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 a part interest

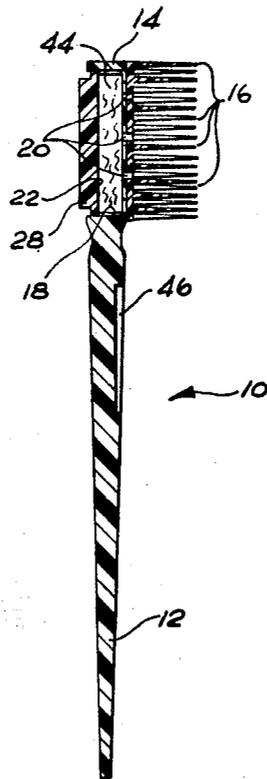
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- [54] **DISPOSABLE TOOTHBRUSH**  
 7 Claims, 7 Drawing Figs.
- [52] U.S. Cl. .... **401/176,**  
 15/104.94, 15/167, 401/287
- [51] Int. Cl. .... **B43k 5/06**
- [50] Field of Search ..... 15/16 R, 16  
 A, 186—188; 401/184, 171—186, 286—287

**ABSTRACT:** A disposable toothbrush with self-contained dentifrice in which bristles, base therefore and handle are molded in integral one-piece construction of flexible resilient material. A recess is defined in the rear of the base for storing the dentifrice and communicates with the bristles via openings through the base, whereby the dentifrice may be forced through the openings onto the bristles.



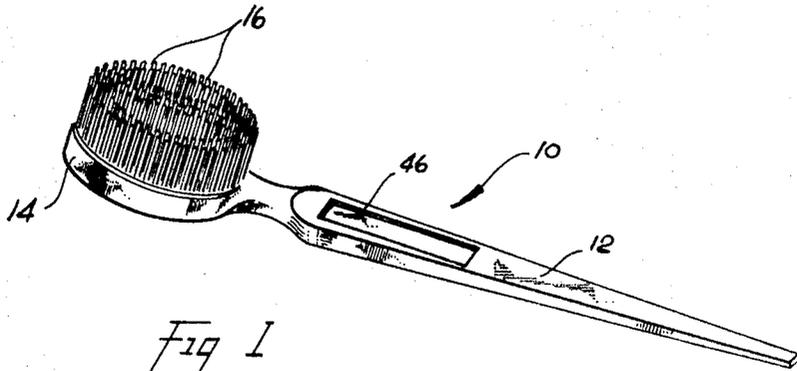


Fig 1

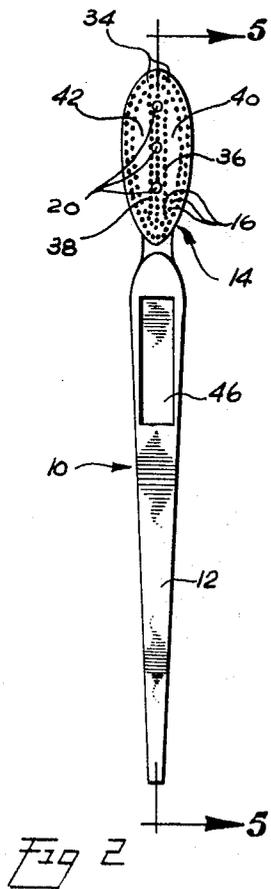


Fig 2

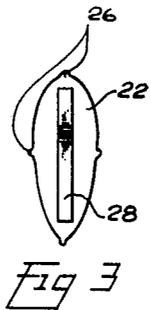


Fig 3

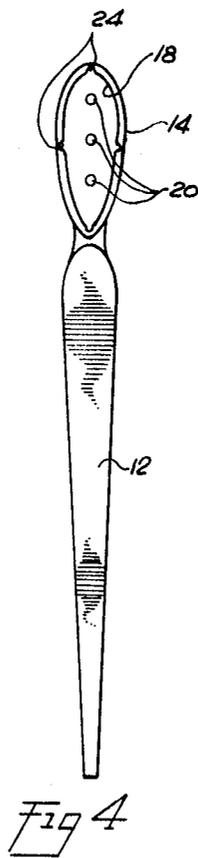


Fig 4

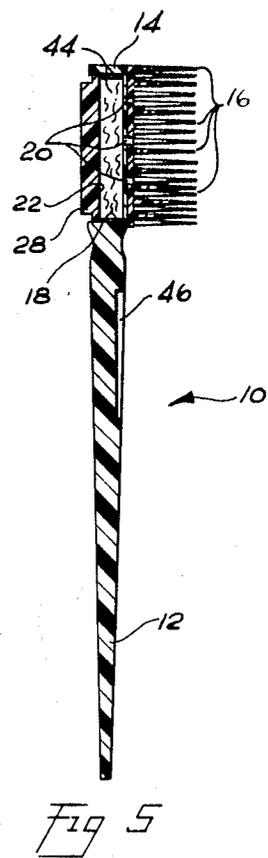


Fig 5

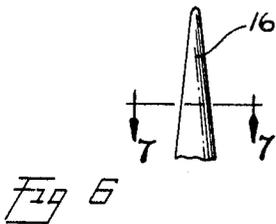


Fig 6

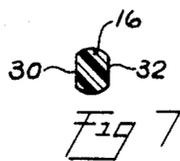


Fig 7

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## DISPOSABLE TOOTHBRUSH

## FIELD OF THE INVENTION

The field of art to which this invention remains is the field of toothbrushes.

## BACKGROUND AND SUMMARY OF THE INVENTION

It is often desirable to have a small toothbrush and a convenient supply of dentifrice that one could discard after using just once. For example, one could use such a toothbrush after dining in a restaurant or in an airplane or train; but such toothbrushes are not generally available at these locations in sanitary form. A variety of disposable toothbrushes have been proposed which have attempted to combine economy of manufacture and preincorporation of dentifrice with the toothbrush. However, those toothbrushes which contain dentifrice in a location allowing ready utilization have generally been too expensive for widespread distribution as a disposable toothbrush for one-time use. Those prior structures which are obtained with economy of manufacture generally fail to provide the dentifrice in a form wherein the dentifrice can be readily spread throughout the bristles.

The present invention provides a disposable toothbrush with self-contained dentifrice which is of extremely simple construction yet is rugged and capable of vigorous brushing. The toothbrush provided herein is so inexpensive that it may be economically used once and then disposed of, and yet contains a suitable quantity of toothpaste or other dentifrice which is fed directly onto the bristles at the time of using and readily spreads through the bristles so that proper foaming and brushing can be accomplished. Specifically, the toothbrush provided herein includes bristles, a base therefore and a handle all molded in integral one-piece construction of flexible resilient material. A recess is defined in the rear of the base with one or more openings through the base in communication with the bristles. Dentifrice is contained within the recess and may be forced through the openings onto the bristles. A rigid cover is provided for the recess, conforming to the perimeter thereof, and movable inwardly toward the openings so as to force the dentifrice through the openings onto the bristles. The recess is elongate in conformity with the bristle base and the cover has an axial rib on the external surface thereof to aid in applying pressure to the dentifrice.

As openings, there is formed a plurality of ducts substantially in a line axially central of the base and the bristles are arranged so that two rows thereof are formed relatively close along opposite sides of the line of ducts. Additionally, a row of the bristles is formed adjacent each side of these closely formed rows but spaced therefrom to define open regions among the bristles. Each bristle is formed flat on two opposite sides to aid in its flexure to thereby enable a more rapid and thorough spreading of the dentifrice and more effective cleaning of the teeth. In a particular embodiment, the handle is formed with a depressed region lengthwise thereof in which written matter may be placed, for identification, advertising, or otherwise.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a toothbrush according to the present invention;

FIG. 2 is a front view of the toothbrush;

FIG. 3 is a rear view of the toothbrush with the recess cover removed;

FIG. 4 is a plan view of the recess cover;

FIG. 5 is a cross-sectional view of the toothbrush, taken on line 5-5 of FIG. 2, in the direction of the arrows;

FIG. 6 is a detail view of a bristle formed with the toothbrush of the present invention; and

FIG. 7 is a cross-sectional view of the bristle, taken on line 7-7 of FIG. 6, in the direction of the arrows.

## DETAILED DESCRIPTION

Referring to FIG. 1, a perspective view of the disposable toothbrush 10 is shown. The toothbrush 10 includes a handle portion 12, a base or head portion 14 and bristles 16 extending from one side of the base 14. The toothbrush 10 is of integral one-piece construction and formed of a flexible resilient material, such as by injection molding, or by other processing, or an organic polymer or polymer-forming material. Generally, such material as polyethylene, polyvinyl chloride, polyamide, cellulose acetate, polystyrene, polypropylene, or the like, can be utilized and the thinness of the bristles 16 will impart added flexibility to these materials. However, it is also desirable that the handle portion 12 be somewhat flexible and it is found that polyethylene imparts all of the desired properties. In order to effect the economies necessary to enable mass distribution the construction must be as simple as possible. The structure as described hereinafter is designed to accomplish this simplicity while imparting functional advantages not obtained with prior structures.

Referring to FIGS. 2-5, a recess 18 is formed through the back of the base 14 and generally follows the shape of the base 14. Three ducts 20, about 0.05 inch diameter, are formed through the base 14 effecting communication between the recess 18 and the bristles 16. As seen clearly in FIG. 3, the ducts 20 are formed substantially in a line axially central of the base 14. This feature in conjunction with the placement of the bristles as hereinafter described enables rapid and effective disbursement of the dentifrice.

Referring specifically to FIG. 4, a cover 22 is formed for the recess 18, the outline of the cover 22 conforming substantially to the perimeter of the recess 18 so as to be close fitting therewith. In this particular embodiment, a number of notches, such as at 24, are formed along the rim of the base 14 material defining the recess, and a corresponding number of similarly located tabs, such as at 26, are formed along the edge of the cover 22 for engagement with the notches 24. The cover 22 is provided with a rib 28 externally and axially central thereof and which serves as a stiffening member for the cover 22 so as to provide the cover 22 with greater rigidity. The recess cover 22 can be made of the same material as the toothbrush 10, or it can be made of different material. The cover 22 is advantageously formed of a material which is more rigid than polyethylene, such as polystyrene.

The bristles 16 are formed so as to extend a sufficient distance from the front of the base 14 to obtain a degree of flexibility appropriate to the brushing of teeth. In this particular embodiment, the bristles are obtained by drilling holes into the mold plate eleven thirty-seconds inch deep and 0.045 inch wide. Referring to FIGS. 6 and 7, the drill holes are coined flat so as to obtain bristles which are each formed flat on two opposite sides 30 and 32.

Referring back to FIGS. 2 and 5, the bristles 16 are arranged in a particular order which aids in rapidly spreading and foaming the dentifrice. This arrangement is illustrated in FIG. 2 where it is seen that at least two rows of bristles are formed relatively close axially central of the base 14 along opposite sides of the line of ducts 20. In this particular case, there are three such rows of bristles designated collectively by the numeral 34, the center row thereof being formed directly over the line of ducts 20. Additionally, a row of bristles 36 and 38 is formed adjacent each side of the central group of bristles 34 but is spaced therefrom to define open regions 40 and 42. Additional bristles may be formed outside of and adjacent these bristles rows 36 and 38. The closely spaced axially central rows of bristles 34 and open spaces 40 and 42 function as hereinafter described.

Referring again to FIG. 5, after the toothbrush 10 is formed, the recess 18 is filled with a dentifrice 44. Any dentifrice 44 can be utilized, such as toothpaste, toothpowder, or a water-soluble capsule. In the latter cases, the toothbrush 10 would have to be immersed in water to allow the water to enter the

ducts 20 and dissolve the capsule or powder, whereupon the toothbrush can be utilized as hereinafter described. Advantageously the dentifrice 44 is toothpaste. The cover 22 is then put in place and is sufficiently close fit to the recess 18 that it frictionally adheres to the base 14.

The assembled toothbrush 10 containing the dentifrice 44 can be packaged in any convenient manner and distributed in the form illustrated. In use, one need merely remove the toothbrush from the package, press the cover 22 inwardly toward the ducts 20 to force the dentifrice 44 onto the bristles 16, and then brush. When the dentifrice 44 is forced through the ducts 20, it is disposed between the closely arranged bristles in the axially central rows 34. Brushing flexes these bristles which serve to whip up the dentifrice and to squeeze the dentifrice into the open regions 40 and 42, where it foams up. The novel construction herein thus effects a rapid distribution and foaming of the dentifrice.

Referring now to a further feature of this invention, and particularly with reference to FIGS. 1, 2 and 5, the handle 12 is formed with a depressed, generally flat region 46 on one side thereof, advantageously on the bristle side. By such means, one can insert identifying material, in the form of an elongate sticker, in the region 46, which may be advertising material, or merely a label identifying the manufacture of the toothbrush.

What I claim is:

- 1. A disposable toothbrush with self-contained dentifrice, comprising;
  - a brush portion comprising a base and bristles extending from the front of said base;
  - a handle;
  - said bristles, base and handle being formed in integral one-piece construction of flexible resilient material;

a recess defined into said base through the rear surface thereof, said recess being defined elongate and substantially the length of said base;

one or more openings defined through said base, at said recess, to the front thereof;

dentifrice within said recess and a cover close fit in said recess moveable inwardly toward said one or more openings for forcing said dentifrice therethrough onto said bristles; one or more rows of said bristles being formed substantially axially central of said base and an arcuate row of said bristles being formed adjacent each side of said one or more axially central rows but spaced therefrom to define open regions thereat among said bristles.

2. The invention according to claim 1 in which said cover is a rigid member substantially conforming to the perimeter of said recess.

3. The invention according to claim 1 in which said cover for said recess conforms to the perimeter thereof and has an axial rib on its external surface.

4. The invention according to claim 1 in which said one or more openings comprise a plurality of ducts substantially in a line axially central of said base.

5. The invention according to claim 4 in which said bristles include two rows thereof formed relatively close along opposite sides of said line of ducts.

6. The invention according to claim 1 in which said bristles are each formed flat on two opposite sides.

7. The invention according to claim 1 in which said handle is formed with a depressed region lengthwise thereof for placement thereat of written matter.

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