United States Patent

Brockman

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[54] TOOTHBRUSH

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[52] **U.S. Cl.** ..... **128/62 A,** 128/65, 15/167 A, 15/27, 401/28

[51] **Int. Cl.** **A61h 7/00**

[58] **Field of Search** ..... 128/62 A, 67, 65; 15/167 A, 15/27; 401/28, 34, 35

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[57] **ABSTRACT**

A toothbrush head having a pair of spaced, rotatable, hollow, generally conical implements mounted thereon for simultaneously cleaning the teeth and massaging the gums of the user. The conical implements are composed of rubber or other suitable resiliently yieldable material adapted to be pressed against and conform to the contours of the user's teeth and gums. The walls of the implements are corrugated and comprise a series of annular accordion pleats decreasing in cross section away from the head and terminating in bulbous formations. A plurality of perforations extend through the corrugated walls of the implements. The other ends of the implements are provided with shafts having axially extending shanks releasably secured into diametrically opposed gears meshing with a central idler gear captively received in the head of the toothbrush.

9 Claims, 5 Drawing Figures

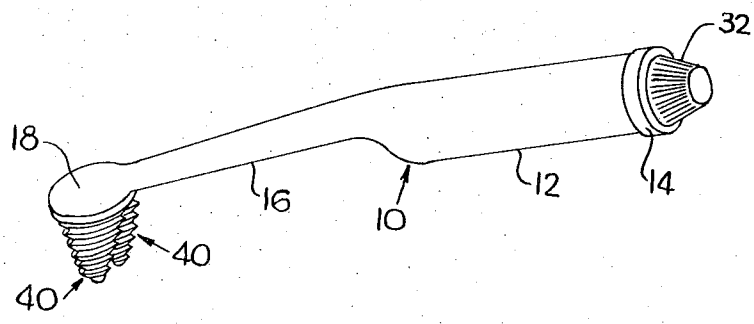
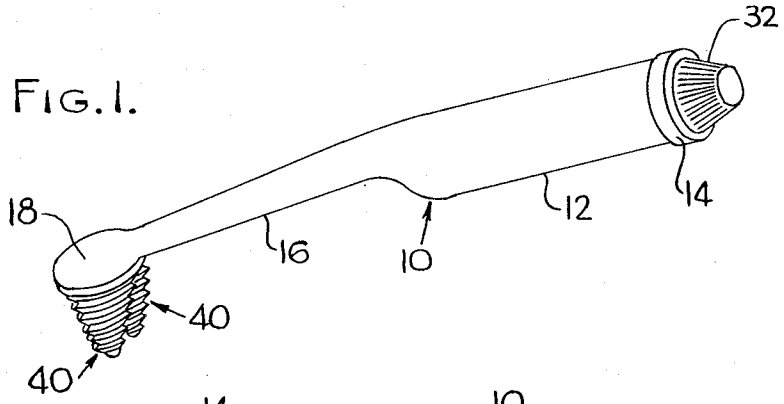


FIG. 1.



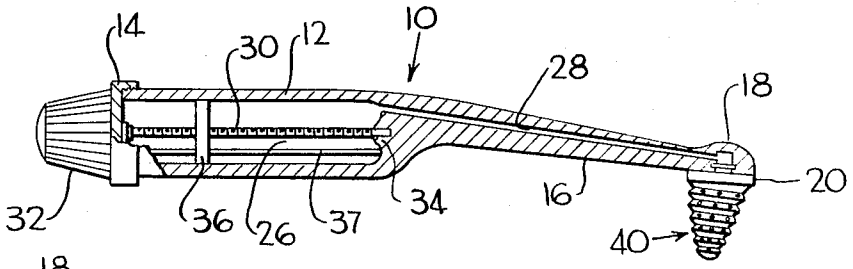


FIG. 2.

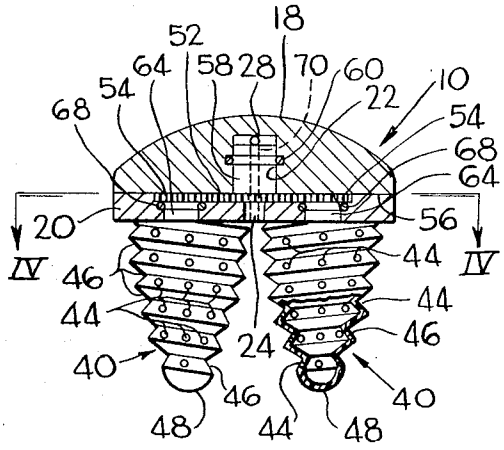


FIG. 3.

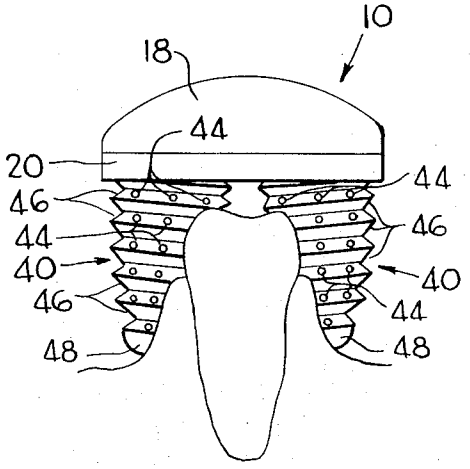


FIG. 5.

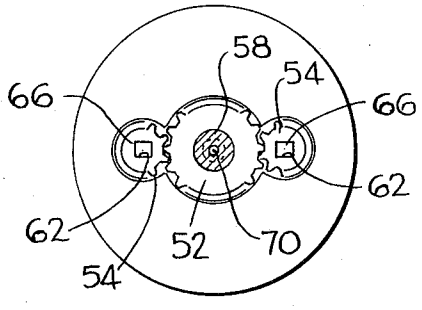


FIG. 4.

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TOOTHBRUSH

BACKGROUND OF THE INVENTION

This invention relates to a toothbrush and, more particularly, to a toothbrush head having novel tooth and gum engaging implements.

It is well known today that in order to preserve a strong, healthy set of teeth, it is necessary to maintain the gum tissue in which the teeth are embedded in a healthy condition as well as the teeth themselves. A common method of treating such gum tissue is regular massage. Various types of toothbrushes having separate tooth cleaning and gum massaging elements are well known, the conventional types having these elements disposed at opposite ends of the toothbrush handle. Accordingly, these elements must be used separately and independently of each other so that very often the user is negligent in employing the gum massaging element.

Powered toothbrushes having various tooth cleaning and gum massaging attachments also are well known. While many such powered toothbrushes are admirably suited for their intended purposes, they possess certain disadvantages. For example, the attachments must be used separately so that the user may not always be diligent in employing the gum massaging attachment. Also, these powered toothbrushes require a power source and incorporate a complex arrangement of mechanical parts, which are expensive and subject to wear and failure.

SUMMARY OF THE INVENTION

The toothbrush of the present invention, as hereinafter described, obviates the above deficiencies by providing an improved toothbrush, which is simple and strong in construction, durable and rugged in use, relatively low in cost as compared to powered toothbrushes, and which includes a novel head having a pair of removable conical implements which serve to simultaneously clean the teeth and thoroughly massage the gums of the user.

Generally speaking, the toothbrush of the present invention comprises a toothbrush head having a pair of spaced, rotatable, hollow, generally conical tooth and gum engaging implements mounted thereon. The conical implements are formed of a resiliently yieldable material adapted to be pressed against and conform to the contours of the user's teeth and gums. The walls of the implements are corrugated and comprise a plurality of annular accordion pleats diminishing in cross section from the head downwardly and terminating in a bulbous formation. A plurality of perforations extend through the walls of the implements.

Rotation of the conical implements is effected by frictional engagement of the same with the user's teeth when the toothbrush is moved horizontally along a row of teeth, the lower portions of the implements engaging the gums to massage the same. Reciprocating the toothbrush along the teeth collapses and expands the implements in response to changing tooth contour. Thus, the same elements simultaneously clean the teeth and massage the gums of the user.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of one form of toothbrush constructed in accordance with this invention;

FIG. 2 is a longitudinal sectional view, partially in side elevation, of the toothbrush of FIG. 1;

FIG. 3 is a transverse cross-sectional view taken through the head of the toothbrush of FIG. 1;

FIG. 4 is a cross sectional view, taken on line 4—4 of FIG. 3; and

FIG. 5 is a front elevational view of the toothbrush head of FIG. 3, showing the brushing implements engaging the teeth and gums of a user.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now in detail to the drawings, there is shown in FIG. 1 a preferred embodiment of a tooth brush, generally designated 10 and constructed in accordance with this invention, comprising a tubular or cylindrical hollow body 12 having an end cap 14 threaded on one end thereof and a neck portion 16 of reduced diameter extending from the other end and formed integral therewith. Although the body 12 of the embodiment illustrated herein is generally cylindrical, it should be understood that it may take other shapes and forms, as desired, within the purview of this invention. Likewise, while the cross sectional configuration of the neck portion 16 is shown as somewhat elliptical and gradually tapering longitudinally away from the body 12, it too can vary in shape or form, as desired.

The neck portion 16 terminates in a head formation 18 having a base plate 20 rotatably secured to the bottom of the head formation 18. The head formation 18 has a cavity 22 communicating with a central opening 24 in plate 20 for a purpose that will hereinafter become apparent.

The hollow body 12 serves as a convenient hand grip for the toothbrush and defines a chamber or reservoir 26 for a dentifrice to be dispensed. An elongated passage 28 extends axially through the neck portion 16 connecting the reservoir 26 to the cavity 22.

Means are provided for dispensing the material from reservoir 26, such means comprising an elongated threaded rod 30 extending axially through the reservoir 26, through end cap 14, and rigidly secured at its outer end to a rotatable knob 32 for rotation thereby. The inner end of rod 30 is received in a recess provided in an end wall 34 of body 12 and is restrained against axial movement. A piston or plunger 36 is threaded on rod 30 and is moved axially upon rotation of the latter to force the dentifrice from reservoir 26, through passage 28 and into cavity 22. Piston 36 is preferably provided with a peripheral projection engaging a keyway 37 in body 12 to restrain the piston against rotation.

In accordance with the present invention, a pair of rotatable, generally conically shaped tooth and gum engaging implements 40 are mounted in the plate 20 of head formation 18 as will hereinafter be described. These implements 40 are hollow as shown in FIG. 3 and are provided with walls 42 having a plurality of perforations 44 extending therethrough. The walls 42 are corrugated and comprise a plurality of annular accordion pleats 46 progressively decreasing in diameter toward their free ends and terminating in bulbous formations 48. The implements 40 preferably are formed of rubber or any other suitable resiliently yieldable elastic material capable of collapsing upon the application of an axial pressure and deformable in any plane in which a force is applied. Because of the resiliency of the material of which implements 40 are formed, they will return to their original configurations upon the removal of any force applied thereto.

A recess is formed in the upper surface of plate 20 for receiving a gear assembly comprised of a central idler gear 52 and two pinions 54 meshing with the gear 52 at diametrically opposite sides thereof as shown in FIG. 4. The gear assembly is captively held in place in the recess by the lower flat surface 56 of the head formation 18. The gear 52 is provided with a shaft 58 extending upwardly into the cavity 22 but spaced from the upper end wall thereof and held in place by means of a retainer ring 60. Each of the pinions 54 is provided with a central opening 62 of a generally square shape for a purpose that will be presently apparent.

Each implement 40 is provided with a shaft 64 extending through a complementary opening in base plate 20, such shaft 64 having a shank 66 extending axially from the end of shaft 64 opposite implement 40. The shank 66 is of generally square cross sectional configuration so as to fit snugly in the opening 62 of gear 54. Of course, the shape of openings 62 and shanks 66 may be of any desired cross sectional configuration, so long

as they are complementary to each other. A retainer ring **68** holds each shaft **64** in place. Thus, the implements **40** are releasably mounted in the plate **20** with a snap fit and can be readily removed when the toothbrush is not in use for cleaning and storage.

A passage **70** extends axially through the shaft **58** of gear **57** and communicates with the opening **24** in plate **20**. Thus, the dentifrice fed into the upper portion of cavity **22** passes through the passage **70** and opening **24** into the space between the teeth and gum engaging implements **40**.

In order to fill the reservoir **26** with dentifrice, the end cap **14** is threadably removed and the paste dispensing mechanism, including rod **30** and plunger **36**, may be axially withdrawn. The reservoir **26** can then be filled with dentifrice and the dispensing mechanism inserted back into body **12** with the cap **14** threaded thereon. To dispense dentifrice, the knob **32** is manually rotated, thereby rotating rod **30**. Since the rod **30** is restrained against axial movement, the plunger **36** will move axially toward the head formation **18** and force the material from reservoir **26** through passage **28**, the top of cavity **22**, through passage **70** and outwardly through opening **24** between the spaced implements **40**.

In use, the toothbrush **10** is inserted into the user's mouth with the implements **40** disposed on opposite sides of the teeth and the lower ends thereof engaging the adjacent gum region. The material of which implements **40** are formed is sufficiently soft to conform to the teeth and gum contours so as to engage substantially the entire surfaces thereof. The knob **32** may be rotated to deposit any amount of paste material desired onto the teeth and gums. By moving the toothbrush along a row of teeth, the frictional engagement of the conical implements **40** against the teeth and gums effects rotation of the implements **40** to thoroughly clean the teeth and massage the gums. As shown in FIG. **4** the idler gear **52** causes both gears **54** to rotate in the same direction, which may be counterclockwise as illustrated in FIG. **4** when the toothbrush is moving along the teeth in one horizontal direction, and clockwise when the toothbrush is moving in the reverse horizontal direction.

It will be noted that the assembly comprising plate **20**, gear **52**, pinions **54**, and the implements **40**, is connected to head **18** in a freely rotatable manner by shaft **58** and snap ring **60** so that this assembly may swivel freely as the device is moved along a row of teeth, so that the pair of implements follows the interior and exterior surfaces of the tooth and gum formations of the user.

To clean the implements **40** the ends **48** thereof may be alternately pressed against a surface, preferably under water as in a wash basin, whereupon the corrugated implements **40** will expand and collapse in accordion fashion to create a pumping action effecting an alternate suction and expiration through the perforations **44** to thoroughly flush the implements **40**.

The present invention thus provides a simple toothbrush having a novel head on which are detachably mounted a pair of spaced, rotatable, hollow, generally conical tooth and gum engaging elements formed of a resiliently yieldable material for simultaneously cleaning the teeth and massaging the gums of the user. An illustrative embodiment of this invention having been herein described and illustrated in the drawing, it is to be understood that numerous modifications thereof can be made without departing from the spirit and scope of this invention.

I claim:

1. A toothbrush comprising: a body, a neck portion formed integral therewith and terminating in a head formation, a pair of spaced tooth and gum engaging implements, means rotatably mounting said implements on said head, each of said implements comprising a resilient conical body and the two conical bodies being spaced to simultaneously engage the interior and exterior surfaces of the teeth and gums of a user, said implement mounting means being free to swivel relative to said head to follow freely along a curving row of teeth as the device is moved to and fro by a user.

2. A toothbrush according to claim **1** wherein each of said conical bodies is hollow and is provided with a plurality of perforations extending through the wall of said body.

3. A toothbrush according to claim **1** wherein each of said conical bodies is provided with a corrugated wall providing a series of annular accordion pleats.

4. A toothbrush according to claim **1** wherein each of said bodies is composed of rubber.

5. A toothbrush according to claim **1** wherein each of said conical bodies is provided with a shaft at the large end thereof, said shaft having an axially extending shank releasably secured to said implement mounting means.

6. A toothbrush according to claim **1** wherein said implement mounting means comprise a gearing arrangement captively held in said head formation and comprising a central gear and a pair of diametrically opposed pinions meshing with said central gear.

7. A toothbrush according to claim **6** wherein said bodies are provided with shafts at the large ends thereof, said shafts having axially extending shanks releasably secured in corresponding openings in said pinions.

8. A toothbrush according to claim **1** wherein said toothbrush body defines a reservoir for containing a dentifrice, and passage means leading from said reservoir outwardly between said spaced implements.

9. A toothbrush according to claim **8** wherein said body is provided with means for dispensing the dentifrice from said reservoir.

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