

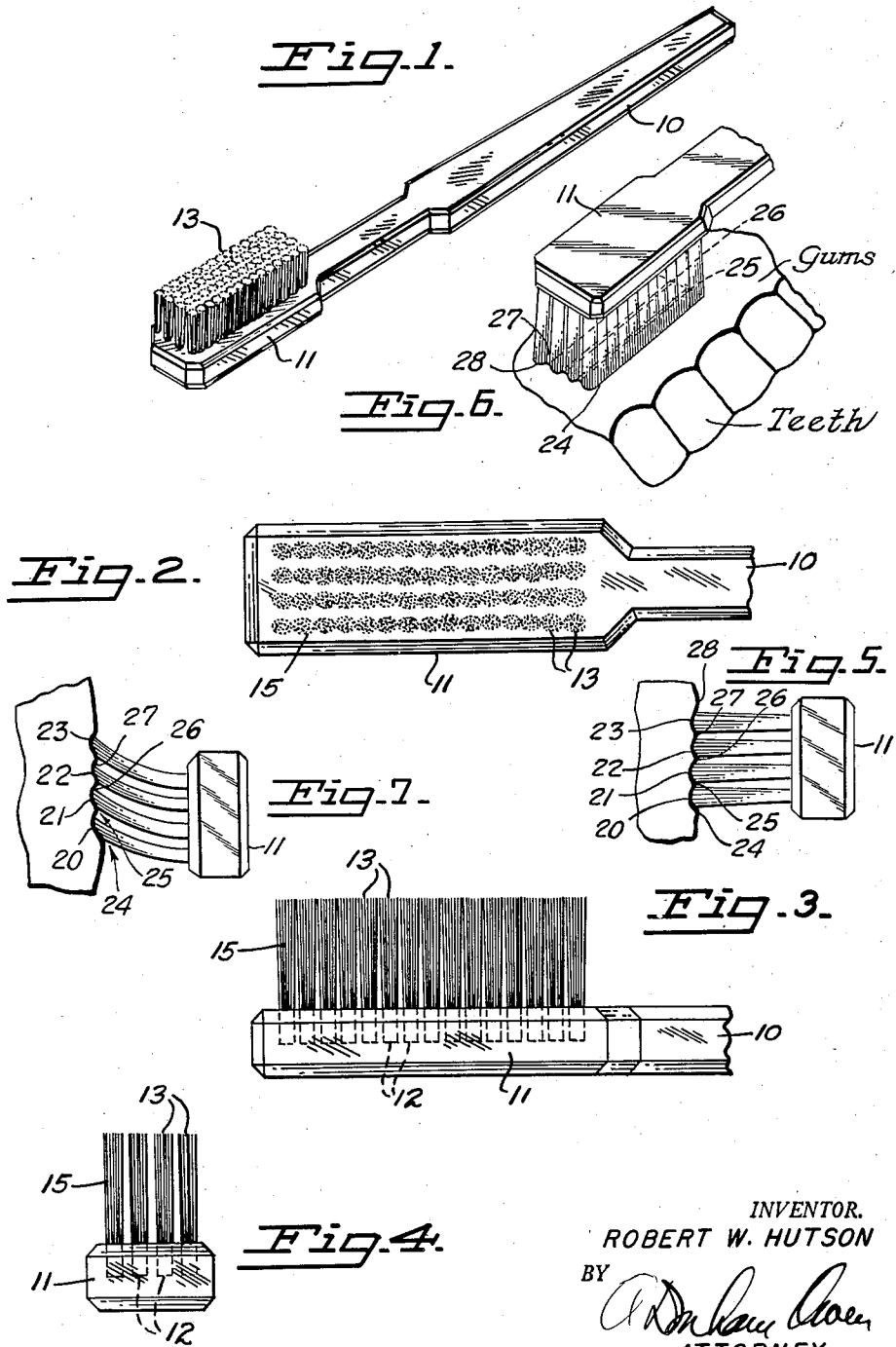
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BRUSH

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BRUSH

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3 Claims. (Cl. 15-167)

This invention relates to an improved brush for cleaning the teeth and massaging the gums. This application is a continuation-in-part of application Serial Number 138,493, filed January 13, 1950, now abandoned.

This brush is the solution to a long-standing problem to provide a brush suitable for brushing both the teeth and the gums. Many people erroneously assume that a toothbrush is intended solely for cleaning and polishing the teeth. Care of the gums has come to be considered equally important, for prevalent theories are that if the gums are not properly cared for, even healthy teeth may be lost. Some dentists have long advocated that the term "toothbrush" should be changed to the term "mouthbrush," as the latter would be more descriptive of the true function of the brush.

Brushes heretofore in use for brushing the teeth have proved to be unsuitable for use on the gums. They have scratched the gingival tissue and have caused it to bleed. The problem for a long time has been to provide one brush with characteristics enabling it to do both jobs—clean the teeth and massage the gums. This problem the brush of this invention solves.

Another problem solved by this invention has been to provide a brush which will clean the teeth thoroughly without abrading them. Toothbrushes heretofore in use have been unsatisfactory because they have scratched the enamel on the teeth.

Another problem has been to provide a toothbrush with bristles that will pick up tooth powder easily and retain it on the working surface of the brush. Tooth powder is generally held in the hand and picked up by a moist brush. With the brushes heretofore in use, the powder has been picked up unevenly and has tended to fall down through the bristles into the inside of the brush near their base. This wastes the cleaning powder, and makes a messy job of cleaning the teeth. With some brushes, it has been impossible to get enough powder onto the surface of the teeth to effect a good scrubbing action.

Another problem has been to provide a brush which will not wear out unevenly and thereby lose its efficiency.

All these problems are solved by the present invention, whose all-round performance is such that it can really be called a "mouthbrush."

I have discovered that one reason why prior art brushes scratched and damaged both the gums and the teeth was because their bristles were too coarse and too firm. Because of their coarseness, the bristles were not able to yield enough or give way as the brush passed over the surface of the gums and teeth. This effect has been particularly noticeable with the coarse nylon bristle brushes heretofore in use, which have tended not only to scratch the gums but to abrade the teeth. Coarse bristle brushes cannot be used in gum massage, so in the past this has meant that the user has kept the brush off the gums.

Another reason why the bristles on prior art brushes have scratched the teeth and gums has been that the

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individual tufts of bristles have been mounded or tapered on the working end by trimming the tuft from the outside in toward the center. The result of this trimming has been to give each bristle a sharp point as when a twig is cut at an angle with a sharp knife. These sharp pointed bristles are especially likely to injure the gingival tissue.

Due to the taper on the tuft, the likelihood of injury is accentuated because the bristles at the center of the tuft are longer than the outside bristles. This means that the pressure from the hand is transmitted to the teeth or gums by only the longest of the bristles.

The toothbrush of this invention employs a special type of bristle. It is a small diameter nylon bristle that is more soft or flexible and resilient than the nylon or natural bristles heretofore in use. The invention also is characterized by the fact that a large number of these slender bristles are used to make up each tuft, by the fact that the tufts are very close together, and by the fact that the bristles are trimmed straight across to substantially the same height. The result is that the bristles contact the teeth and the gums with a soft sweeping action. The closeness and the large number of the thin bristles, in combination, gives the support needed to brush off any foreign matter which may be on the teeth. When the bristles give way under pressure, the fact that they are closely compacted and that there are so many helps them support each other. The brush is used without harm to massage the gums.

Because the bristles are so close together, are so fine, and are cut off evenly, they also pick up tooth powder readily and tend to support it on their ends until it is carried into contact with the wet surfaces of the teeth.

Other objects, advantages and characteristics of the invention will be seen from the following description of a detailed embodiment thereof. In accordance with U. S. Revised Statutes, Section 4888, an illustrative embodiment is described in detail, but the invention is not intended to be limited by such details, except as required by the appended claims.

In the drawings:

Fig. 1 is a view in perspective of a toothbrush incorporating the principles of my invention;

Fig. 2 is an enlarged plan view looking down on the unsecured ends of the bristles;

Fig. 3 is an enlarged view in side elevation of the part of the brush shown in Fig. 2;

Fig. 4 is a view in front elevation of the same;

Fig. 5 is a view in front elevation of a brush as it appears when placed on the gums;

Fig. 6 is a view in perspective of the brush in the same position as in Fig. 5; and

Fig. 7 is a view like Fig. 5 but showing the brush as it appears when it is being moved over the gums toward or away from the teeth.

My improved toothbrush includes a handle 10 whose widened forward head portion 11 provides a base for the bristles. A number of holes 12 are bored close together in this base 11, and a tuft of bristles 13 is mounted deep in each one. The holes 12 are arranged in rows which extend parallel to the longitudinal axis of the handle and support the slender bristles close together to accommodate a large number of bristles in each tuft 13 in each of the transversely spaced rows. As shown in Fig. 3, there is a small clearance between adjacent tufts at their base, but at the working ends the tufts tend to merge to form a substantially continuous top surface or series of level surfaces.

The type of bristle is important. As stated above, coarse bristles tend to cause abrasion, and most toothbrushes employ a relatively small number of such coarse

bristles. I employ instead a very slender nylon bristle 15. Preferably, the diameter of each bristle 15 is approximately 0.008 inch, and an advantage of nylon is that each bristle 15 can be made perfectly uniform. If the bristle is much thicker, it tends to be too coarse, and if it is much thinner it tends not to be sufficiently stout or resilient. The bristles may extend approximately $\frac{1}{8}$ " into the holes 12 and project out $\frac{3}{8}$ " to $\frac{1}{2}$ " from the base.

The slender nylon bristles 15 are each very resilient and will give way when they are forced against the teeth instead of remaining upright and scratching the surface of the tooth. Because the nylon bristles do not absorb water, their strength remains fairly constant at all times. This characteristic makes it possible to obtain a brush with sufficient strength made up of slender nylon bristles, by combining a large number of bristles in each tuft.

With each nylon bristle of about 0.008 inch diameter I have found that by combining approximately forty bristles 15 in each tuft 13, and then spacing the tufts 13 in each row as close together as possible, I am able to get the two desirable characteristics of a soft brush that retains its brushing strength and is not harsh.

The bristles 15 in each tuft 13 flare out somewhat, and the upper ends of some bristles 15 in any one tuft 13 will touch the upper ends of some bristles 15 in the adjacent tufts in the same row. The tufts in adjacent rows will either touch each other, or will almost do so, so that when pressure is applied the bristles will tend to support each other as they are deflected.

For an adult's brush I prefer to have four rows of about fifteen tufts 13 each. Thus, in an adult's brush there may be between 2400 and 2500 bristles. A child's brush may have three rows with ten tufts in each row, or about 1200 bristles, and there may be intermediate sizes of brushes.

The brushes should have slender nylon bristles of about 0.008 inch diameter, with many bristles in each tuft, and with the tufts spaced closely together to support each other.

Another important feature is that the brush be trimmed straight across. Every bristle is cut across at the same height as every other bristle and the cut should be substantially perpendicular to the axis of the bristle. The effect of this is to provide the brush with a top surface made up of a mass of flat bristle ends, substantially coplanar with each other.

When such a brush is used to clean the teeth, the bristles give a wiping action instead of a scraping action. The bristles all contact the surface of the tooth or gums, and they deflect together under pressure. This means that in this brush the many bristles transmit each its gentle pressure from the hand to the teeth instead of having a few stiff or long bristles in the center of the tuft of the prior art brush transmit most or all of the pressure.

The result achieved by a tooth and gum massage brush made as above described and clearly shown in the drawings (Figs. 1 to 4) with a plurality of spaced-apart substantially continuous longitudinal rows of soft bristles cut off flat to provide spaced-apart substantially continuous flat gently-yielding gum-contacting surfaces may be described as follows: When the brush is applied with its flat-ended, separated, continuous rows of soft bristles in contact with the gums, the effect is first as shown in Figs. 5 and 6, namely, to cause the gums to be depressed in the spaced-apart linear areas 20, 21, 22 and 23, and to project upwardly between these areas forming the gums into continuous longitudinal ridges 24, 25, 26, 27 and 28. When more pressure is applied to the brush and it is moved across the gums toward the teeth or in the other direction, the effect is as shown in Fig. 7. Each ridge 24, 25, 26, 27 and 28 retains its general form under the influence of the flexed spaced-apart continuous rows of flat-cut soft bristles with the result that there are in a four-row brush, five continuous ridges 24, 25, 26, 27

and 28 filled with a small amount of blood being moved in the gum under the gentle influence of the brush.

Another advantage of this improved brush is that when tooth powder is used the many bristles combine to form at their working ends a plurality of substantially flat surfaces on which the powder can be supported. The powder particles adhere sufficiently so they cannot readily work down through the mass of closely spaced bristles.

Because the nylon bristles are many and distribute the work to many and because they are slender and yield together, the brush of this invention has a very long life by comparison with earlier brushes.

When used to brush the teeth, the improved brush is used in the normal manner. When used to stimulate the gums, the bristles are placed on the gums and pressure is exerted against the handle, at the same time giving a slight rotary motion in a plane normal to the bristles. With sensitive gums, only a mild massage should be given for the first few days, but soon a complete massage can be given, and if the brush is used with normal precautions, the gums cannot be injured. There is no scratching action, but rather a gentle rubbing due to the many flat bristle ends pressing on the gums. Although the feel cannot be fully described, it can be said that it is soft and even. The mass of closely compacted, slender, resilient bristles gives an invigorating stimulus to the gums, just as they produce an even cleansing action on the surfaces of the teeth.

Instead of nylon for the bristles, other non-absorbent synthetic material of like characteristics may be used. Nylon is a product of the E. I. du Pont Company, of Wilmington, Delaware.

I claim:

1. In a mouthbrush adapted for massaging gums as well as cleaning teeth, the combination of a head portion and an elongated handle extending therefrom, at least three transversely spaced rows of bristles, each row of bristles being in a plane parallel to each other, said bristles being soft and resilient and of substantially uniform relatively small diameter having flat trimmed free ends and secured in tufts at their other ends in corresponding rows of holes in said head portion, said holes of each row being closely spaced and parallel to the longitudinal axis of said handle so that the flat trimmed free ends of the contiguous bristles secured in adjacent tufts in each row will touch to form a substantially flat continuous lengthwise working surface along the free ends of said bristles in each row, said rows of holes being transversely spaced for a distance sufficient to provide lengthwise spaces between the flat working surfaces of the bristles in adjacent rows, whereby in use the flat free end working surfaces of the bristles in each row will make substantially continuous equal contact with gums in the direction parallel to the longitudinal axis of the handle and will be out of contact with the gums in the intermediate spaces between the rows of bristles to provide a plurality of lengthwise, spaced apart substantially continuous lines of gentle pressure contact thereon as the brush is drawn thereacross causing alternate depressing and releasing of adjacent lengthwise areas of gum tissue and consequent stimulation and sweeping of blood in gentle amounts in said areas being contacted.

2. The device of claim 1 in which the bristles are made of a synthetic, non-absorbent material in the range of 0.008 inch diameter.

3. The device of claim 2 in which there are approximately 40 bristles in each tuft.

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