand blast. With careful control of the speed at which the wire 41 passes through the treatment station 45, the exact amount of roughening desired can be imparted to the wire 41. After passage through the treatment station 45, the wire passes to a take up reel 47 which can then be transported to the brush making machinery for use.

[0021] Where grooves or other patterns are to be formed in the wire, the sand blasting station would be replaced by a station in which rollers, knurls, crimps or other treatment devices are applied to the wire. Other

forms of erosion could be used such as an electrical discharge apparatus for creating spark erosion. Alternatively, etching techniques could be used.

[0022] In the event that the wire itself is specially manufactured, the surface configuration of the wire could be effected by the use of suitably shaped extrusion dies.

[0023] It is to be understood that, while the invention has been described in relation to toothbrushes, it could equally well be applied to other types of brushes such as hairbrushes, clothes brushes and general household brushes.

Claims

1. A brush comprising a brush head having a plurality of blind holes therein for receiving bristle tufts; a plurality of bristle tufts formed by bundles of bristles folded in two with the folded part located in the holes, and a plurality of staples of a length greater than the width of the holes forced into the brush head diametrically across the holes and above the bristle fold to retain the bristles in the hole, wherein at least one face of the staple has a surface designed to provide increased friction in the face of the staple and the material of the brush head in which it is embedded.
2. A brush according to claim 1 wherein each bristle is folded in half to give two portions of equal length.
3. A brush according to claim 1 or claim 2 wherein the staples are substantially flat.
4. A brush according to any one of the preceding claims wherein the surface of the staple is roughened.
5. A brush according to claim 4 wherein the staple has been roughened by sand blasting.
6. A brush according to any one of claims 1 to 4 wherein the surface of the staple is formed with corrugations, grooves, ribs or projections.
7. A brush according to any one of the preceding claims wherein the increased friction surface is provided on only one face of the staple.
8. A brush according to any one of claims 1 to 6 wherein the increased friction surface is provided on opposite faces of the staple.
9. A brush according to any one of claims 1 to 6 wherein the increased friction surface is provided on all but the end faces of the staple.
10. A brush according to any one of the preceding

claims which is a toothbrush.

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FIG. 1

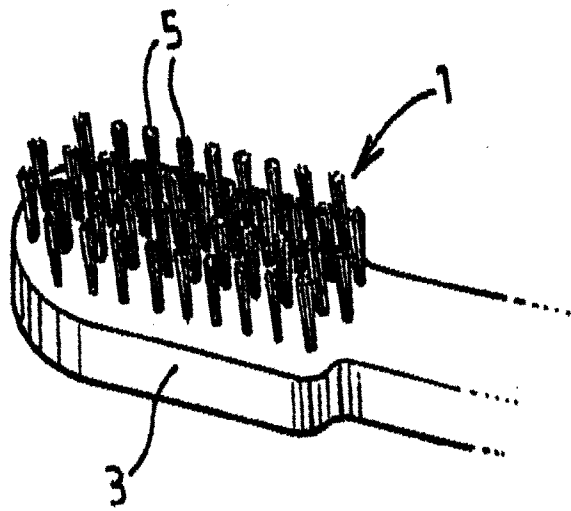


FIG. 2

