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(54) **TOOTHBRUSHES**
ZAHNBÜRSTEN
BROSSES A DENTS

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Description

[0001] The present invention relates to novel handles and to novel bristle configurations for toothbrushes and to novel combinations thereof.

[0002] The handle configurations have as their primary (but not sole) objective the provision of a toothbrush which is easier for the user to manipulate.

[0003] The bristle configurations have as their primary (but not sole) objective the provision of a toothbrush in which the bristles afford improved cleaning action and access to the teeth and gums.

[0004] USP5369835 discloses a toothbrush having a handle comprising a waist, shoulder and end section, but the relationships there between are entirely different to those in the present invention.

[0005] USP5398369 discloses a toothbrush having a handle with an end position, a slightly narrower waist portion and a shoulder portion of approximately the same lateral width as the end portion, the relationships there between are very different to those of the present invention.

[0006] USP5305489 discloses a toothbrush having a bristle configuration having a mixture of concave and convex bristle profiles but these form a continuous curve rather than a discontinuous curve as in the present invention and does not disclose the combination of features to which the present invention is directed.

[0007] Also according to the present invention a toothbrush having a handle is provided as claimed in claim 1.

[0008] The handle is preferably curvilinear in plan view and in elevation. The ratio of the maximum width of the end portion in plan view to the minimum width of the waist in plan view is preferably in the range 1.1:1 to 1.8:1. The ratio of the maximum width of the shoulder in plan view to the minimum width of the waist in plan view is preferably in the range 1.05:1 to 1.5:1. The end portion is preferably thicker in side elevation than the waist. The ratio of the maximum thickness of the end portion in side elevation to the minimum thickness of the waist in side elevation is preferably in the range 1.2:1 to 2.0:1. The end portion is preferably thicker in side elevation than is the shoulder. The shoulder is preferably thicker in side elevation than the waist. The ratio of the maximum thickness of the shoulder viewed in side elevation to the minimum thickness of the waist: viewed in side elevation is preferably in the range 1.01:1 to 1.5:1.

[0009] The ratio of the length from the free end of the end portion to the location of the minimum width of the waist: viewed in side elevation to the maximum width of the end portion viewed in side elevation is preferably in the range 4:1 to 7:1 e.g. about 5:1 to 6:1, especially about 5.6:1.

[0010] The handle may have a grip enhancing unitary mat providing grip enhancing surfaces on at least two separate locations of the handle.

[0011] The mat preferably provides the grip enhancing surfaces on at least the front and back of the handle

or at at least two locations on the front or the back of the handle or at least one location at the front or back of the handle and at at least one side of the handle. Preferably the mat provides grip enhancing surfaces at three or four separate locations on the handle. The grip enhancing surfaces of the mat may also afford grip enhancing configurations, for example ribs, preferably inclined diagonally to the handle.

[0012] The handle preferably has grip enhancing configurations on at least two separate locations of the handle.

[0013] The grip enhancing configurations preferably are provided on at least the front and back of the handle or at at least two locations on the front or the back of the handle or at least one location at the front or back of the handle and at at least one side of the handle. The grip enhancing configurations are preferably provided at three or four separate locations on the handle.

[0014] The invention has a number of aspects and may be put into practice in various ways and a number of specific embodiments will be described to illustrate the inventive aspects with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a first embodiment of a toothbrush embodying aspects of the present invention in respect of the handle and of the bristle configuration,

Figure 2 is a plan view of the embodiment of Figure 1 from the bristle side,

Figure 3 is a plan view of the embodiment of Figure 1 from the other side,

Figures 4 and 5 are side elevations from either side of the embodiment of Figure 1,

Figure 6 is an enlarged plan view of the tuft configuration of the bristles of the embodiment of Figure 1, Figure 7 is an enlarged side elevation of the bristle head of Figures 4 and 5,

Figure 8 is an end elevation of the bristle head from the handle end of the embodiment of Figure 1,

Figure 9 is an end elevation from the head end of the bristle head of the embodiment of Figure 1.

[0015] Figure 1 shows a toothbrush having a handle 35 and a bristle head 50.

[0016] The handle is shown in Figures 1 to 5, the head in Figures 1 to 9 but in enlarged scale in Figures 6 to 9.

[0017] The handle (which is a first embodiment thereof) has a body portion having a palm engaging end portion 36 with a rounded free end 47, a waist 37, a finger engagable shoulder 38, a neck 39 and a head 40 for receiving the bristles of the bristle configuration 50, in a surface 46. A mat 41 of rubber like material (for example the rubber like material may be that sold under the Trade Mark SANTOPRENE) (to give a good wet grip for the user's fingers) is attached to the handle so as to wrap around the waist and provide a grip surface 42 on the shoulder 38 on the bristle face of the handle as well as

a grip surface 43 on the back face of the shoulder of the handle and a grip surface 44 on the back face of the palm engaging end portion 36 of the handle.

[0018] Each of the surfaces 42, 43 and 44 have ribs 45 moulded into their surfaces in such a way as to lie diagonally across the said surfaces when located on the handle. This wrapped unitary mat arrangement facilitates placement of the gripping surfaces on the handle.

[0019] The ratio of the maximum transverse width in plan view of the portion 36 (indicated by the line 36) to the minimum transverse width in plan view of the waist 37 (indicated by the line 37) is 1.4:0.9 i.e. 1.55:1 or more broadly 1.1:1 to 1.8:1 e.g. 1.2:1 to 1.7:1 more preferably 1.3:1 to 1.6:1. The ratio of the widest transverse width in plan view of the shoulder 38 (indicated by the line 38) to the minimum transverse width in plan view of the waist 37 is 1.1:0.9 i.e. 1.2:1 or more broadly 1.05:1 to 1.5:1 e.g. 1.1:1 to 1.3:1. The ratio of the widest transverse width in plan view of the end 36 to the shoulder 38 is 1.4:1.1 i.e. 1.25:1 or more broadly greater than 1:1 e.g. 1.2:1 to 1.5:1.

[0020] The end portion 36 is wider than the shoulder 38 which is wider than the waist 37.

[0021] The ratio of the maximum thickness in side elevation of the end portion 36 (see Figures 4 and 5) indicated by the line 80 in Figure 4 including the ribs 45 on the mat, namely 1.5 units to the minimum width of the waist 37 indicated by the line 81 namely 0.9 units is 1.7:1 or more broadly 1.3:1 to 2.0:1 or 1.5:1 to 1.9:1. The ratio of the maximum thickness in side elevation of the shoulder 38 indicated by the line 82 including the ribs 45 on the mat, namely 1.1 units to the minimum width of the waist 37 namely 0.9 units is 1.2:1 or more broadly 1.05:1 to 1.5:1 or 1.1:1 to 1.3:1.

[0022] The ratio of the maximum thickness in side elevation of the end portion 36 to the shoulder 38 is 1.35:1 or more broadly 1.1:1 to 1.7:1 or 1.2:1 to 1.6:1.

[0023] The ratio of the maximum thickness in side elevation of the end portion 36 to the shoulder 38 is 1.4:1 or more broadly 1.1:1 to 1.7:1 or 1.2:1 to 1.6:1.

[0024] In a third embodiment (not shown) the handle of the second embodiment is provided with ribs akin to those 45 on the mat 41, though not necessary in the same numbers or the same inclination or on all of the surfaces 42, 43 and 44. However an arrangement which has the same ribs 45 as in the first embodiment integrally moulded into the handle is preferred.

[0025] Turning now to the head 50 the embodiment of the bristle configuration is shown in Figures 1 to 9. As can be seen in Figure 7 the head has three groups of bristle tufts 55, 75 and 95. These are shown in plan view in Figure 6 delineated by the transverse lines 56 and 76. The group 55 affords a teeth engaging surface 57 which is convex with regard to the surface 46 of the head of the handle when the toothbrush is viewed in side elevation. The surface 46 is that in which the tufts of bristles are embedded.

[0026] The group 75 affords a teeth engaging surface

77 which is concave with regard to the surface 46 when the toothbrush is viewed in side elevation.

[0027] The group 75 has a central front outer tuft 60, side tufts 61,62,63 and 64,65,66 on either side and two centre line tufts 67 and 68. The group 75 has five transverse rows of tufts 78,79,80,81,82. The first three rows 78, 79 and 80 having four tufts each and the last two rows 81 and 82 five tufts each.

[0028] The teeth engaging ends of the tufts 78 are further from the surface 46 than the ends of the tufts 63, 68 and 66 but come to about the same level as the tufts 67, 62 and 65.

[0029] The group 95 affords a teeth engaging surface 97 which is closely similar in profile to the surface 57.

The group 95 has a first row of five tufts 98, a second row of four tufts 99 and two side tufts 100 and 101 and a central rear tuft 102. The tufts in row 98 are shorter than the tufts in row 82, but the tufts in row 99 are about the same height as those in row 82.

[0030] The teeth engaging surface afforded by the bristles as whole is thus wavy or sinusoidal but is not a continuous surface having breaks in level between the end tufts of adjacent groups, i.e. 63, 68, 66 of group 55 and row 78 of group 75 and row 82 of group 75 and row 98 of group 95.

[0031] Referring to Figure 6 the length of the bristle configuration in plan view or in side elevation, namely the length parallel to the surface 46 of the teeth engaging ends of the bristles in 8.8 units. 100% of this length is provided by bristles the teeth engaging ends of which lie in a curved line when the toothbrush is viewed in side elevation. The group 55 occupies 2.5 units, and the group 95 also occupies 2.5 units and both are convex. The group 75 occupies 3.5 units and is concave. The ratio of convex to concave is thus 5:3.5 or 1.4:1 or more broadly 1:1 to 2:1.

[0032] it will be noted that in the specific bristle configuration shown in the drawings the ends of the bristles at any particular transverse location, i.e. along the line perpendicular to the longitudinal axis of the head, all lie at the same distance from the surface 46, i.e. in a straight line transverse to the head and parallel to the surface 46.

Claims

1. A toothbrush having a handle and a bristle configuration (50) of which the teeth engaging ends (57,77,97) of the bristle do not lie in a plane parallel to the surface (46) of the head of the handle in which the bristles are embedded when the toothbrush is viewed in side elevation, the teeth engaging ends of the bristles lying adjacent to each other lying in a curved line when the toothbrush is in side elevation, the curved line being provided by a mixture of at least one concave group (75) of bristles and at least one convex group (55,95) of bristles, **charac-**

terised in that the ratio of the length of the curved line provided by convex bristles to that provided by the concave bristles is in the range 1:1 to 2:1, and **in that** the curved line is discontinuous there being a convex group of bristles (55), the teeth engaging ends of which lie in a convex line (57) when the toothbrush is viewed in side elevation, located at the toe of the head of the brush, and a convex group of bristles (95), the teeth engaging ends (97) of which lie in a convex line when the toothbrush is viewed in side elevation, located at the heel of the head of the brush and a concave group of bristles (75), the teeth engaging ends (77) of which lie in a concave line when the toothbrush is viewed in side elevation, located between the two convex groups of bristles, the tufts (78,82) at each end of a concave group (75) extending further from the surface (46) of the head of the brush in which the bristles are embedded than do the adjacent tufts of bristles (63,68,66 or 98) in the adjacent concave group, the said tufts (78) at one end of a concave group (75) extending to about the same level as the longest tufts (62,67,65) in the adjacent convex group (55), and the said tufts (82) at the other end of a concave group (75) extending to about the same level as the longest tufts (99) in the adjacent convex group (95), and **in that** the teeth engaging ends of the bristles in a transverse direction across the head of the toothbrush extend substantially the same length from the surface (46) of the head of the brush in which the bristles are embedded,

the handle having an end portion (36), a waist (37), a shoulder portion (38) and a neck (39) connecting the shoulder to the head, the waist (37) being narrower at least in plan view than the end portion (36) or the shoulder (38), and the end portion (36) being rounded, wherein the ratio of the maximum width of the end portion (36) in plan view to the maximum width (38) of the shoulder (38) in plan view is in the range 1.2:1 to 1.5:1, the end portion (36) being thicker in side elevation than is the shoulder (38), and the ratio of the maximum thickness of the end portion (36) in side elevation to the maximum thickness of the shoulder (38) in side elevation is in the range 1.1:1 to 1.7:1.

2. A toothbrush as claimed in claim 1 **characterised in that** the ratio of the maximum width (38) of the shoulder (38) in plan view to the minimum width (37) of the waist (37) in the plan view is in the range 1.05:1 to 1.5:1.
3. A toothbrush as claimed in claim 1 or claim 2 **characterised in that** the ratio of the maximum thickness (38) of the shoulder (38) viewed in side elevation to the minimum thickness (37) of the waist (37) viewed in side elevation is in the range 1.01:1 to 1.5:1.

4. A toothbrush as claimed in any one of claims 1 to 3 **characterised in that** the ratio of the length from the free end (47) of the end portion (36) to the location of the minimum width of the waist (37) viewed in side elevation to the maximum width (36) of the end portion (36) viewed in side elevation is in the range 4:1 to 7:1.

10 Patentansprüche

1. Zahnbürste mit einem Griff und einer Borstenanordnung (50), bei der die Zahneingriffsenden (57, 77, 97) der Borsten, wenn die Zahnbürste in der Seitenansicht betrachtet wird, nicht in einer Ebene parallel zur Oberfläche (46) des Kopfes des Griffs liegen, in den die Borsten eingebettet sind, wobei die benachbart zueinander liegenden Zahneingriffsenden der Borsten auf einer gekrümmten Linie liegen, wenn die Zahnbürste in der Seitenansicht betrachtet wird, wobei die gekrümmte Linie durch eine Mischung von zumindest einer konkaven Gruppe (75) von Borsten und zumindest einer konvexen Gruppe (55, 95) von Borsten gebildet ist, **dadurch gekennzeichnet, dass** das Verhältnis der Länge der gekrümmten Linie der konvexen Borsten zu derjenigen der konkaven Borsten im Bereich von 1:1 bis 2:1 liegt und dass die gekrümmte Linie un stetig ist, wobei eine konvexe Gruppe von Borsten (55), deren Zahneingriffsenden bei Betrachtung der Zahnbürste in der Seitenansicht auf einer konvexen Linie (57) liegen, im vorderen Bereich des Kopfs der Bürste angeordnet ist und eine konvexe Gruppe von Borsten (95), deren Zahneingriffsenden (97) bei Betrachtung der Zahnbürste in der Seitenansicht auf einer konvexen Linie (57) liegen, im hinteren Bereich des Kopfs der Bürste angeordnet ist, und eine konkave Gruppe von Borsten (75), deren Zahneingriffsenden (77) bei Betrachtung der Zahnbürste in der Seitenansicht auf einer konkaven Linie liegen, zwischen den zwei konvexen Gruppen von Borsten angeordnet ist, wobei sich die Büschel (78, 82) an jedem Ende einer konkaven Gruppe (75) weiter von der Oberfläche (46) des Kopfes der Bürste erstrecken, in die die Borsten eingelagert sind, als die benachbarten Büschel von Borsten (63, 68, 66 oder 98) in der benachbarten konkaven Gruppe, die Büschel (78) an einem Ende einer konkaven Gruppe (75) sich bis zu in etwa der gleichen Höhe erstrecken wie die längsten Büschel (62, 67, 65) in der benachbarten konvexen Gruppe (55), und dass sich die Zahneingriffsenden der Borsten in Richtung quer über den Kopf der Zahnbürste im Wesentlichen im gleichen Abstand von der Oberfläche (46) des Kopfes der Bürste erstrecken, in die die Borsten eingebettet sind, wobei der Griff einen Endbereich (36), eine Taille (37), einen Schulterbereich (38) und einen Hals

(39) aufweist, der die Schulter mit dem Kopf verbindet, wobei die Taille (37) zumindest in Draufsicht schmaler ist als der Endbereich (36) oder die Schulter (38), und wobei der Endbereich (36) gerundet ist, wobei das Verhältnis von maximaler Breite des Endbereichs (36) in der Draufsicht zur maximalen Breite der Schulter (38) in der Draufsicht im Bereich von 1,2:1 zu 1,5:1 liegt, der Endbereich (36) in Seitenansicht dicker ist als die Schulter (38) und das Verhältnis von maximaler Dicke des Endbereichs (36) in Seitenansicht zur maximalen Dicke der Schulter (38) in Seitenansicht im Bereich von 1,1:1 bis 1,7:1 liegt.

2. Zahnbürste nach Anspruch 1, **dadurch gekennzeichnet, dass** das Verhältnis von maximaler Breite der Schulter (38) in Draufsicht zur minimalen Breite der Taille (37) in Draufsicht im Bereich von 1,05:1 bis 1,5:1 liegt.
3. Zahnbürste nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Verhältnis von maximaler Dicke der Schulter (38) betrachtet in Seitenansicht zur minimalen Dicke der Taille (37) betrachtet in Seitenansicht im Bereich von 1,01:1 bis 1,5:1 liegt.
4. Zahnbürste nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** das Verhältnis der Länge vom freien Ende (47) des Endbereichs (36) bis zur Lage der minimalen Breite der Taille (37) betrachtet in Seitenansicht zur maximalen Breite des Endbereichs (36) betrachtet in Seitenansicht im Bereich von 4:1 bis 7:1 liegt.

Revendications

1. Brosse à dents ayant un manche et une configuration de poils (50) dont les extrémités de contact avec les dents (57, 77, 97) des poils ne se situent pas dans un plan parallèle à la surface (46) de la tête du manche dans laquelle les poils sont logés lorsque la brosse à dents est vue en vue latérale, les extrémités de contact avec les dents des poils se trouvant adjacents les uns aux autres dans une ligne courbe lorsque la brosse à dents est en élévation latérale, la ligne courbe étant prévue avec un mélange d'au moins un groupe concave (75) de poils et au moins un groupe convexe (55, 95) de poils, **caractérisée en ce que** le rapport de la longueur de la ligne courbe prévue avec les poils convexes par rapport à celle prévue avec les poils concaves est dans la plage allant de 1 : 1 à 2 : 1, **et en ce que** la ligne courbe est discontinue, un groupe de poils convexe (55), dont les extrémités de contact avec les dents sont situées dans une ligne convexe (57) lorsque la brosse à dents est vue en élévation latérale, est situé au bout de la tête de

la brosse, et un groupe de poils convexe (95), dont les extrémités de contact avec les dents (97) sont situées dans une ligne convexe lorsque la brosse à dents est vue en élévation latérale, situé au talon de la tête de la brosse et un groupe de poils concave (75), dont les extrémités de contact avec les dents (77) sont situées dans une ligne concave lorsque la brosse à dents est vue en élévation latérale, situé entre les deux groupes convexes de poils,

les touffes (78, 82) à chaque extrémité d'un groupe concave (75) s'étendant plus loin de la surface (46) de la tête de la brosse dans laquelle les poils sont logés que les touffes adjacentes de poils (63, 68, 66 ou 98) dans le groupe concave adjacent, lesdites touffes (78) à une extrémité du groupe concave (75) s'étendant jusqu'à environ le même niveau que les touffes les plus longues (62, 67, 65) dans le groupe convexe adjacent (55), et lesdites touffes (82) à l'autre extrémité d'un groupe concave (75) s'étendant jusqu'à environ le même niveau que les touffes les plus longues (99) dans le groupe convexe adjacent (95),

et en ce que les extrémités de contact avec les dents des poils dans la direction transversale en travers de la tête de la brosse à dents (par exemple la rangée 78) s'étendent sensiblement sur la même longueur depuis la surface (46) de la tête de la brosse dans laquelle les poils sont logés,

le manche de brosse à dents ayant une partie de tête (40) portant ou adaptée pour porter une configuration de poils (50), le manche ayant une partie d'extrémité (36), une taille (37), une partie d'épaule (38) et un cou (39) reliant l'épaule à la tête, la taille (37) étant plus étroite au moins en vue en plan que la partie d'extrémité (36) ou l'épaule (38), et la partie d'extrémité (36) étant arrondie, **en ce que** le rapport de la largeur maximale de la partie d'extrémité (36) en vue en plan par rapport à la largeur maximale de l'épaule (38) en vue en plan est dans la plage allant de 1,2 : 1 à 1,5 : 1, la partie d'extrémité étant plus épaisse en élévation latérale que l'épaule ne l'est, et le rapport de l'épaisseur maximale de la partie d'extrémité (36) en élévation latérale à l'épaisseur maximale de l'épaule (38) en élévation latérale est dans la plage allant de 1,1 : 1 à 1,7 : 1.

2. Brosse à dents selon la revendication 1, **caractérisé en ce que** le rapport de la largeur maximale (38) de l'épaule (38) en vue en plan à la largeur minimale (37) de la taille (37) en vue en plan est dans la plage allant de 1,05 : 1 à 1,5 : 1.
3. Brosse à dents selon la revendication 1 ou 2, **caractérisé en ce que** le rapport de l'épaisseur maximale (38) de l'épaule (38) vue en élévation latérale à l'épaisseur minimale (37) de la taille (37) vue en élévation latérale est dans la plage allant de 1,01 : 1 à 1,05 : 1.

4. Brosse à dents selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** le rapport de la longueur de l'extrémité libre (47) de la partie d'extrémité (36) à l'emplacement de largeur minimale de la taille (37) vue en élévation latérale à la largeur maximale de la partie d'extrémité (36) vue en élévation latérale est dans la plage allant de 4 : 1 à 7 : 1.

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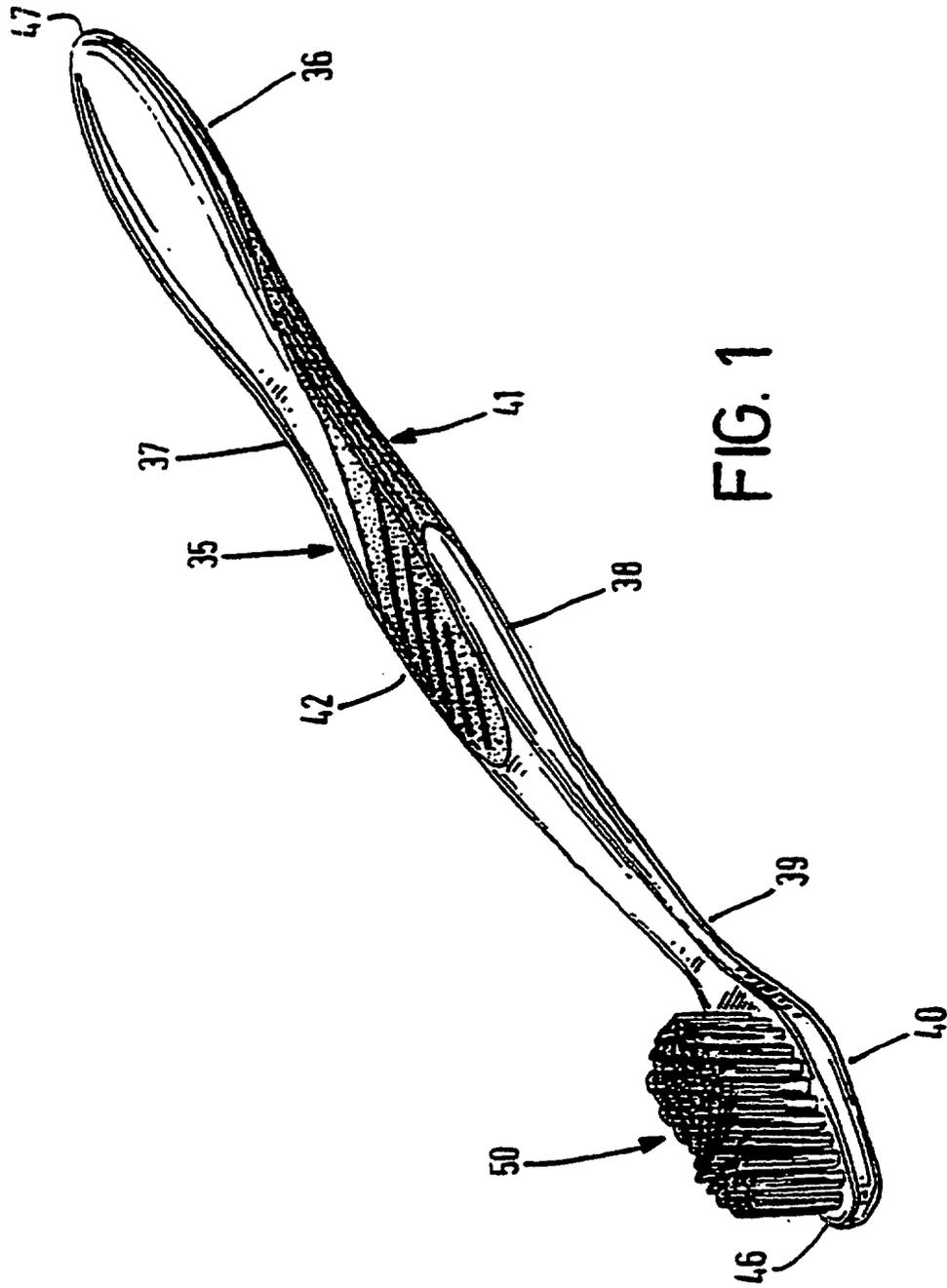


FIG. 1

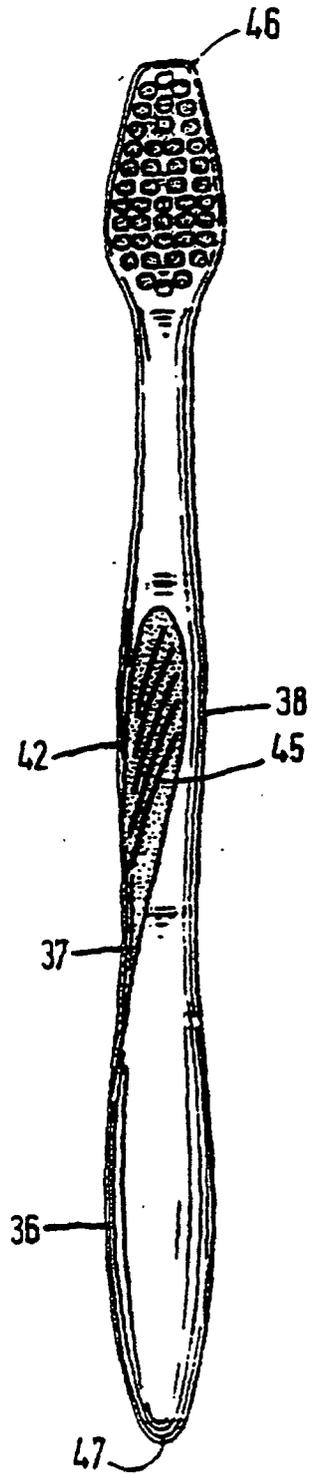


FIG. 2

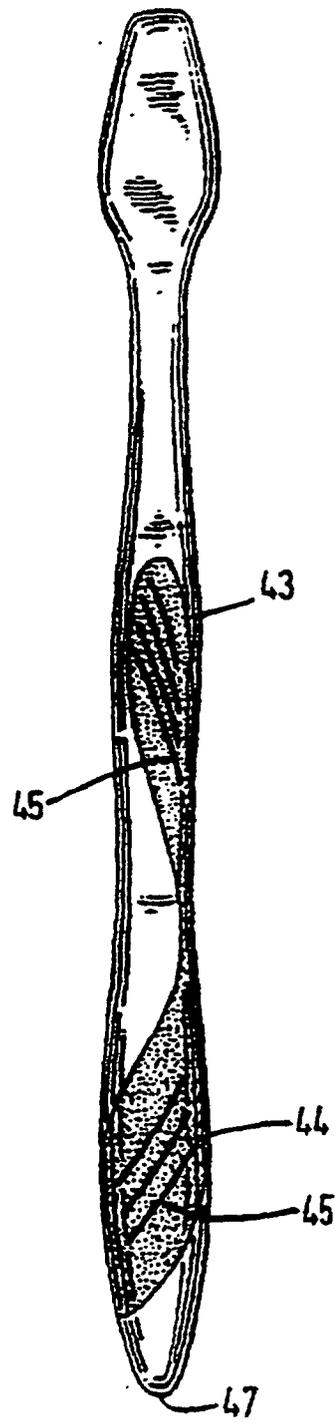


FIG. 3

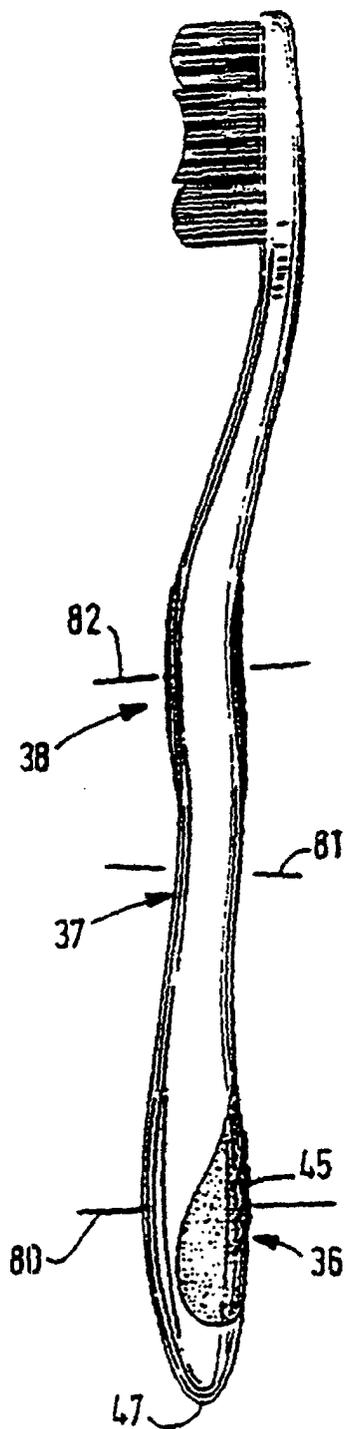


FIG. 4

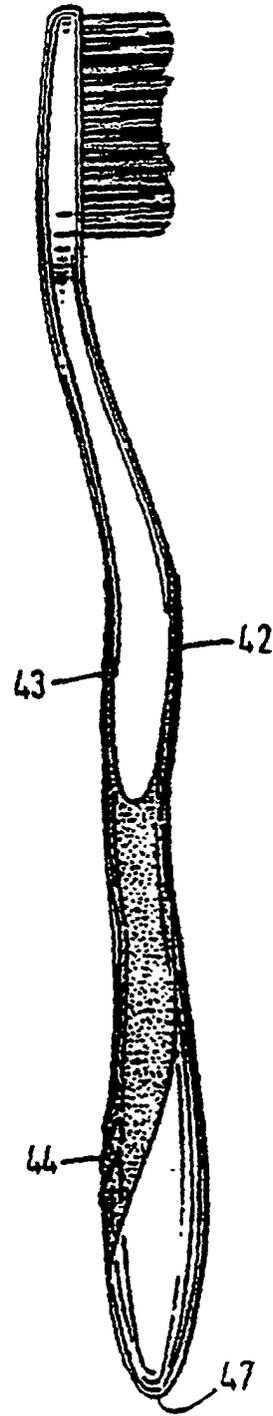


FIG. 5

