April 20, 1937. C. V. BOYD 2,077,392

TOOTH BRUSH

Filed June 27, 1935

Fig. 1

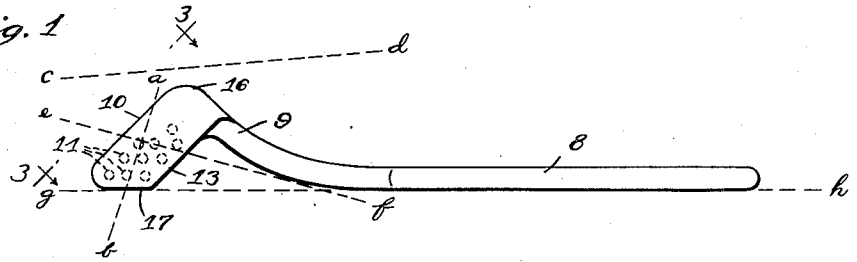


Fig. 2

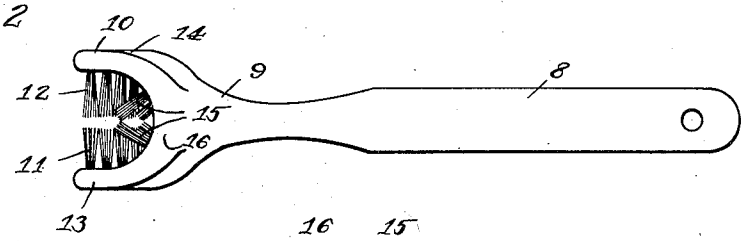


Fig. 3

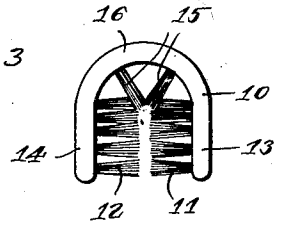


Fig. 4

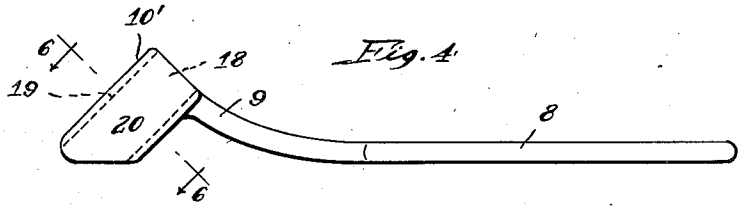


Fig. 5

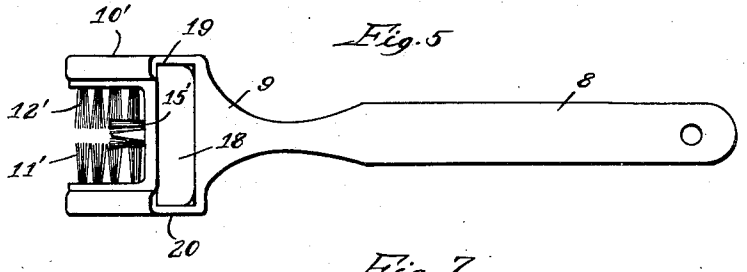


Fig. 6

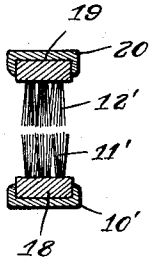
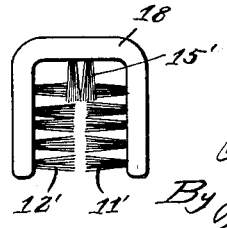


Fig. 7



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TOOTH BRUSH

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5 Claims. (Cl. 15—167)

This invention relates to toothbrushes and is particularly concerned with a novel form of U-shaped brush for conveniently, comfortably and efficiently cleansing all surfaces of the teeth simultaneously, and the embrasures and gingival margins at the same time.

I am aware that U-shaped toothbrushes have been devised before but despite the fact that various designs have been proposed, none has attained any commercial success. I attribute the failure of these earlier efforts to a number of objectionable features which have been eliminated in the brush of my invention to obtain practicability and commercial feasibility.

The principal object of my invention is to provide a brush of the kind mentioned in which the U-shaped head is disposed at an obtuse angle with relation to the handle and the end of the handle is bent upwardly and joined to the middle of the head, preferably so that the handle proper lies in the same plane with the lower end of the head. This special relationship of the head to the handle enables one to reach all of the teeth without discomfort or awkwardness and permits efficient brushing of all surfaces, thus promoting greater cleanliness and sanitation than has been obtainable with any other brushes of this type or with the conventional type.

A further feature of the invention lies in the shaping of the lower end of the head flat and preferably in a common plane with the bottom of the handle and placing rows of bristles substantially parallel to this flat bottom, so that there will be many bristles down low where they will thoroughly cleanse the necks of the teeth and also the gingival margins and embrasures. The rows are placed in laterally offset relation to give a brushing face of much greater width than the width of the side of the head.

Still another object consists in reducing the vertical dimension of the rearwardly inclined head still further by cutting away a portion of the top thereof at the front of the head, that is, at the diagonally opposite corner from the flattened bottom, whereby to make it possible to reach the rear molars without difficulty or discomfort.

The invention is illustrated in the accompanying drawing, in which—

Figures 1 and 2 are a side and top view, respectively, of a brush made in accordance with my invention;

Fig. 3 is an end view taken in the plane of the line 3—3 of Figure 1;

Figs. 4 and 5 are a side and top view, respectively, of a toothbrush of a modified construction;

Fig. 6 is a cross-section on the line 6—6 of Fig. 4, and

Fig. 7 is a front view of the bristle insert.

Similar reference numerals are applied to corresponding parts throughout the views.

Referring to Figures 1–3, 8 designates the elongated handle of the brush whose front end portion 9 is bent upwardly preferably in a curve at an obtuse angle to the rest of the handle and joined to the middle of the inverted U-shaped head 10. The latter is disposed in a plane in transverse relation to the handle and making substantially a right angle with the end portion 9, so that the head is at an obtuse angle with respect to the rest of the handle. Bristles 11 and 12 project from the inside surfaces of the head inwardly toward each other from the opposite side portions 13 and 14, and other bristles 15 project downwardly from the middle portion 16. The bristles 11 and 12 will serve to clean the inside and outside surfaces of the teeth known as the lingual and buccal surfaces, and the bristles 15 will clean the occlusal or chewing surfaces. The bristles 11 and 12 will, furthermore, brush and massage the gums at the same time that the necks of the teeth are being cleaned, thus cleaning the gingival margins and embrasures and removing tartar from the necks of the teeth. The massaging of the gums coupled with the cleaning of the free margins naturally promotes a healthier and more wholesome condition.

The fact that the head 10 is inclined at an obtuse angle with relation to the handle 8 is of advantage because it permits operation of the head transversely of the teeth while inclined at an acute angle to the vertical axis *a—b* of each tooth, thus enabling the brush to be entered to the innermost recesses of the mouth without discomfort or awkwardness. The user need not open his mouth any wider than he is accustomed to doing in using the conventional toothbrushes, the extent of opening required being indicated by the dotted lines *c—d* and *e—f*, which represent the angle between the upper and lower teeth. This view further serves to show how the "reach" of the brush is greatly increased by virtue of the angular relationship of the head to the handle; the extremities of the side portions 13 and 14 reach far out ahead of the middle portion 16. Then too, it will be noticed how much the vertical dimension of the rearwardly inclined head is reduced by cutting away or rounding the top at the front of the head, that is, at the diagonally opposite corner from the flattened bottom. This

makes it possible to reach and brush the rearmost molars easily and comfortably, that is, with minimum separation of the jaws. The ends of the side portions 13 and 14 are formed flat, as indicated at 17, preferably in a common plane with the bottom surface of the handle 8, as indicated by the dotted line *g—h*. This formation is important from the standpoint that it permits the placing of more tufts of bristles at the ends of the side portions where there is the greatest need for brushing, namely, across the necks of the teeth and along the free margins of the gums as well as across the embrasures. It will be noticed that three tufts of bristles 11 and 12 are located in longitudinal spaced relation on lines parallel with the flat ends 17. The other rows of bristles 11 and 12 are located on lines parallel with these bottom rows of bristles, as indicated in dotted lines in Figure 1. The arrangement illustrated gives a brushing face of much greater width than the width of the side of the head approximately in the ratio of 5 to 3, as clearly appears from inspection of Fig. 1, there being five rows of bristles available with my diamond or parallelogram arrangement as against three rows that would be effective if the longitudinal axis of the head 10 coincided with the axis *a—b*, indicated in Fig. 1. The beveling off of the side portions of the head, as at 17, is of further advantage from the standpoint of making it easier to get the brush into and out of position in the mouth, the side portions projecting downwardly on opposite sides of the teeth only so far as absolutely necessary but no farther. The user appreciates this feature most when he sees to what a small extent it is necessary for him to open his mouth to have the brush operate upon the rearmost molars.

In Figs. 4–7, I have shown a modified construction in which a head 10' is molded integral with the handle and receives a U-shaped insert 18 carrying the bristles 11', 12' and 15'. The insert will be of a plastic material similar to what is used in the construction of the brush of Figs. 1–3, which is bendable to the desired form after the bristles have been inserted. It is obvious that by molding the brush body in one piece, providing longitudinal grooves 19 in the side portions 20 to receive the insert 18 with a press fit, the manufacture of these brushes is simplified and the cost lowered, because with such a construction the inserts 18 can be made from strips in which the bristles are mounted previous to the bending thereof to U-shape, thus reducing the forming operations to a minimum. This single forming operation is, furthermore, much simpler than is involved where the entire brush must be handled, as will, no doubt, be obvious to any one skilled in this art.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn with a veiw to covering all legitimate modifications and adaptations.

I claim:

1. A toothbrush comprising an elongated straight handle having an upwardly bent end portion at an obtuse angle thereto, and an inverted U-shaped head from the middle of which the bent end of the handle extends, the head being disposed in a plane in transverse relation to the handle and making substantially a right angle with the bent end portion, whereby said head is at an obtuse angle with respect to the straight part of the handle, and bristles on said head projecting from the inside surfaces thereof inwardly toward each other from the opposite side portions approximately in the same plane with the straight portion of the handle.

2. A toothbrush as set forth in claim 1 wherein the side portions of the U-shaped head have the ends thereof cut off at an acute angle to the plane of said head to form bottom faces substantially in the plane of the bottom of the handle.

3. A toothbrush comprising a U-shaped brush head having the sides thereof of substantially uniform width and thickness, with the ends of the arms of the U tapered to form surfaces in a plane at an acute angle to the plane of the head, a rearwardly extending elongated handle in approximately the same plane with the aforesaid surfaces and having a curved end portion joined to the middle of the head at the back.

4. A toothbrush comprising a U-shaped brush head, a rearwardly extending elongated substantially straight handle having a curved end portion joined to the middle of the head at the back thereof, the head being disposed in a plane in transverse relation to the handle and making substantially a right angle with the curved end portion whereby said head is at an obtuse angle with respect to the straight part of the handle, and tufts of bristles on said head projecting from the inside surfaces of the arms of the U, said tufts being arranged in substantially parallel rows with the outermost rows approximately in the same plane with the straight part of the handle and the other rows in laterally offset relation to the outermost rows.

5. A toothbrush comprising a U-shaped brush head having the sides thereof of substantially uniform width and thickness, with the ends of the arms of the U tapered to form surfaces in a plane at an acute angle to the plane of the head, a rearwardly extending elongated handle in approximately the same plane with the aforesaid surfaces and having a curved end portion joined to the middle of the head at the back, the cross portion of the head being also cut away on that side opposite the juncture of the head and handle in a plane substantially parallel with the plane of the first mentioned surface.

CHESTER V. BOYD.