METHOD OF BRISTLING A BRUSH SUPPORT


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FIG. 1

FIG. 2

FIG. 3

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METHOD OF BRISTLING A BRUSH SUPPORT

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My invention more particularly relates to a method of bristling a brush in accordance with which subsequent shedding of the bristles is minimized or entirely avoided.

Shedding of the bristles of a brush after a certain amount of use is a common experience, and while it is always annoying it is particularly so when bristles are shed by a tooth brush in the mouth of the user. I have found that the shedding of the bristles of a brush is due almost entirely to the fact that in the ordinary bristling operation a certain number of bristles are sheared off or nearly so, and such bristles are subsequently shed off. In the conventional bristling machine, a bundle of bristles is placed in a recess in the nozzle of the machine where it is engaged by a plunger which folds it and forces the tuft so formed into an opening of the brush support. The maximum diameter of the tuft of bristles is usually greater than that of the opening in which it is inserted. Furthermore, an anchor or staple is usually forced ahead of the plunger on the interior of the tuft which tends to spread the same.

The openings in the brush support, which is usually formed of ebony or other wood, celluloid, bakelite or any other desired substance, are bored leaving sharp edges at the orifices thereof. The tufts of bristles which are usually of a stiff and horny character are thus forced under pressure applied to the interior of the tufts into the openings in a manner tending to spread the same against the sharp edges of walls surrounding the opening at the orifices thereof with the result that some of the bristles, varying in number from one or two up to eighty, or even more, are frequently sheared off in bristling a single brush, or from two to twelve cut bristles in a single tuft. Such bristles are no longer held in the loop in the opening by the anchor or staple but are retained only by friction. In use the bristles are continuously subjected to a bending operation which eventually loosens them and causes them to fall from the brush.

In accordance with my invention a film, preferably in the form of a lubricant, is applied to the tufts of bristles and the portion of the wall of the brush surrounding the opening and forming the orifice thereof. Any desired character of material which reduces the friction between the bristles and the walls around the point of entry may be used. I have found that ordinary cold cream of the U. S. Pharmacopoeia formula is satisfactory for this purpose although any desired material such as wax, oil, grease, soap, jelly or like material may be used. When the material is used in connection with the bristling operation for a tooth brush the material should not have a disagreeable taste or odor.

I have for convenience used the term "bristles" in connection with the material of which the tufts are formed, both in the specification and the claims. This term in the brush art commonly means the hair of a hog. Obviously, when I refer to bristles, I intend to include all equivalents thereof, such, for example, as horse hair, goat hair and other animal hair as well as Tampico and other vegetable fibers.

In the accompanying drawings I have illustrated the parts of a conventional bristling machine suitable for carrying out my invention and equipped in one form with means for applying a protective layer to the bristles. In the drawings—

Fig. 1 is a perspective view of a brush support, partially bristled;

Fig. 2 is a vertical section through the nozzle of a bristling machine and a fragmentary section of a brush support having an opening aligned with the bore of the nozzle;

Fig. 3 is a sectional view illustrating, in perspective, a fragmentary portion of a brush support and an opening therein;

Fig. 4 is a sectional elevation view similar to Fig. 3 illustrating mechanism suitable for applying friction reducing material to the bristles;

Fig. 5 is a side elevation view of Fig. 4; and

Fig. 6 is a perspective detail view of a lubricant container, partially broken away, to illustrate the operating mechanism thereof.

Like reference characters indicate like parts throughout the drawings.

Referring to the drawings and first to Figs. 1 to 3, 10 is a nozzle of a conventional bristling machine provided with a recess 14 in which is placed a bundle of bristles 12, indicated in dotted lines, usually by a transfer mechanism. The nozzle is provided with a longitudinal bore 13. A plunger 14 engages the bundle of bristles 12 at an intermediate portion thereof and in forcing it into the bore 13 folds it as indicated in full lines in the lower portion of the nozzle. The plunger usually forces a staple or anchor, as illustrated at 16, ahead of the same and pressure is thus applied to the inner portion of the tuft, and the anchor or staple as well as the plunger tends to spread the two portions of the fold of the bristles apart. It will be understood, however, that my invention is applicable to the insertion of bristle tufts that are secured in their openings in any desired manner.
The bristle support 16, which is here shown as the head of a tooth brush, is provided with openings 11 which are bored in the support leaving shoulders as at 18.

In accordance with one method of carrying out my invention, a layer of friction reducing material 19 is first applied to the portion of the wall surrounding the opening and forming the orifice thereof. This material may be applied over the inner surface of the bristle support, with a brush or other object and a sufficient amount of material is thereby applied to the portion of the wall surrounding the opening at the orifice thereof to form a protective layer, as indicated at 19. Then, when the tuft of bristles is forced into its opening in the usual manner, a protective layer is interposed between the tuft of bristles and the point of contact at the orifice of the opening which reduces the friction between the parts and thereby minimizes or entirely prevents shearing of the bristles and subsequent shedding thereof in use.

In accordance with another method of carrying out my invention, the layer of friction reducing material is applied directly to the tuft of bristles, preferably prior to its insertion in an opening in a brush support. In Figs. 4, 5 and 6, I have shown appropriate means for carrying out the invention in this manner. Two cylinders 20 are provided which are preferably secured to and carried by the nozzle 10. These cylinders are charged through capped openings 201 with a friction reducing material of the character heretofore indicated which is forced through pipes 21 and the openings 10 and in the nozzle 10 with which the pipes 21 communicate. The openings 22 communicate with grooves 131 which extend partially around the vertically extending passage way 13 of the nozzle 10. The lubricant is forced from the cylinders 20 by pistons 22 which are slideably mounted therein and preferably prevented from rotary movement. The pistons 23 are provided with threaded openings through which stems 24 may be threaded, one end of the stems 24 passing through suitable packing glands and extending outwardly from the cylinders 20. Each of the wheels 25 are suitably keyed to the stems 24 and are adapted to be actuated by pawls 26. The pawls 26 are preferably secured as at 27 to some stationary part of the bristling machine so that when the nozzle 10 descends the ratchet wheels 25 engage the pawls and are rotated thereby, the rotation of the stems 24 causing the pistons 23, which are threaded thereon, to move longitudinally of the cylinders whereby a lubricant is forced therefrom. The lubricant flows downwardly through the pipes 21 and openings 22 to the grooves 131 where it is wiped off by the descending tufts of bristles.

I have found by actual tests that the use of my invention generally eliminates altogether the difficulty of shedding the bristles and in every case the difficulty has been minimized and greatly lessened as compared with the ordinary bristling machine. For example, where twelve to eighty bristles have been shed from a brush, my invention, when used on the same machine and under the same conditions, has reduced the number to one or two or to none at all. In the case of a tooth brush having twenty-five tufts of bristles, if the cut bristles varied from none at all to one or two, it would mean that the bristles of all of the tufts or at least twenty-three or twenty-four thereof would be uncut.

While I have illustrated my invention in connection with a tooth brush, it will be understood that it is equally applicable to hair brushes, clothes brushes and any other brushes where a similar bristling operation is at hand.

While I have illustrated my invention in its preferred embodiment, it is to be understood that the words which I have used are words of description rather than of limitation and that changes within the purview of the appended claims may be made without departing from the true scope and spirit of my invention in its broader aspects.

What I claim is:

1. The step in the method of inserting a tuft of bristles in the opening of a bristle support which comprises applying a film of lubricating material between the portion of the wall forming the orifice of said opening and the tuft of bristles during the insertion of the latter in said opening.

2. The step in the method of inserting a tuft of bristles in the opening of a bristle support which comprises surrounding the portion of the tuft of bristles entering the opening with a layer of lubricating material while being inserted in the opening.

3. The method of bristling a brush support provided with openings which comprises inserting tufts of bristles in said openings under pressure and lubricating the portions of the walls forming the orifices of said openings and the tufts of bristles while the latter are being inserted.

4. The method of bristling a brush support provided with openings which comprises applying a film of lubricating material to the portions of the walls surrounding the openings and forming the orifices thereof, and then forcibly inserting the tufts of bristles in said openings.

5. The method of bristling an opening in a brush support which comprises folding a bundle of bristles to form a tuft, forcibly inserting said tuft in said opening and preventing shearing of the bristles by applying a film of lubricating material between the tuft of bristles and the portion of the wall surrounding said opening and forming the orifice thereof.

6. The method of bristling an opening in a brush support which comprises folding a bundle of bristles to form a tuft, inserting said tuft in said opening by applying pressure to the folded portion of the tuft on the inner portion thereof, and preventing shearing of the bristles by applying a lubricant between the tuft of bristles and the portion of the wall surrounding said opening which forms the orifice thereof.

7. The method of bristling an opening in a brush support which comprises folding a bundle of bristles to form a tuft having a maximum diameter greater than that of the opening in the brush support, forcibly inserting said tuft in said opening and preventing shearing of the bristles by applying a film of lubricating material between the tuft of bristles and the portion of the wall surrounding said opening and forming the orifice thereof.

8. The method of bristling a brush support provided with an opening, the step which comprises applying a film of lubricating material between the tuft of bristles and the contact area of the walls surrounding the opening in the bristle support while the tuft is being inserted.
9. The method of bristling a brush support provided with openings which comprises applying a protective layer of lubricating material to the walls surrounding said openings which are contacted by the bristles and then forcing tufts of bristles into said openings under pressure.

10. The method of preventing the shearing of bristles while inserting tufts thereof in openings of a brush support under conditions tending to shear the bristles which comprises applying a layer of lubricating material between the tufts and the contact area of the walls surrounding the openings while the bristles are being inserted.

11. The method of preventing the shearing of bristles while inserting tufts thereof in openings of a brush support under conditions tending to shear the bristles which comprises applying a layer of lubricating material to the portions of the walls surrounding the openings which are contacted by the bristles, and then forcing tufts of bristles into the openings under pressure.

12. The method of preventing shearing of bristles while inserting tufts thereof in openings of a brush support under conditions tending to shear the bristles which comprises applying a lubricating material to the bristles prior to their insertion into their respective openings.

13. The method of bristling a brush support provided with an opening which comprises applying lubricating material to a tuft of bristles and then forcing the same into an opening in the brush support.

14. The method of bristling an opening in a brush support which comprises lubricating the outer surface of a tuft of bristles and inserting the same in said opening.

15. The method of bristling a brush support provided with a plurality of openings for the reception of tufts of bristles which comprises interposing a film of lubricating material between the walls of the support surrounding the orifices of the openings and the tufts of bristles with a film of lubricating material during the bristling operation.

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