



US 20030033682A1

(19) **United States**

(12) **Patent Application Publication**
Davies et al.

(10) **Pub. No.: US 2003/0033682 A1**

(43) **Pub. Date: Feb. 20, 2003**

(54) **TOOTHBRUSH**

(30) **Foreign Application Priority Data**

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Aug. 14, 2001 (EP) 01306931.5

Publication Classification

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(51) **Int. Cl.⁷** **A46B 9/04**

(52) **U.S. Cl.** **15/110; 15/167.1; 601/141**

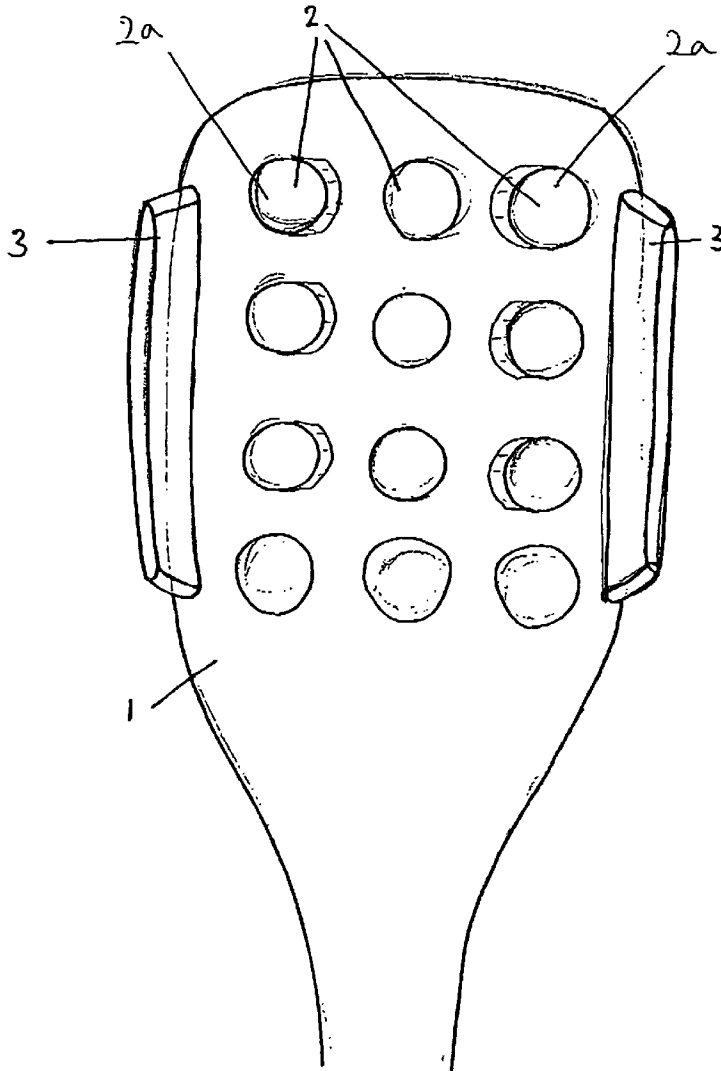
(57) **ABSTRACT**

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Toothbrush comprising a head and a handle, the head comprising massaging wings extending from a bristle-bearing face said massaging wings flanking a central bristle area and angled outwardly from said area, wherein the bristles are arranged in bristle tufts and of the bristle tufts which are adjacent a wing, at least a portion are angled towards said wing.

(21) Appl. No.: **10/214,633**

(22) Filed: **Aug. 8, 2002**



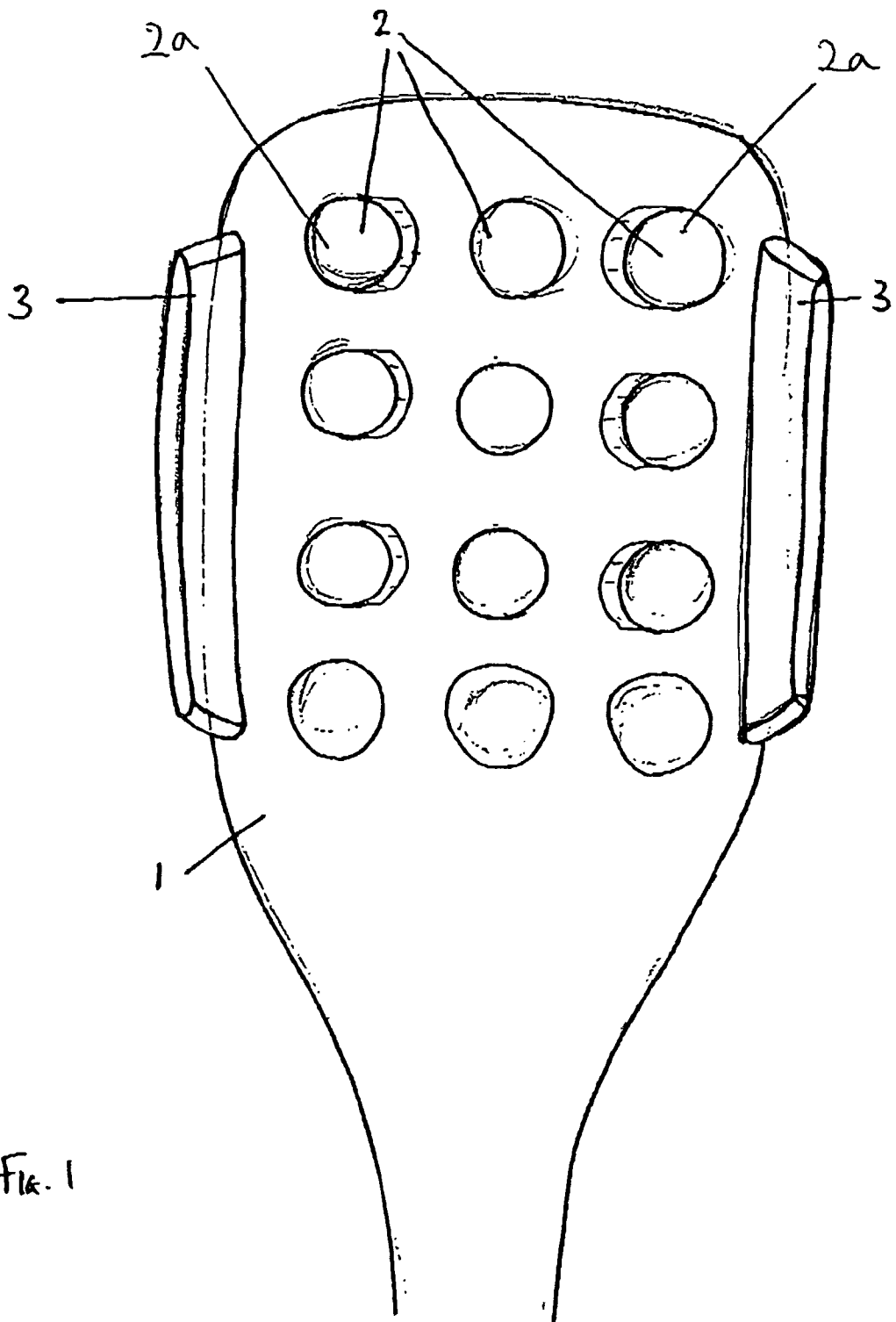
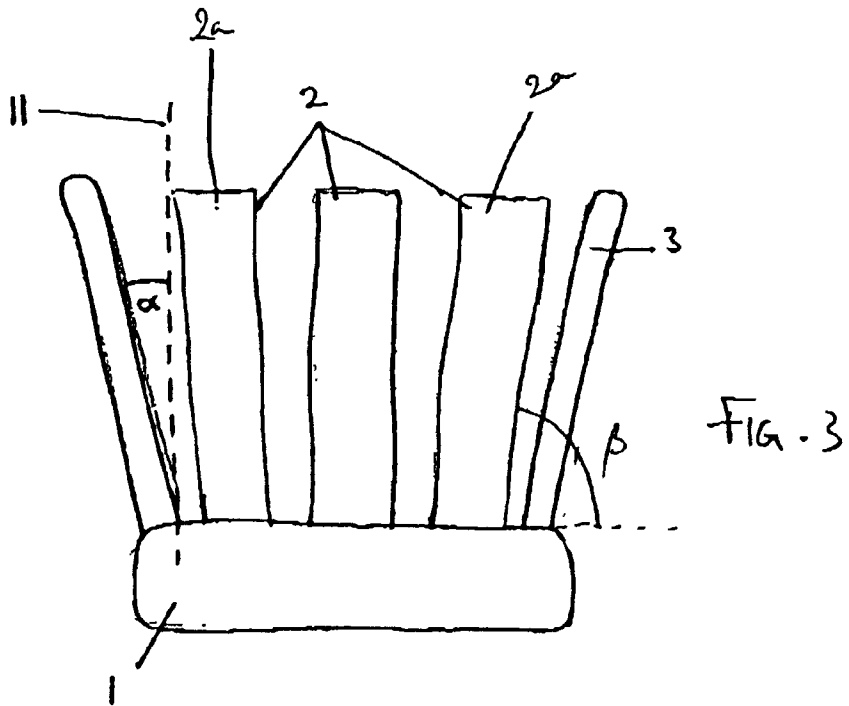
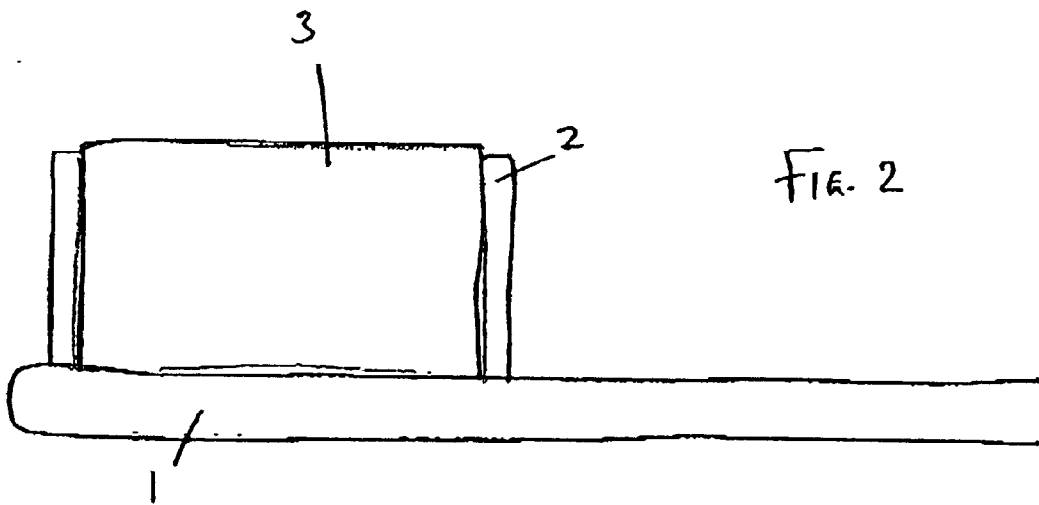
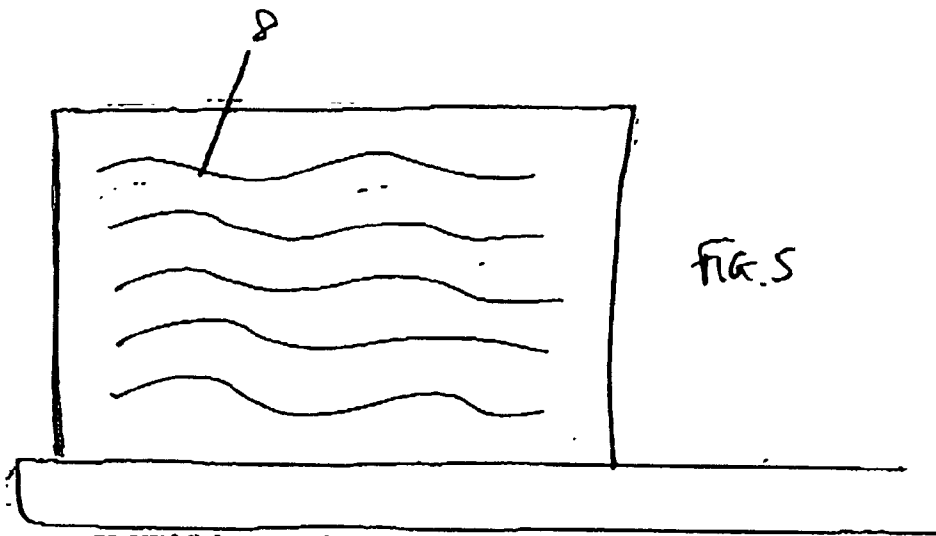
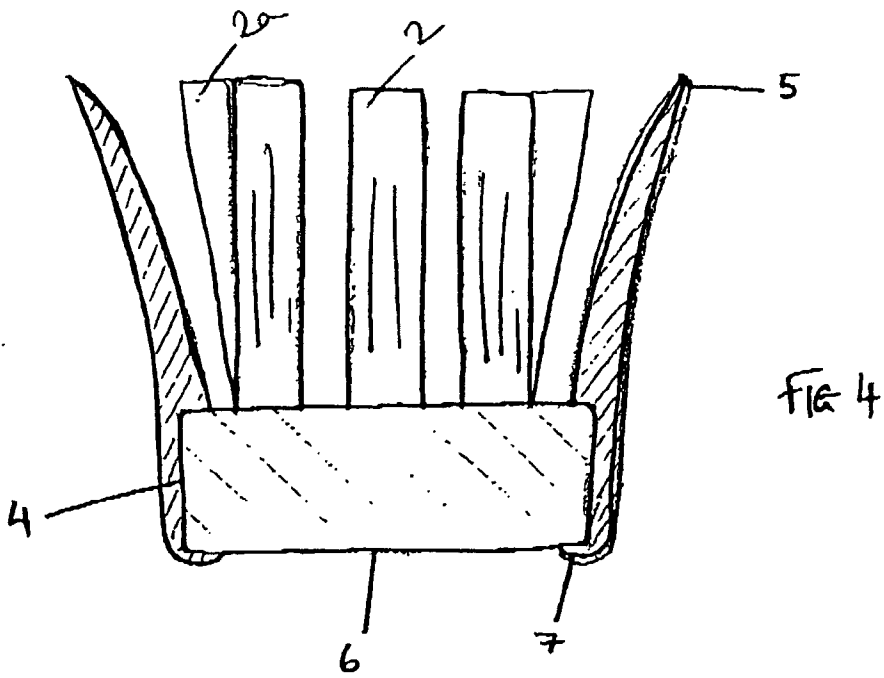


Fig. 1





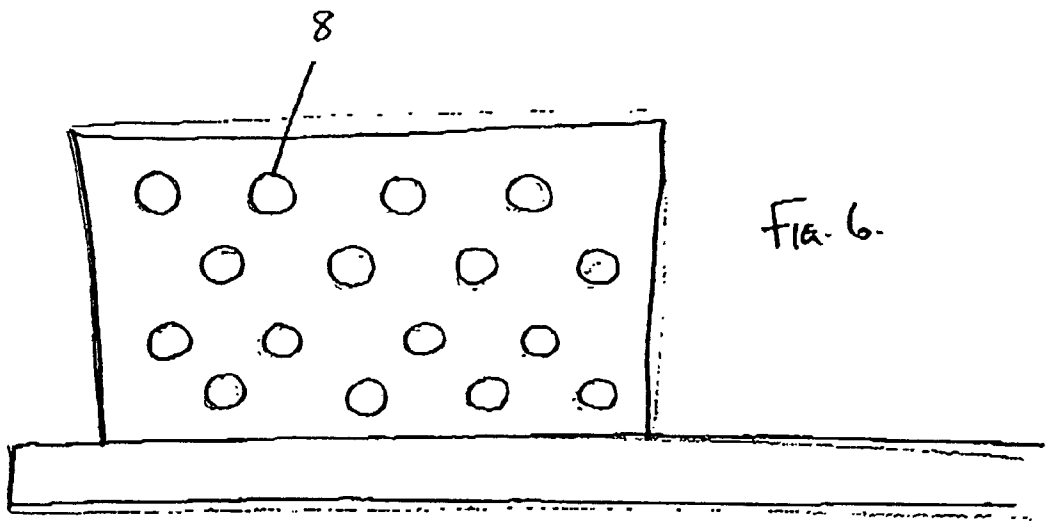


Fig. 6.

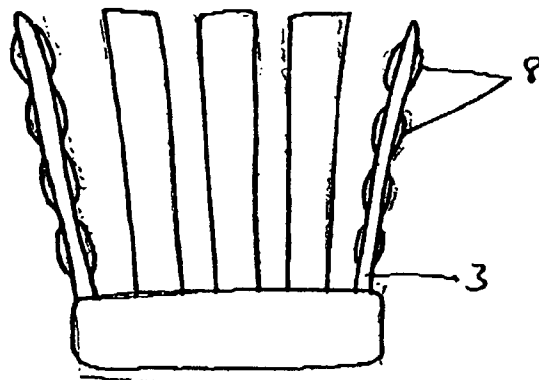


Fig. 7

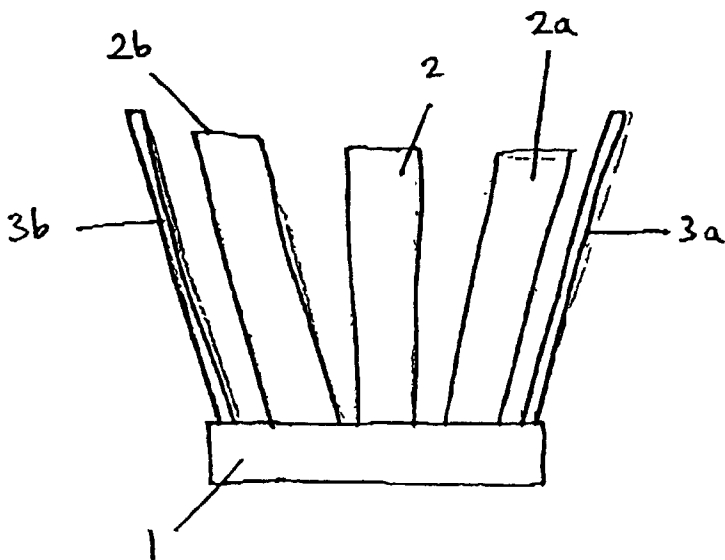


Fig. 8

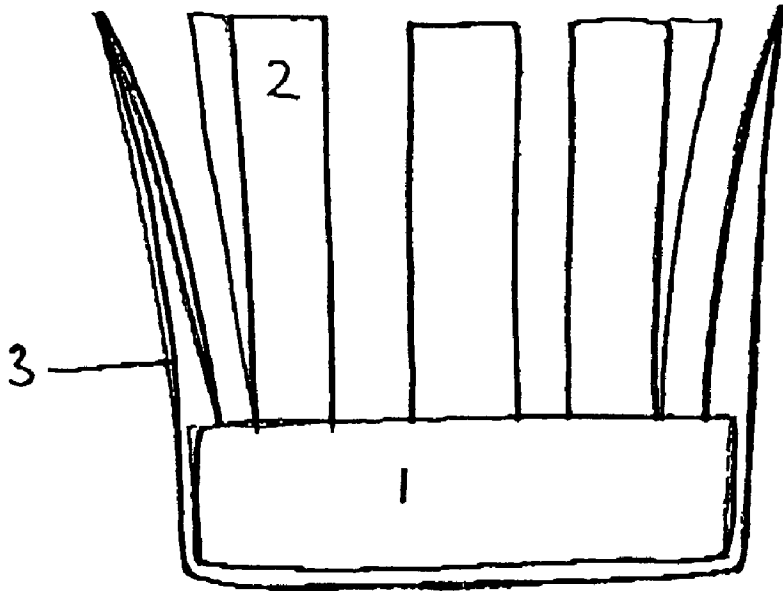


Fig. 9

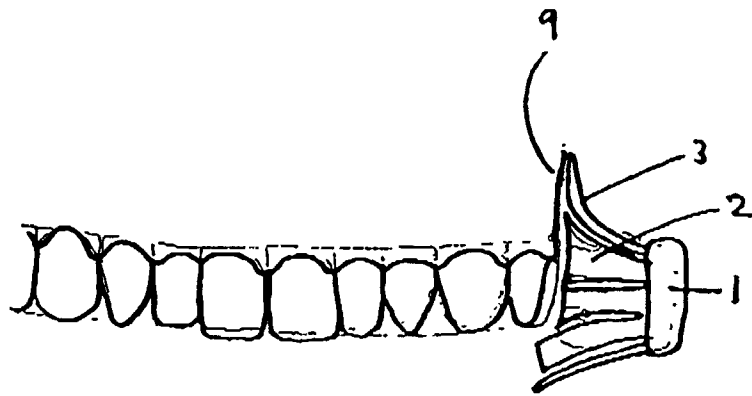


Fig. 10

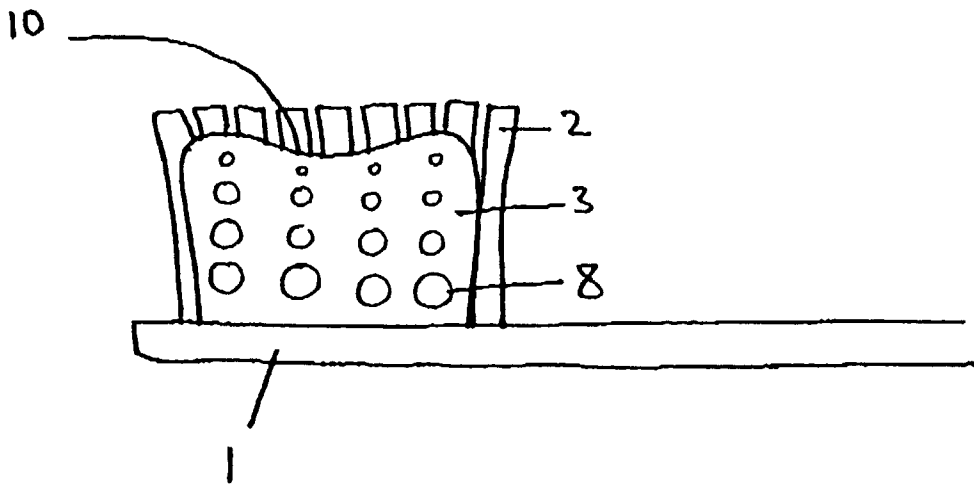


Fig. 11

TOOTHBRUSH

[0001] The present invention relates to a toothbrush comprising massaging elements.

THE PRIOR ART

[0002] Toothbrushes comprising rubbery massaging elements are known in the art. Typically, these comprise rubbery fingers which, either alone or in combination with conventional bristle tufts, project from the bristle-bearing surface in the normal fashion and exert their massaging action during brushing.

[0003] WO 98/18364 (P&G) describes a toothbrush with combination of bristles, soft cleansing pad and/or polishing fingers. The polishing fingers are preferably made of a thermoplastic elastomer and the soft polishing pad is an absorbent pad capable of providing an improved cleaning benefit.

[0004] GB-A-2 040 161 (Vowles) describes an improved toothbrush comprising, in addition to conventional bristles tufts, a gum massaging member located outermost on opposite sides of the brushing surface.

[0005] WO 98/22000 (Asher) discloses a toothbrush comprising a plaque removing member being formed from a mixture of relatively soft elastomeric material and particles of an abrasive material.

[0006] WO 01/21036 (Unilever) discloses a toothbrush comprising a wall-like member which is flanked by bristles. The wall-like member is designed so as to provide improved polishing to the teeth during brushing.

[0007] DE 299 19 122 (Teske) discloses a toothbrush comprising a pair of gum massaging members either side of a central bristle area and wherein the wings are angled outwardly of the bristles.

[0008] Despite the prior art there remains a consumer need to improve the health of the gums without having to receive specialist treatment, such as a mouthwash or an antibacterial toothpaste.

STATEMENT OF INVENTION

[0009] The present invention aims to provide an improved massaging effect of a toothbrush, which also has a conventional cleaning action through the use of conventional bristles.

[0010] Accordingly, the present invention provides a toothbrush comprising a head and a handle, the head comprising massaging wings extending from a bristle-bearing face said massaging wings flanking a central bristle area and angled outwardly from said area, characterised the bristles are arranged in bristle tufts and of the bristle tufts which are adjacent a wing, at least a portion are angled towards said wing.

DESCRIPTION OF INVENTION

[0011] The toothbrush according to the invention comprises massaging wings which are angled outwardly from the bristles. Such an arrangement facilitates the massaging effect of the wings while at the same time allowing the conventional bristles of the brush to exert their regular cleaning action. The feature which leads to an improved

cleaning effect of the toothbrush is where the conventional bristles, particularly the conventional bristles which are nearest the massaging wings, are angled outwardly. A disadvantage of having a brush which has massaging elements at the sides is that the cleaning action of the conventional bristles is easily compromised by including either not enough bristles, therefore not providing enough of a cleaning benefit, or including the same number of bristle as would normally be presented on a toothbrushing surface but not giving them enough room to effect their action. By angling the conventional bristles in between the massaging wings allows the bristles to splay more during brushing. This angling of the bristles, at least of the outermost bristles, also has the added benefit of a better perception of brushing by the consumer.

[0012] The massaging wings should be angled relative to a plane, which extends orthogonally from the bristle-bearing surface and longitudinally down the brush head. Preferably, the wings should be angled from 1 to 30°, more preferably from 2 to 20° and more preferably from 2.5 to 7° relative to said orthogonal plane.

[0013] In an alternative embodiment, the toothbrush according to the invention comprises a head with a massaging wing, which has an outer surface and an inner surface and extends from a base to a tip, wherein the base of the wing sits on an outer edge to the toothbrush head. Such a construction allows the maximisation of the space on the bristle-bearing surface for conventional bristles. As mentioned below, it is of great importance that the cleaning effect of the bristles is maintained and that the space taken up by the massaging wings is minimised as much as possible. In a particular embodiment the outer surface of the massaging wings continues down from its tip down past the bristle-bearing surface of the brush head base such that the outer surface of the wing actually provides the edge of the brush head. The massaging wing may continue in its path along its outer surface such that it passes around the edge of the head. It may then either finish at some point on the bottom surface of the head or even to continue such that a pair of wings on either side of the head may then be connected to each other on the underside of the brush head base. Preferably, said wings may join at a tip region of the head so that a buffering effect may be provided to reduce damage to the gums during brushing.

[0014] In a preferred embodiment the brush comprises an array of bristle tufts some of which will necessarily be adjacent the massaging wings. Preferably, a portion of these adjacent bristle tufts are also angled with respect to said orthogonal plane and in a direction towards the adjacent massaging wing. In this way the brushing characteristics of the brush can be improved without compromising the effect of the massaging wings. As mentioned above, it is a problem with brushes comprising massaging members that they often do not provide an acceptable level of cleaning since the numbers or arrangement of bristles is not optimal. However, by splaying these adjacent bristles in a similar fashion to the massaging wings an improved bristle arrangement can be provided. Typically, these bristle tufts will be angled from 1 to 30°, more preferably from 2 to 20° and more preferably from 2.5 to 7° relative to said orthogonal plane.

[0015] The inner surface of the massaging wing preferably passes from the tip down to the brush head and is attached

to the edge of the brush head base. The wing may be attached to the edge of the brush base merely as a result of the manufacturing process, e.g. by injection moulding, or even by an adhesive. In any case, the attachment of the wing to the brush head base may be improved by way of surface formations, such as corrugations, on the brush head, which may increase the surface area of the edge in contact with the wings. In a preferred embodiment the inner surface of a massaging wing sits on a stepped ledge on the edge of the brush head base. The ledge may run for a part or the whole length of the wing on the brush head.

[0016] The material comprising the wing comprises an elastomeric material such as those often used in toothbrush manufacture. The thermoplastic elastomer which forms the wall may be a thermoplastic vulcanate (TPV) consisting of a mixture of polypropylene and EPDM (ethylene propylene diene monomers) which is available as Santoprene (brand), described in U.S. Pat. No. 5,393,796 issued to Halberstadt et al, or Vyram (brand), another TPV consisting of a mixture of polypropylene and natural rubber, both Santoprene and Vyram (brands) being elastomers marketed by Advanced Elastomer Systems. Other suitable elastomers include Kraton, a brand of styrene block copolymer (SBC) marketed by Shell, and Dynaflex G 2706 (brand), a thermoplastic elastomer marketed by GLS Corporation and which is made with Kraton (brand) polymer. Other thermoplastic compounds include base:styrene block co-polymer (SEBS) e.g. Thermolast K from Gummiwerk Kraiberg (GmbH) or PONA-flex S from PLASTOLEN (GmbH).

[0017] Preferred elastomeric materials include those with a Shore A hardness ranging from 10 to 40, preferably from 15 to 30 and more preferably from 17 to 23 and especially preferably around 20.

[0018] In a preferred embodiment at least one massaging wing has surface formations which improve the massaging effect of the wings on the gums. Preferably, said surface formations are present on one or both of the inner and outer surfaces of the massaging wings. Preferred surface formations include raised spherical, square, egg-shaped, triangular or wavy formations. The most preferred formations are spherical formations. Preferably the surface formations extend from 10 to 90% of the width of the wing at the level at which the particular formation is located. For example, at one point down its length the wing may be 1 mm wide in cross section.

[0019] At this point on the wing surface the surface formation may extend from 0.1 mm to 0.9 mm from the surface of the wing.

[0020] In another embodiment the wings extend below the brush head such that they have an increased contact with the material of the brush head to improve bonding between the two materials. There is a danger when using a brush such comprising such wings in that the wings, which are bent outwardly during use, may become detached from the head. By increasing the surface contact between the wing and the head one can reduce the chances of such breakage.

[0021] In yet another embodiment the brush according to the invention comprises a bristle profile which closely matches the profile of the massaging wings. This does not necessarily mean that the wings need to extend from the bristle-bearing surface to a similar extent to the bristles, but

only that the profile of each matches. This helps to avoid an excess of bristle cleaning where no massaging is taking place and also prevents the wings being buffeted by the bristles during use.

[0022] In a preferred embodiment the massaging wings extend for a distance equal to from 60 to 120% the length of the average bristle tuft on the head. Preferably, the wing extends for a distance equal to from 65 to 95, more preferably from 70 to 85 and especially about 75% of the length of the average bristle tuft. Where the wings are shorter than the average bristle length the wings are less likely to be buffeted by the bristles during use and are able to exert their massaging action without affecting the cleaning efficacy of the bristles on the teeth.

[0023] In an alternative embodiment the massaging wings are profiled in a way that they present an uneven tip edge so as to present an uneven massaging capability. This helps to improve the sensation of massaging which would otherwise be reduced should the tip profile be even. Preferably the tip profile includes a raised section at either end with a recess in the middle.

DETAILED DESCRIPTION OF INVENTION

[0024] Particular embodiments according to the invention will now be discussed in more detail with reference to the following non-limiting figures in which

[0025] FIG. 1 is a plan view of a brush according to the invention and

[0026] FIGS. 2 and 3 are elevation and end views of the embodiment according to FIG. 1.

[0027] FIG. 4 is an end view of another embodiment;

[0028] FIGS. 5, 6 and 7 are embodiments exhibiting surface formations;

[0029] FIGS. 8 and 9 are end views of preferred embodiments;

[0030] FIG. 10 is a view of the brush during use and

[0031] FIG. 11 is an elevation of the most preferred embodiment.

[0032] FIG. 1 discloses a brush head (1) according to the invention comprising bristle tufts (2) projection from said head and a pair of outwardly extending massaging wings (3). Bristle tufts (2a) adjacent the wings (3) are also angled towards said wings (3).

[0033] FIG. 2 discloses a brush head (1) comprising a massaging wing (3) and conventional bristle tufts (2).

[0034] FIG. 3 discloses a brush head (1) comprising a pair of massaging wings (3) and conventional bristles (2). The wings are angled by α° relative to the plane (11) running orthogonally from the bristle-bearing surface and longitudinally down the brush head. The angled bristle tufts (2a) are also angled by β° relative to the brush head surface from which they extend.

[0035] FIG. 4 discloses another embodiment according to the invention in which the massaging wings sit over the edge (4) of the brush head and are tapered towards their tips (5). In addition the base end of the massaging wings (7) extend around the edge of the brush head and form tabs on the

surface (6) of the brush head opposite the bristle bearing face. This embodiment provides improved grip between the material of the wings and the material of the brush head.

[0036] FIG. 5 discloses a brush head comprising a massaging wing which has surface formations (8) thereon for improving the sensory experience of the consumer. The surface formations (8) are in the form of ridges running along a length of the wing.

[0037] FIG. 6 also discloses a brush head comprising a massaging wing with surface formations (8) which are in the form of raised spherical regions.

[0038] FIG. 7 discloses a brush head according to FIG. 6. The surface formations (8) are present on both sides of the wings (3).

[0039] FIG. 8 discloses a brush head comprising a pair of outwardly extending massaging wings (3a/3b) and bristle tufts (2a, 2b, 2c) arranged in three formats. Bristle tuft (2a) is adjacent wing (3a) and is angled towards said wing. Bristle tuft (2b) is adjacent wing (3b) and is angled towards said wing. Bristle tuft (2) extends orthogonal to the bristle-bearing surface.

[0040] FIG. 9 discloses a brush head comprising a pair of massaging wings, which are connected to one another along the underside of the brush head. This allows the wings to be manufactured in a single injection moulding step. It also provides improved stability of the wings during use when they are bent away from the brush head.

[0041] FIG. 10 discloses how the brush according to the invention has a massaging effect during use. The wings (3) are splayed outwardly such that they are in contact with the gums (9) while the bristles contact the teeth. Accordingly, the wing moves along the gum surface during use and this

improves the oxygenation of the gum tissue, which helps to provide stronger healthy gums.

[0042] FIG. 11 discloses a brush head comprising a wing (3) which has a curved tip edge (10) to improve the massaging effect on the gums by presenting an uneven contact during use.

1. Toothbrush comprising a head and a handle, the head comprising massaging wings extending from a bristle-bearing face said massaging wings flanking a central bristle area and angled outwardly from said area, characterised the bristles are arranged in bristle tufts and of the bristle tufts which are adjacent a wing, at least a portion are angled towards said wing.

2. Toothbrush according to claim 1, wherein the wings sit over an edge of the head of the brush.

3. Toothbrush according to claim 1, wherein each individual wing is connected to the head by way of a tab which extends along an underside surface of the head opposite the bristle-bearing face.

4. Toothbrush according to claim 1, wherein the wings are made from an elastomeric material.

5. Toothbrush according to claim 1, wherein at least one of the wings comprises a surface formation.

6. Toothbrush according to claim 1, wherein the wings have a tip profile which closely matches a tip profile of the bristles.

7. Toothbrush according to any preceding claim, wherein the wings are integral with one another.

8. Toothbrush according to claim 7, wherein the wings are connected to each other by way of an elastomeric channel which extends from one wing, around a tip portion of the brush head and to the other wing.

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