



FIG. 8

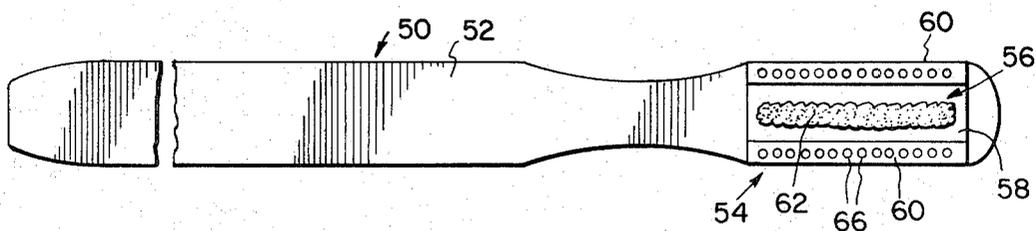


FIG. 9

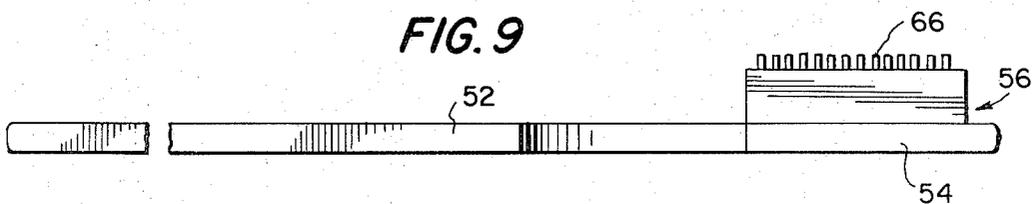


FIG. 10

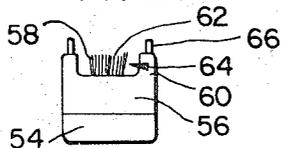


FIG. 6

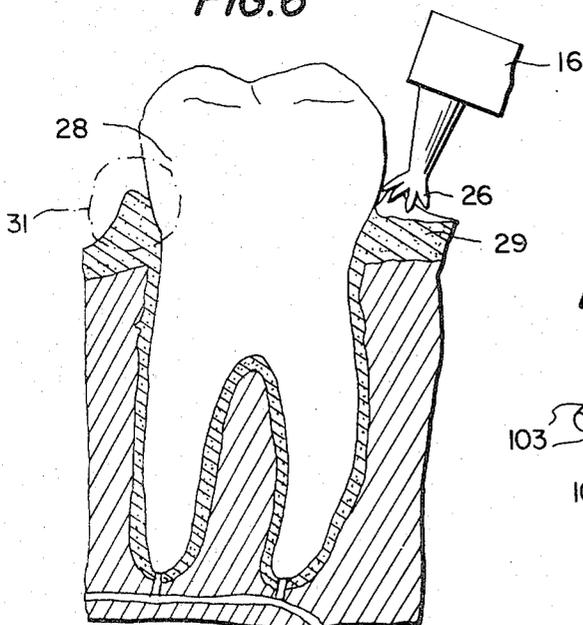


FIG. 5

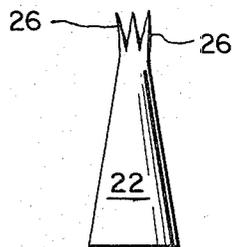


FIG. 11

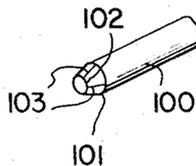
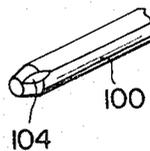


FIG. 12



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3,553,759  
TOOTHBRUSH

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6 Claims

## ABSTRACT OF THE DISCLOSURE

A toothbrush which serves to clean the teeth and simultaneously massage the gums without damaging either the teeth or the gums is disclosed. The toothbrush comprises a handle with a head at one end thereof. The head includes a central bristle section and a pair of longitudinal rows of tips of a soft flexible material, preferably rubber, on either side of the central bristle section and/or alternating rows of bristles and rubber tips. In one embodiment the rubber tips are longer than the bristles, thereby affording protection of the gums from the action of the bristles. In another embodiment the rubber tips are severed into web-like sections to fan out at the outer ends thereof thereby providing a greater surface area for stimulating the gums.

## BACKGROUND OF THE INVENTION

This invention relates to toothbrushes, and more particularly relates to a toothbrush which is effective in cleaning the teeth and massaging the gums while at the same time providing protection for sensitive areas of the teeth and subjacent structures.

In recent years considerable work has been done in the area of oral hygiene, with such work including improvements in both mechanical devices used for cleaning the teeth and in dentifrices. Perhaps the most significant recent improvement in toothbrushes has been the development and extensive marketing of devices which rely on mechanical or electrical energy to transmit motion to a toothbrush having a conventional head. This, of course, allows the user to brush his teeth using an up-and-down or crosswise motion.

While brushing the teeth is a contributory factor to good oral hygiene, stimulation of the gums and subjacent structures is probably more important. Various devices are available for stimulating the gums, including a rubber tip at the handle end of a toothbrush which is manipulated between the teeth and against the gums, and various other such instruments. It has been found, however, that many people will not take the time to properly stimulate their gums or do not have the dexterity to do so properly. This is especially important in the old and handicapped. A need exists, therefore, for a device which would efficiently brush the teeth and stimulate the gums and be easy to use. To this end, it is a primary object of this invention to provide a toothbrush free of the aforementioned and other such disadvantages. Further, it is an object of this invention to provide a toothbrush which combines ordinary bristles for brushing and a means for massaging the gums.

There have been toothbrushes which, in one way or another, combined brushing action with massaging action, but difficulties have arisen in their use involving

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the necessity for brushing in a particular manner and for using extreme care that damage is not done to the tender soft tissue areas with which they come in contact. It is, therefore, another important object of this invention to provide a toothbrush which both brushes the teeth and massages the gums, while affording protection against damage to either the teeth or the gums. More specifically, and consistent with the foregoing objects, it is an important object of this invention to provide a toothbrush which, at the head end thereof, contains a central brush portion surrounded by rubber massaging tips on either side thereof with the rubber tips extending outwardly beyond the bristles of the brush, thereby protecting the gums against the abrasive, or bruising, action of the bristles but at the same time allowing frictional contact of the brush to debride. In accordance with the most efficient use of the toothbrush of this invention, it is yet another object of this invention to provide a toothbrush having a central bristle portion and rubber tips at either side thereof, with the rubber tips extending outwardly beyond the bristles, and with the rubber tips being severed into web-like sections at their ends thereby providing increased surface area to stimulate the tissue by means of its massaging action.

## SUMMARY OF THE INVENTION

In order to implement these and still further objects of this invention, which will become more readily apparent as the description thereof proceeds, it should be recognized that the toothbrush of this invention generally comprises an elongated handle and a head member at one end thereof. The head member comprises a central bristle section and a pair of longitudinal rows of rubber, or other suitable soft, flexible material, tips disposed on either side of the central bristle section, with the rubber tips projecting beyond the outer ends of the bristles. Alternatively, there could be alternating rows of bristles and tips. In a preferred form of the toothbrush, the rubber tips are severed into web-like sections at their outer ends thereby providing increased area for stimulating the gums. The rubber tips are substantially conical in shape or substantially cylindrical in shape in preferred embodiments of this invention.

## BRIEF DESCRIPTION OF THE DRAWINGS

This invention will be better understood, and objects other than those set forth above, will become apparent, when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

FIG. 1 is a plan view of a toothbrush according to one embodiment of the present invention;

FIG. 2 is a cross-sectional view of the toothbrush taken along the line 2-2 of FIG. 1;

FIG. 3 is a side-elevational view of a toothbrush of another embodiment of this invention;

FIG. 4 is the head end of a toothbrush of another embodiment of this invention;

FIG. 5 is an enlarged perspective view of the rubber tip used in the toothbrush of FIG. 3 shown in the "at rest" position;

FIG. 6 is an enlarged perspective view of the tip of FIG. 5 as it appears in contact with the teeth and gums;

FIG. 7 is a perspective view of a toothbrush of another embodiment according to this invention;

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FIG. 8 is a plan view of a toothbrush according to another embodiment of this invention;

FIG. 9 is a side-elevational view of the toothbrush of FIG. 8;

FIG. 10 is an end view of the toothbrush of FIG. 8;

FIG. 11 is a fragmental perspective view of a preferred form of modified tip used according to an additional aspect of the invention; and,

FIG. 12 is a fragmental perspective view of a modified form of the tip shown in FIG. 11.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

The toothbrush generally designated 10 of one embodiment of this invention has an elongated handle 12 and a head portion 14. The head portion 14 has a central bristle section 16 and a pair of longitudinal rows of rubber, or other similar soft, flexible material, tips 18 on either side of the central bristle section 16. The bristles used in the central bristle section 16 are either natural such as boar bristle or artificial such as nylon and are secured to the handle 12 in any manner well-known in the art. Further, the bristles may be arranged in tufts as shown at 20 in FIG. 2 or in any other grouping commonly used in the art. The handle 12 may be clear or opaque, white or colored, plastic or other material commonly used for toothbrush handles. Additionally, the handle can be such as to cooperate with an electrical device, thereby adding the advantages of this invention to an electric toothbrush.

The rubber tips 18 are longer than the bristles 20 and therefore, extend outwardly a greater distance than the bristles. It is well-known that careless brushing with a conventional toothbrush can bruise or otherwise injure gums. With the toothbrush of this invention, however, the soft rubber tips, extending outwardly a greater distance than the bristles, massage the gums and stimulate them while brushing the teeth and at the same time protect the gums from irritation by the bristles. The soft rubber, or other suitable material, tips can be either substantially cylindrical in shape as shown in 18 or substantially conical in shape as shown at 22 in FIG. 3. In either instance, the fact that the rubber tips are longer than the bristles affords important protection of the gums no matter how careless the user might be in brushing.

In FIG. 4 is shown an embodiment which has alternating rows of bristles 19 and rubber tips 21 at the head end 23 of a toothbrush.

In another extremely important aspect of this invention the rubber tips are severed into web-like sections by a slit, or preferably a cross-slot 24 at the tip end thereof which extends downwardly for a distance approximately equal to one-third the length of the bristles. FIGS. 5 and 6 illustrate the purpose of this slit 24 and the appearance of the tip in various phases of its use. The conical tip 22 is used for illustration, but it should be clearly understood that the description applies to the cylindrical tip 18 equally as well.

In FIG. 5 the tip 22 can be seen as it would appear after initial contact with the teeth or gums. The sections 26 formed by the cross-slit 24 have begun to spread. Finally, in FIG. 6 the tip 22 is shown as it would appear while moving over a tooth 28 and gums 29. The sections 26 have spread and deformed due to the contact pressure and the motion, and gently massage, or stimulate, the gums. The cross-slit 24 and the resulting sections 26 afford additional surface area for gentle stimulation of the gums. The important dentino-gingival area is shown as 31.

Turning now to FIG. 7, there is shown another embodiment of this invention. A toothbrush generally designated by the numeral 30 comprises a handle 32 and a head member 34. The head member 34 includes inner portion 36 and outer sleeve portion 38. Inner portion 36 is essentially an extension of handle 32 but is slightly narrower, the width being only sufficient to securely mount the desired amount of bristles 40, preferably two

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longitudinal rows thereof. The outer, slide-on member 38 could be formed of any suitable substance, but it preferably includes a soft rubber body portion 42 with integral upstanding rubber tips 44, the rubber tips 44 being equivalent to either substantially cylindrical tips 18 or substantially conical tips 22. The rubber body member 42 is essentially a hollow sleeve into which inner portion 36 slides and locks by means of a cooperating recess (not shown) inside sleeve member 42. The bottom and sides of inner portion 36 are completely encased by sleeve member 42, which has an open top 48 to allow for the bristles 40 to extend upwardly therethrough as a central bristle section surrounded on either side by the two longitudinal rows or rubber tips 44. As illustrated in this embodiment, as well as the preceding embodiments, it is preferred that each longitudinal row of rubber massaging tips contain five such tips, although it should be clearly understood that this invention is not limited thereto. There should, however, be as many rubber tips on each side as there are groupings of bristles in the case of toothbrushes which contain bristles in tufts or in groupings of tufts as illustrated in FIG. 2. In the case of a toothbrush which contains bristles which appear to be in random placement when observed in a plan view there should be a sufficient number of rubber tips at either side to span essentially the entire length of the central bristle section.

Attention is now directed to FIGS. 8, 9, and 10 wherein there is depicted another toothbrush according to the present invention. The toothbrush generally designated 50 has a handle 52 and a head end 54. On the head end 54 is a base section 56 of a soft, flexible material, preferably rubber. Base section 56 has a central longitudinal recess 58 and a pair of peripheral longitudinal raised portions 60. The bristles 62 are embedded in the recess 58 to form central bristle section 64. The rubber tips 66 are integral with raised portions 60 and can, therefore, be shorter than those of the other embodiments and have firmer support.

FIG. 11 is of particular interest because it shows a modified form of tip for use in accordance with the invention. For convenience, this tip is referred to by the numeral 100, but it is to be understood that this tip could be used in place of, for example, the tips 22 and 66, of other embodiments of the invention. The tip 100 essentially is hollow in nature having at least at the outer end portion 101 thereof a recess or bore 102 and a plurality of slits 103. With this arrangement, the segmental portions of the tip 100 which are disposed in surrounding relation to the bore or recess 102 can flex outwardly quite easily thus achieving the same desirable results in a somewhat simplified manner from the tip 22. To enhance the operation and appearance, the tip 100 can be further recessed adjacent the slits 103 as shown in FIG. 12 at 104. In this arrangement, there is a spacing at the outer end of the slit so that the segments of the tip essentially form soft teeth.

Clinical evaluation of the toothbrush of this invention shows a combined brushing and stimulating action. The combination of conventional bristles and rubber tips which are severed into web-like sections serve to debride the tissue and at the same time to stimulate the same. The stimulation effected by the rubber tip increases the circulation in the area thereby causing a more rapid exchange of waste products from, and food products to, the area by means of the blood vessels that supply the area and periodontium. The teeth have a very rich blood supply as was well shown by Cohen and Keller in their ink perfusion studies, thereby showing definite advantages to stimulation. Brill and Krasse showed exchange between gingival crevices and stimulation would increase that exchange. Any method of toothbrushing is acceptable and efficient since the bristles are oriented in such a way, along with the protection of the rubber tips, as to provide an efficient and safe instrument for debridement.

The obvious advantage attaching to the toothbrush of this invention is that an elderly person who has lost considerable dexterity, the physically handicapped, and the person who does not understand the objectives of oral physiotherapy and finds it an imposition to carry through sophisticated brushing techniques, can easily and efficiently tend to his oral hygiene.

In a preferred method of use of the toothbrush of this invention, a disclosing tablet is used to illustrate areas of debris followed by a simple scrub-brush technique without traumatic effects to the tissue. The disclosing tablet is simply chewed by the user wherein debris takes on a red color thereby indicating to the user the areas which most need brushing. In comparing the toothbrush of this invention with conventional toothbrushes, various patients used disclosing tablets to indicate the areas of debris followed by brushing with either a conventional toothbrush using the recommended brushing techniques of the literature or with the toothbrush of this invention using the recommended brushing techniques and using a simple scrub-brush technique. It was found that a simple scrub-brush technique with the toothbrush of this invention was as effective as the various recommended techniques with conventional toothbrushes. There was no abrasion to the tissue or frictional irritation to the cervical areas of the teeth to which one is often exposed due to recession or irritation by normal brushing. This was due to the protective capacity of the rubber tip on the borders of the brush. There is no doubt that this toothbrush serves the dual purpose of a physiological stimulator and a mechanical debriding apparatus. This, of course, is based on the accepted concept that along with mechanical debridement of local irritants such as food, calculus, and materia alba, stimulation is needed to supplement in order to create an optimum circulatory (vascular) environment for healthful tissue metabolism.

It should be apparent from the foregoing detailed description that the objects set forth at the outset to the specification have been successfully achieved. Moreover, while there is shown and described present preferred embodiments of the invention, it is to be distinctly understood that the invention is not limited thereto, but may be otherwise variously embodied and practiced within the scope of the following claims.

Accordingly, what is claimed is:

1. In a toothbrush comprising a handle part and a

head part at one end thereof, the improvement comprising said head part having:

- (a) a plurality of longitudinally aligned rows of bristles;
  - (b) a plurality of longitudinal rows of tips of soft, flexible material disposed alternately of each longitudinal row of bristles;
  - (c) each of said tips including at least one transverse slit therein to permit independent flexing of the portions of said tips separated by said slit.
2. The improvement of claim 1 wherein said tips comprise rubber tips.
  3. The improvement of claim 1, wherein said tips are substantially conical in shape.
  4. The improvement of claim 1, wherein said tips are substantially cylindrical in shape.
  5. The improvement of claim 1, wherein said tips are integral with a removable sleeve adapted to encase said handle at the head end thereof.
  6. The improvement of claim 1, wherein said head part includes a rubber portion having a longitudinal centrally recessed portion and peripheral longitudinal raised portions, said bristles being embedded in said recessed portion, and said tips being integral with said peripheral longitudinal raised portions.

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U.S. Cl. X.R.

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