Aug. 28, 1928.

1,682,548

T. W. BIGONEY

TOOTHBRUSH

Filed Jan. 25, 1928

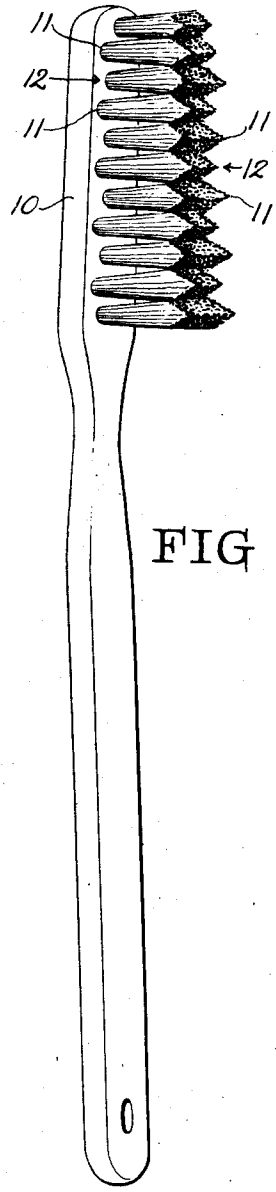


FIG 1

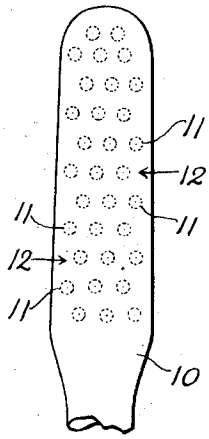


FIG 2

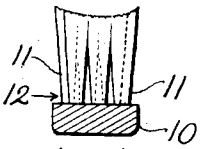


FIG 3

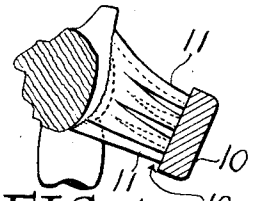


FIG 4

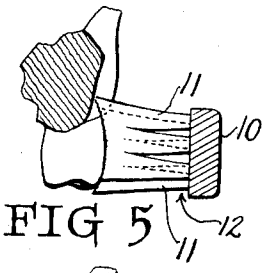


FIG 5

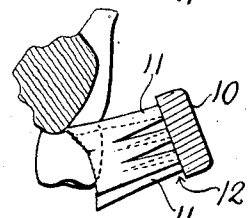


FIG 6

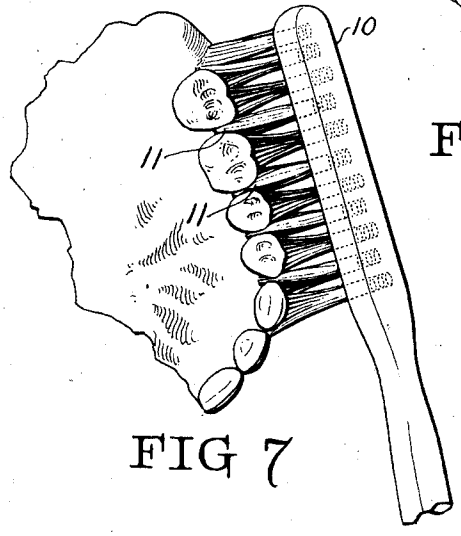


FIG 7

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UNITED STATES PATENT OFFICE.

THOMAS W. BIGONEY, OF PHILADELPHIA, PENNSYLVANIA.

TOOTHBRUSH.

Application filed January 25, 1928. Serial No. 249,228.

The object of this invention is to produce a toothbrush which is mechanically more efficient as a cleaning agent in the hands of the ordinary user than any toothbrush now on the market.

Although many toothbrushes have been made or proposed of various shapes with respect to the contour and curvature of the handles and brush-heads and the number, length, spacing and trimming of the bristle-tufts, none is ideal. Some are primarily suited for cleaning the inside surfaces of the teeth; others are better suited for cleaning the outside surfaces, but all, in the hands of the ordinary user, are relatively ineffective for cleaning the interdental spaces and approximal surfaces of the teeth.

Those who have made a special study of oral prophylaxis have long recognized the fact that the failure on the part of the ordinary toothbrush user to remove food particles from the approximal surfaces of the teeth is responsible to a great extent for the incidence of dental caries. The mechanical reason for the condition stated is that unless more skill than the average toothbrush user possesses is exercised in brushing the teeth, the relatively stiff mass of bristles composing the brush-head contacts with the convex portions of the teeth and tends to hold those bristles which are oriented to the interstices between the teeth out of these interstices or at least to prevent any bristles from making the deep penetration which is necessary to clean the interstices of objectionable matter. If the mass of bristle ends is convexly rounded transversely which is the usual manner of trimming the bristle ends, the effect just described is more pronounced.

The basic principle of my construction and hence its peculiar mechanical action is not found in any of these toothbrushes. I have invented a toothbrush of new design in which I have overcome the mechanical shortcomings of toothbrushes as heretofore manufactured and generally employed by users of average knowledge and skill. My improved brush insures penetration of the interdental spaces regardless of which particular direction is given to the brushing action. How this very desirable result is accomplished may best be understood by consideration of the construction shown in the accompanying drawings in which:

Fig. 1 is a perspective view of my improved toothbrush;

Fig. 2 is a back, plan view of the brush-head showing in dotted lines the offset method of inserting the bristles in the head of the brush handle;

Fig. 3 is a transverse section through the brush-head, the bristles being somewhat diagrammatically shown to indicate the offset arrangement of bristles;

Figs. 4, 5 and 6 are semi-diagrammatic sections showing the various characteristic positions automatically assumed in relation to the tooth and gum surfaces by the bristles of my improved toothbrush when in use; and

Fig. 7 is a partial perspective view showing my improved brush in the act of cleaning the outer portions and interdental spaces of the upper teeth on the right side of the jaw.

In my improved construction instead of setting the bristle-tufts in the back of the brush-head in several parallel rows longitudinally as in the ordinary toothbrush, I have arranged them in transverse rows and staggered or offset alternate transverse rows.

By means of this arrangement there are provided spaced tufts of bristles along each side of the main body of the bristles which stand out from the other bristles and are capable of greater freedom of movement during the use of the brush. These outstanding tufts come in alternate rows and the distance between alternate rows approximates the width of the average tooth. By reason of this spacing of the tufts, which are so positioned that they are capable of action independent of that of the main body of the brush, they tend to automatically come to positions between adjacent teeth and more easily enter therebetween.

In addition to this staggering of the rows the ends of the mass of bristles are preferably cut slightly concave transversely, and therefore the bristles which are farthest from the center line of the brush, namely, those of the outstanding tufts, are the longest. This concave cutting, in combination with the staggering, results in the bristles which have the greatest freedom of movement being the longest, and these tend to automatically enter the spaces between the teeth and to penetrate further than do the bristles of the ordinary brush.

My improved brush may be maufactured without any radical departure from established toothbrush manufacture. In the construction illustrated the head 10 of the brush may be constructed of any of the usual mate-

rials and the bristles secured in any suitable manner in tufts of the usual size.

In the embodiment of my invention which I have illustrated the tufts are arranged in a plurality of transverse parallel rows, there being the same number of tufts, preferably three, in each row, with the possible exception of the terminal row. The end tuft 11 of each alternate row stands out slightly from the main mass of the bristles. By staggering the rows as shown in Fig. 2 the outstanding bristle tufts of alternate rows come a ong one side and the outstanding tufts of the other rows come at the opposite side of the brush. Slight cavities or recesses 12 are formed along each side between the outstanding tufts 11, and thus these tufts are relatively unsupported by the bristles forming the remainder of the brush, and have greater freedom of movement. The concave trimming of the bristles of the entire brush transversely as shown in Fig. 3, results in these outstanding tufts being longer than the other bristles of the brush. The forming of the brush with these relatively freely moving longer bristles spaced to distances approximating the width of an average tooth, permits of the maximum efficiency in the cleaning of the approximal surfaces, as well as the more exposed surfaces of the teeth.

The pronounced serration of the bristle ends produced on both sides of the brush by the outstanding tufts of bristles tends, as the bristle ends contact with the gum margin in use to automatically orient the longest and independently acting bristle-tufts to the concavities of the gum margin and to the interstices between the teeth. This action is characteristic of my improved toothbrush whether the bristle-ends are first placed on the gums as shown in Fig. 4 and then rotated through the successive positions illustrated in Figs. 5 and 6 or whether the bristle-ends are placed in contact with the teeth in any of the positions, shown in Figs. 4, 5, and 6, and the brush simply drawn back and forth horizontally.

If the brush is more properly used with the rotating action already referred to the outstanding tufts of bristles will automatically penetrate deeply into the interdental spaces as illustrated in Fig. 7 which shows the position assumed by the bristles just after the rotating action has commenced.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A toothbrush having a bristle support and a plurality of parallel transversely extending rows of tufts of bristles, there being the same number of tufts in each row, and the alternate rows being offset transversely of the bristle support, whereby each alternate row at one end, and each of the other rows at the opposite end, has an outstanding tuft relatively unsupported by the other tufts, and having relatively greater freedom of movement.

2. A toothbrush having a bristle support and a plurality of parallel transversely extending rows of bristles, there being a plurality of tufts in each row, and each alternate row having an outstanding tuft disposed laterally of the bristle support beyond the tufts of the adjacent rows, whereby said outstanding tufts are relatively unsupported by the other tufts and have relatively greater freedom of movement, the mass of bristle ends being concavely cut transversely of the brush, whereby the bristles of said first mentioned outstanding tufts are of greater length than those of the adjacent tufts.

3. A toothbrush having a bristle support and a plurality of parallel transversely extending rows of bristles, there being a plurality of tufts in each row, and each alternate row having an outstanding tuft disposed laterally of the bristle support beyond the tufts of the adjacent rows, whereby said outstanding tufts are relatively unsupported by the other tufts and have relatively greater freedom of movement, the spacing of the transverse rows lengthwise of the brush being such that the outstanding tufts are spaced to distances approximating the width of an average tooth.

4. A toothbrush having a bristle support and a plurality of parallel transversely extending rows of bristles, there being a plurality of tufts in each row, and each alternate row having an outstanding tuft disposed laterally of the bristle support beyond the tufts of the adjacent rows, whereby said outstanding tufts are relatively unsupported by the other tufts and have relatively greater freedom of movement, the mass of bristle ends being concavely cut transversely of the brush, whereby the bristles of said first mentioned outstanding tufts are of greater length than those of the adjacent tufts, and the spacing of the transverse rows lengthwise of the brush being such that the oustanding tufts are spaced to distances approximating the width of an average tooth.

Signed at New York, in the county of New York and State of New York, this twenty-fourth day of January, A. D. 1928.

THOMAS W. BIGONEY.