June 9, 1936. J. A. MALCOLM 2,043,898

TOOTH BRUSH

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FIG. 1.

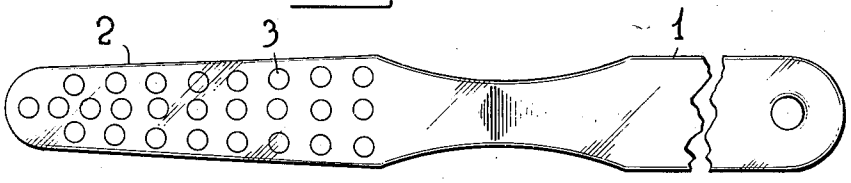


FIG. 2.

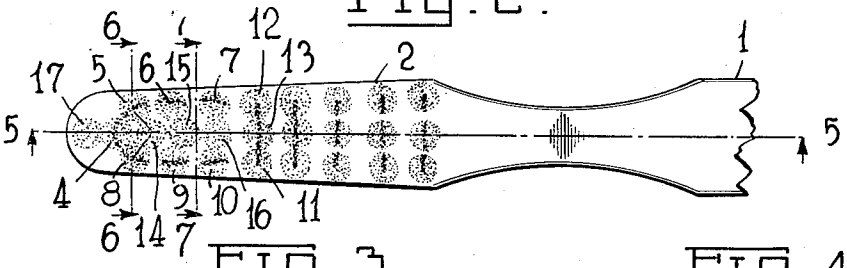


FIG. 3.

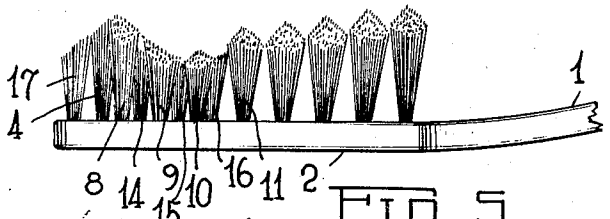


FIG. 4.

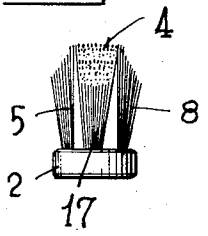


FIG. 5.

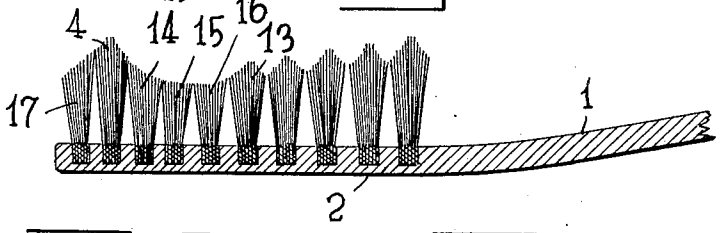


FIG. 6.

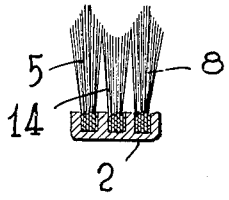
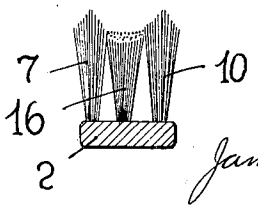


FIG. 7.



Inventor

James A. Malcolm.

By Frank H. Wisch.

Attorney

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Fig. 8.

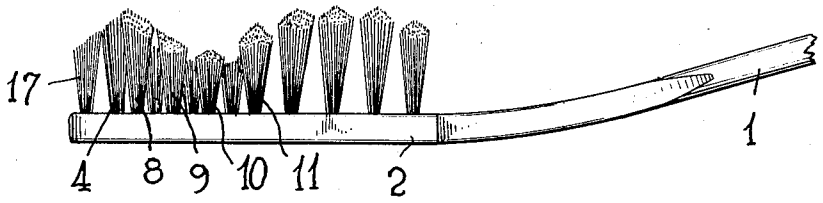
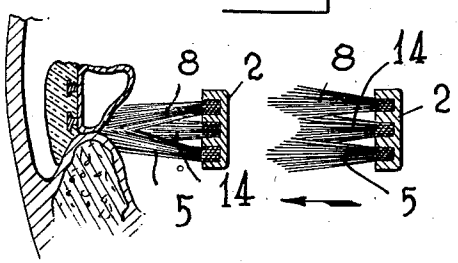


Fig. 9.



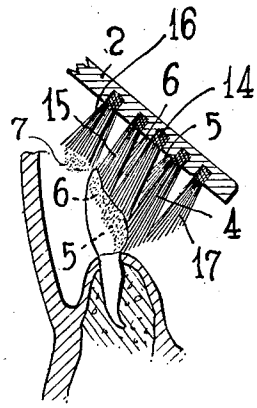


Fig. 10

Inventor

James A. Malcolm.

By Frank H. Wiech.

Attorney

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TOOTH BRUSH

James A. Malcolm, Sheraden, Pa.

Application May 4, 1935, Serial No. 19,892

3 Claims. (Cl. 15—167)

This invention relates to improvements in tooth brushes, or more particularly to improvements in the form and construction of tufts of bristles in a brush, which improvements render it highly efficient in the cleansing of teeth of all known structures.

It has long been a desire to construct a brush that will reach and cleanse any surface of any tooth that may be found in any mouth whether normal or abnormal in form, position or relation to adjacent teeth, and which brush will cleanse teeth with the least amount of effort. This is accomplished to a remarkably high degree with the product of the present invention.

In past forms of tooth brushes, one or more sets or tufts of bristles have been found to interfere with other tufts or with each other in getting into deep embrasures. The interfering tufts are displaced from an interfering position only with considerable difficulty, as by exerting great pressure. In their displaced positions, the bristles are generally found to be improperly placed for efficient cleaning. The brush to be described below, as a product of the present invention, is so constructed as to avoid any objectionable interference of tufts with other tufts in the brush during a mouth-cleansing operation.

In the accompanying drawings, which serve to illustrate the present invention, and in which like reference characters denote like parts,

Fig. 1 is a view of the under side of the brush stock or back;

Fig. 2 is a plan view of the brush;

Fig. 3 is a side elevation of the brush head;

Fig. 4 is a view of the free end of the brush head;

Fig. 5 is a longitudinal section of the brush head on line 5—5 in Fig. 2 in the direction of the arrows;

Figs. 6 and 7 are transverse sections of the brush head on line 6—6 and 7—7, respectively, in Fig. 2 in the direction of the arrows;

Fig. 8 is a side elevation of a modified brush head; and

Figs. 9 and 10 illustrate the manner in which certain portions of the brush perform their cleaning action on teeth.

Referring to the drawings, the tooth brush shown comprises a handle 1 and a brush head 2 provided with tufts forming a bristle face having contours of the type to be described. The tufts are set in sockets 3 in the usual manner. Although only one arrangement of sockets is shown in Fig. 1, it is to be understood that this arrangement may be varied, depending on the size of the brush head and the number of tufts in the brush head.

One important feature of the brush is a concavity or a cupped portion, which might also be described as a scoop-like or spoon-like portion, formed by tufts adjacent the free end of the brush head, substantially as illustrated in Figures 2 to 7, inclusive. A ridge is formed on the border of the cupped portion by long bristles in tufts 4, 5, 6, 7, 8, 9, and 10. The free ends of the bristles forming the ridge are illustrated by the darker dots in Fig. 2. The lighter dots indicate the approximate positions of the ends of the shorter bristles. The ridge may be in the form of an oval or an ellipse or in approximately such forms.

Another feature of importance is the portion of the ridge extending transversely of the brush head and formed by bristles near the free end of the brush head. This portion of the ridge is preferably in the form a curve; the curve being convex toward the free end of the brush head. The advantage of this will be explained below. The ridge may extend from the ends of said curve, straight or in curved form, along both sides of the brush and part of the way toward the handle end of the brush head. The top of the ridge perferably has a greater width than that formed by the thickness of a single line of bristles. That is, the top of the ridge may be several or more bristles across. Bristles on both sides of the ridge are of decreasing length in a direction away from the ridge.

A high portion in the ridge is formed by bristles in tufts 4, 5, and 8. Portions of the ridge formed by bristles in tufts 5, 6, and 7 on one side of the brush and by bristles in tufts 8, 9, and 10 on the other side of the brush, slope toward the base of the brush, reaching its low portions at about tufts 7 and 10, respectively.

Bristles, in tufts 4, 14, and 15 within the ridge, are of decreasing length toward the handle 1, the slope formed thereby reaching its low portion at tufts 15 and 16 beyond which the bristles increase in length to tuft 13 which is approximately at the end of the concavity formed within the ridge, as shown in Fig. 5.

A slope is formed in the bristle face by bristles of decreasing length in tufts 4 and 17 from the high portion of the ridge to the free end of the brush head. As shown in Fig. 4, the portion of the ridge nearest the free end of the brush head and formed by bristles in tuft 4 and some of the bristles in tufts 5 and 8, extends transversely of the brush head and is substantially parallel with

the base. The outer bristles in tufts 5 and 8, as well as in the other tufts extending along the sides of the brush, are of decreasing length towards the sides of the brush, thereby forming a bevel on each side of the bristle face throughout the length of the brush head.

The tufts in the brush head toward the handle and away from the region of the concavity may be of any desired number and may be of the character shown in Figs. 2, 3, and 5 or of the character shown in Fig. 8. In the former type of brush, the rear tufts are shown as of increasing length toward the handle. In the brush of the latter type (Fig. 8), the rear tufts may form more or less of a convexity. The transverse rows of tufts in the rear portion of either type of brush are tapered so as to form transverse ridges extending from bristles in the center of the tufts on one side of the brush to bristles in the center of the tufts on the other side.

It is seen from the above description that the cupped or concave portion in the bristle face of the brush and particularly the portion of the concavity nearest the tip of the brush enfolds the convex surfaces of a tooth or teeth, thereby acting as a guide so that the brush automatically places itself in the proper working position. For instance, when brushing the rear of the front teeth as shown in Fig. 10, which shows the working position of the brush when cleaning a lower front tooth, the wedge shaped form of the long tuft adjacent the tip of the brush permits the ends of bristles forming the transverse portion of the ridge to reach into the groove formed at the gum line around the entire rear side of the tooth. At the same time, due to the concavity in the brush, the ends of the bristles are in contact with the upper rear part of the tooth. A slight pressure brings the ends of the bristles forming the sides of the concavity and positioned towards the sides of the brush head into embrasures on either side of the tooth and in contact with the side surfaces of the tooth as shown by the dotted lines in Fig. 10. Furthermore, while cleaning the rear of one tooth, the teeth on either side are being cleaned on their adjacent surfaces by the ends of bristles in the bevelled portions of the brush head outside the ridge described above. It is important to note that the bristles reaching into the embrasures contact the surfaces of the sides of the tooth with their ends and not with their sides. Very little cleaning action results from rubbing of sides of bristles against a tooth. To obtain the best results, the ends of the bristles must rub across the surface to be cleaned.

In Fig. 9 there is illustrated the condition of the brush in its normal position, and its condition when cleaning on the inner side of bridge work. The ends of the outer tufts are brought together over the inner tuft by the sides of the groove formed by the bridge and the gum. The shorter inner tuft and the bevelled sides of the bristle face formed by outer tufts make it possible for the ends of the bristles in the side tufts to reach with ease the entire surface of the groove.

It has been found that a brush having the features described makes it possible to clean teeth thoroughly to the gum line. The brush readily reaches into grooves and sulci in an individual tooth and into embrasures (labial, buccal and lingual) formed by the relative position of one tooth with respect to another or the relative position of a tooth with respect to its investing structure.

What I claim is:—

1. A tooth brush having bristles forming in the bristle face a ridge that is substantially in the form of an ellipse having its major axis extending longitudinally of the brush head, and from substantially the outer wall of bristles at the free end of the brush head, and bristles placed inwardly and outwardly from the ridge and of decreasing length away from the ridge.

2. A tooth brush having bristles forming in the bristle face a ridge that is substantially in the form of an ellipse having its major axis extending longitudinally of the brush head, and from substantially the outer wall of bristles at the free end of the brush head, a portion of the plane of the ridge near the free end of the brush head sloping toward the base of the brush head in the direction of the handle.

3. A tooth brush having bristles forming in the bristle face a ridge that is substantially in the form of an ellipse having its major axis extending longitudinally of the brush head and from substantially the outer wall of bristles at the free end of the brush head, a portion of the plane of the ridge near the free end of the brush head sloping toward the base of the brush head in the direction of the handle, and bristles placed inwardly and outwardly from the ridge and decreasing in length in directions away from the ridge.

4. In a tooth brush having a plurality of tufts forming a bristle face, a substantially curved U-shaped ridge formed by the ends of bristles in the said bristle face, the said ridge extending cross-wise of the bristle face adjacent the free end of the brush head and the said ridge having its convex portion toward the said free end of the brush head.

5. In a tooth brush having a plurality of tufts forming a bristle face, a substantially curved U-shaped ridge formed by the ends of bristles in the said bristle face, the said ridge extending cross-wise of the bristle face adjacent the free end of the brush head and the said ridge having its convex portion toward the said free end of the brush head, and other bristles on both sides of the said ridge.

6. A tooth brush having bristles forming a ridge in the bristle face, the said ridge extending transversely of the bristle face and along opposite sides thereof, portions of the said ridge on opposite sides of the bristle face lying in a plane that slopes toward the base of the brush head in the direction of the handle, the said ridge extending from the free end of the brush head, and the said portions of the ridge in the said plane being adjacent the said free end.

7. A tooth brush having bristles forming a ridge in the bristle face, the said ridge extending transversely of the bristle face and along opposite sides thereof, portions of the said ridge on opposite sides of the bristle face lying in a plane that slopes toward the base of the brush head in the direction of the handle, the said ridge extending from the free end of the brush head, and the said portions of the ridge in the said plane being adjacent the said free end; and bristles placed inwardly and outwardly from the ridge and forming sloping portions of the bristle face that incline toward the base of the brush.

8. In a tooth brush comprising a brush head including a base and bristles extending in substantially the same direction from the base and forming a bristle face, the free ends of bristles adjacent the free end of the brush head forming a depression in the bristle face, the said depression

extending from an intermediate transverse row of bristles to substantially the said free end of the said brush head and extending substantially across the width of the said bristle face, and portions of the said bristle face forming the said depression declining toward the base inwardly from substantially the opposite sides of the said bristle face and from substantially the said free end of the brush head, whereby a ridge is formed in the bristle face along the said sides of the bristle face and transversely adjacent the said free end of the brush head.

JAMES A. MALCOLM.