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(54) **TOOTHBRUSH**

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(57) **ABSTRACT**

Toothbrush comprising a handle (1) and a head (2), the handle (1) made out of a plastics material and having a general handle surface (3) and a grip portion (4), characterized in that the grip portion (4) comprises a projection (5) made out of said plastics material and which projects from the handle surface (3), said projection (5) having a gripping surface (6) which is raised from the handle surface (3) and has an elastomeric edge (7).

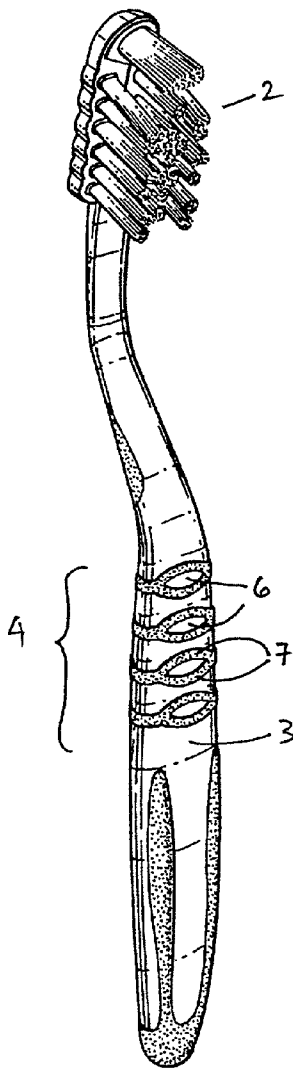


Fig. 1

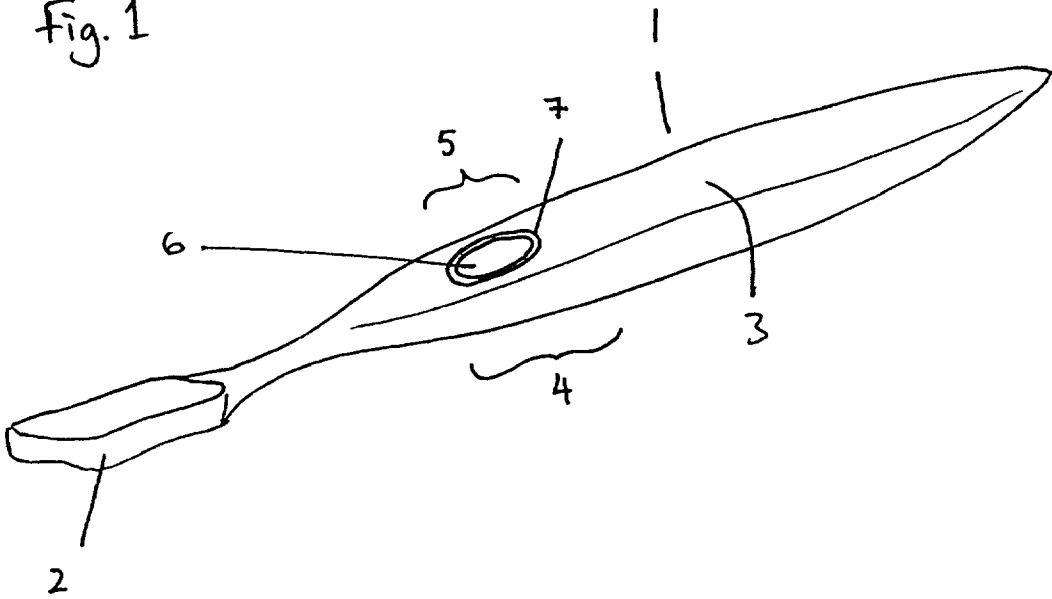


Fig. 2

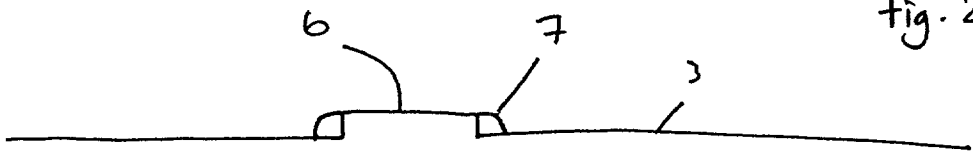


Fig. 3

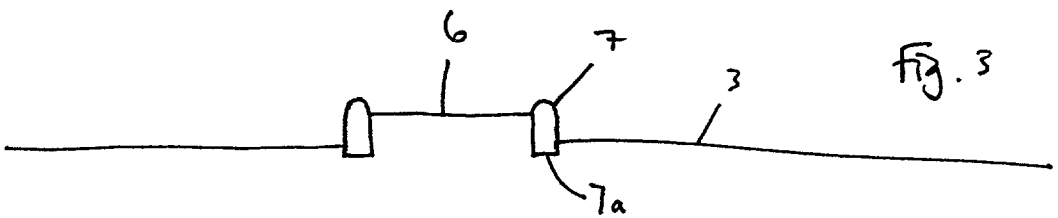
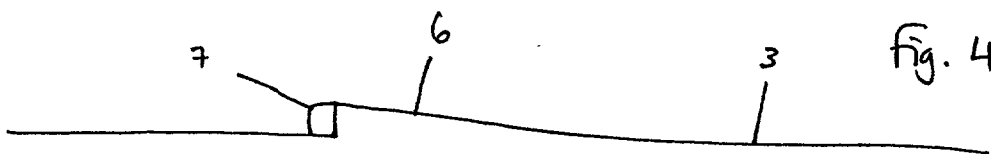


Fig. 4



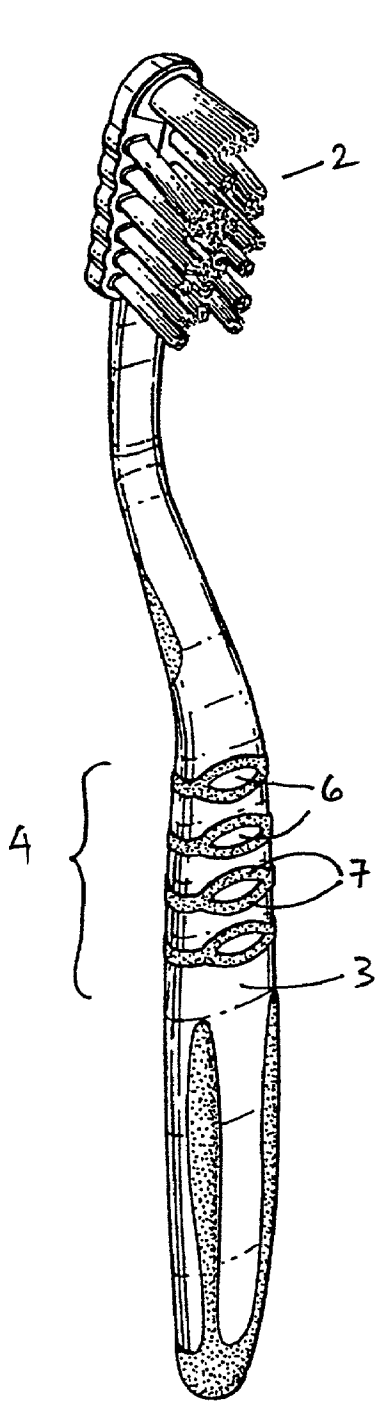


Fig. 5

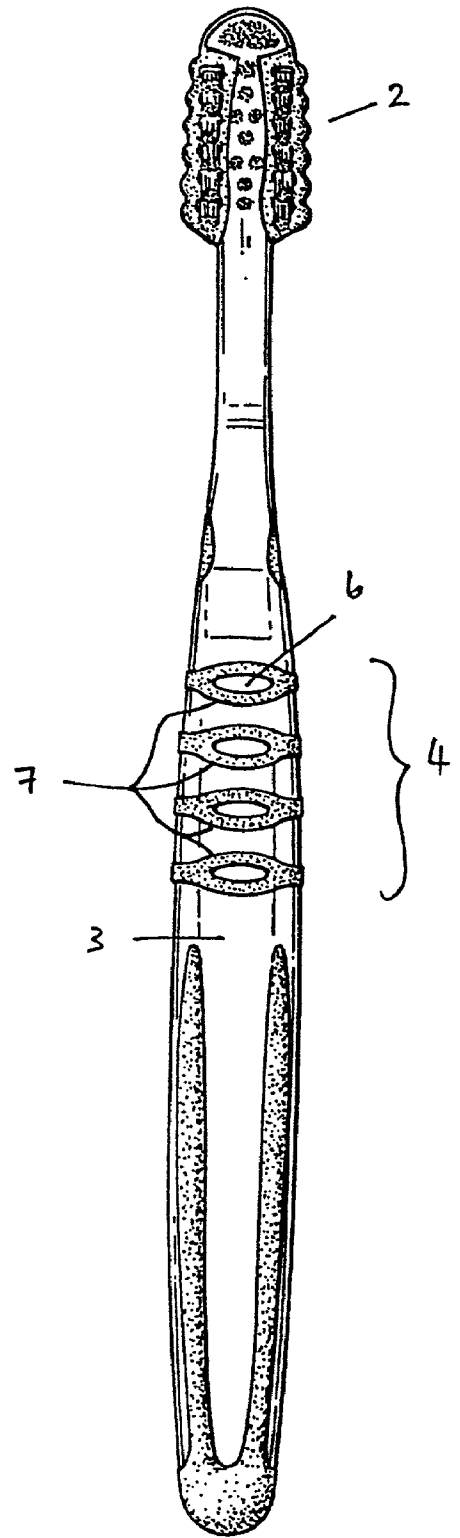


Fig. 6

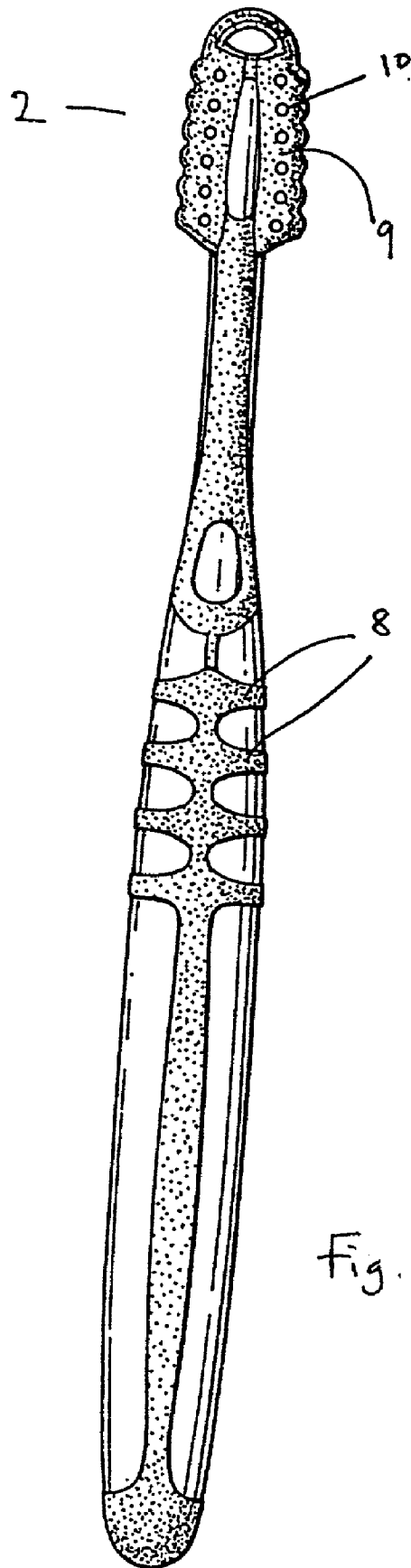


Fig. 7

TOOTHBRUSH

[0001] The present invention relates to a toothbrush with an improved handle portion.

[0002] Nearly every toothbrush in the prior art has a handle portion and a bristle-bearing head. The handle portion is often ergonomically designed to facilitate the grip made by the hand during use. Usually this is in the form of a projection thus providing extra purchase to the grip.

[0003] Over the past several years a number of new toothbrushes have been introduced into the market. For instance, the Colgate-Palmolive Company now sells a product known as the Precision brush. Besides a special brush head, the Precision product in one version includes a rippled handle whose upper and lower surfaces are covered with a material different from that of the lateral and front portions of the handle. Only small differences in hardness distinguish the upper/lower surface material (86 Shore Hardness) from the lateral/front material (95-100 Shore Hardness). U.S. Pat. Des. 342,160 (Curtis et al.) and U.S. Pat. Des. 342,162 (Curtis et al.) cover the design aspects of the Colgate-Palmolive product.

[0004] A similar design concept has been incorporated into the Crest Complete brush, a product of the Procter & Gamble Company. FIG. 1 of WO 91/19437 (Volpenhein et al.) illustrates the Crest Complete brush. A substantial portion of both the upper and lower surfaces of the handle are covered by strips of a material (89 Shore Hardness) leaving the lateral sides (95-100 Shore Hardness) uncovered.

[0005] Dual material handles have also been introduced by the SmithKline Beecham Corporation under the Aqua Fresh trademark. Similar to its competitors, a very substantial part of the upper and lower surfaces of the handle are covered by a material (88 Shore Hardness) different from the remaining material (95-100 Shore Hardness) of the handle. A related brush is illustrated in U.S. Pat. Des. 328,977 (Halm).

[0006] U.S. Pat. Des. 334,288 (Witzig-Jaggi) describes a dual material toothbrush wherein material on an upper surface of the handle exhibits a sloping change of thickness.

[0007] Utilization of dual materials has been mainly for aesthetic purposes, and only secondarily meant to improve grippability of the handle.

[0008] Another recent development in toothbrush technology has been the use of corrugated handles. WO 93/15627 (Halm) describes a handle with an integral corrugated core surrounded by an elastomeric region. The corrugated core provides resiliency to the handle. This corrugation has also been utilized in DE 4,222,931 (Henkel). Therein is reported a ribbed handle with each of the ribs being of square cross section.

[0009] There have been many innovations in this area as can be seen through the above briefly described patents. Nevertheless, there remains room for improved models.

[0010] Accordingly, it is an object of the present invention to provide a toothbrush that can be manipulated with less fatigue than typical commercial toothbrushes.

[0011] It is still another object of the present invention to provide a toothbrush with a feature that reduces slip and that allows for improved grippability particularly when the brush is wet.

[0012] Accordingly, the present invention provides a toothbrush comprising a handle (1) and a head (2), the handle (1) made out of a plastics material and having a general handle surface (3) and a grip portion (4), characterized in that the grip portion (4) comprises a projection (5) made out of said plastics material and which projects from the handle surface (3), said projection (5) having a gripping surface (6) which is raised from the handle surface (3) and has an elastomeric edge (7).

[0013] The general handle surface is the surface of the handle which does not form part of the projection. The projection is meant to provide a gripping surface which is raised in relation to the general handle surface.

[0014] Optimally, the plastic utilized for the handle should have a Shore Hardness value ranging from about 95 to 100. Shore Hardness values for the elastomeric material preferably range from 5 to 75, optimally from 20 to 65. Typical plastics that can be utilized for the present invention are nylon, polyethylene, polycarbonate, polyethylene terephthalate, polyacrylate, polymethylmethacrylate and styrene/acrylonitrile (SAN). Most preferred is SAN.

[0015] Typical materials for the elastomeric edge are rubber and polyurethane, the former being selected from the group consisting of polyisobutylene, polypropylene and polybutadiene. Most preferred is Santoprene, a grade of polypropylene rubber available from the Monsanto Company, and Buna N rubber.

[0016] By providing an elastomeric edge to a projection from the handle a user will experience an improved grip and hence less strain in manipulating the toothbrush. Preferably the elastomeric material extends from a handle surface so as to be at least level with a top surface of the projection to provide the best grip but an improved grip can nevertheless be obtained by having an elastomeric section which stands proud of the projection. Preferably, however, this is not the case and the elastomer provides a flush surface with the raised grip surface of the projection.

[0017] The projection may be partially or wholly surrounded by the elastomeric material. By partially is meant that the projection has at least along one of its sides an elastomeric material which can improve the grip of the grip portion. Preferably, the projection is sized such that a whole projection may be covered by the hand during use. For example, the user usually grips the top surface of the handle with the thumb during use. As such, it would be preferable for a projection on the top surface of the handle to be sized such that it may be completely covered under a thumb. Preferably, the projection is surrounded on all sides by an elastomeric material such that the elastomeric edge is the perimeter of the gripping surface of the projection.

[0018] The grip portion of the brush is preferably located on a top surface of the handle of the brush. However, it is also possible for the brush to have a grip portion on a bottom surface of the handle. Of course, a brush may have a grip portion according to the invention on both a bottom and a top surface of the handle.

[0019] It is also feasible for there to be provided an array of projections which may be spaced in any fashion, e.g. longitudinally, circumferentially or randomly over the grip portion of the handle. Where this is the case, the array shall be sized so as to present a grip portion ideally suited on a toothbrush.

[0020] To provide an improved bonding between the elastomer edge and the plastics material of the handle and the projection the elastomer may actually sit in a groove formed in the surface of the handle around the projection. This increases the surface area between the elastomer and the plastics material thus improving bonding during moulding.

[0021] Another feature that may be included with the toothbrush is that of a circumferential anti-slip structure on the handle. This structure will circumscribe the surfaces of the handle. Mechanically this semi-ring shape has the advantage, in combination with the projections on the grip portion, that a user's grip along the grip portion will have elastomer surfaces not only on an opposing side but also laterally along edges of the handle. It has been estimated that a significant percentage of the population at some point in their brushing technique grip sides of the toothbrush. Elastomer in the form of a ring provides the user a target area for holding but does not force gripping at any predisposed angular orientation. This allows for holding the toothbrush in a user's most natural or habitual manner.

[0022] Manufacture of the toothbrush handle involves formation first of the plastics material of the handle, perhaps with appropriate hollow areas for receipt of the elastomer material. Thereafter, the arm is placed into a mold and liquefied elastomer is injected thereinto filling out spaces within the arm and cavity of the mold. The grip portion and the semi-ring shape anti-roll structures may thereby be formed unitarily perhaps along with any other area of the brush which utilises an elastomeric material. For example, the brush head may comprise segments which are flexibly linked to one another by an elastomeric link. Such a link may be integral with the elastomer in the grip portion and they will be manufactured in a single injection moulding step.

[0023] Embodiments according to the invention will now be described in detail with reference to the following figures.

[0024] FIG. 1 is a perspective view of part of a toothbrush embodiment according to the invention.

[0025] FIG. 2 is a cross section of a grip portion of a toothbrush embodiment according to the invention.

[0026] FIG. 3 is another cross section of a grip portion of a toothbrush embodiment according to the invention.

[0027] FIG. 4 is yet another cross section of a grip portion of a toothbrush embodiment according to the invention.

[0028] FIGS. 5, 6 and 7 are of a particularly preferred embodiment according to the invention.

[0029] In detail, FIG. 1 shows an embodiment according to the invention. There is disclosed a toothbrush comprising a handle (1) and a head (2), the handle comprising a grip portion (4) with a projection (5) which has a gripping surface (6) and an elastomeric edge (7).

[0030] In this particular embodiment there are three raised sections each surrounded by elastomeric material. There may be any number of raised sections to provide an improved grip for the user. Also, in this embodiment the elastomeric material is not shown to connect each of the raised sections. Since the elastomeric material is usually injection moulded it is preferred that any elastomeric section is connected via a channel to any others present on the brush so that a single injection moulding point may be employed

to provide for all the elastomeric regions of the brush in one go. This is particularly relevant where there is another elastomeric region in the brush which is remote from the grip portion. For example, the brush may have an articulated head section which is flexible due to the presence of an elastomeric material suitably directed for providing flexibility.

[0031] FIG. 2 shows a cross-section of a grip portion of a toothbrush according to the embodiment of FIG. 1. Disclosed is a general handle surface (3), a projection and a gripping surface (6) on said projection, and an elastomeric edge (7). In this embodiment the elastomeric edge is flush with the gripping surface of the projection.

[0032] In FIG. 3 is disclosed another cross-section of a brush according to an embodiment of the invention. In this brush the grip portion comprises an elastomeric edge (7) which stands proud of the gripping surface (6).

[0033] This figure also discloses a groove around the edge of the projection which provides an increased surface area between the elastomer and the plastics material of the handle to facilitate binding of the one to the other during moulding. In FIG. 4 is disclosed a projection in the form of a ramp and only has an elastomeric edge at one side.

[0034] FIG. 5 discloses a toothbrush according to an embodiment of the invention. The brush comprises a grip portion (4) in the form of an array of longitudinally spaced projections (6) each with an elastomeric edge (7).

[0035] FIG. 6 discloses a plan view of the brush according to FIG. 5.

[0036] FIG. 7 discloses a view of a bottom side of the brush according to FIGS. 5 and 6. Shown are circumferential anti-slip rings (8) which extend from the elastomeric edges of the projections. This embodiment also shows a brush head which is flexible by way of elastomeric material links (9) between fixed bristle bearing sections of the head (10). The elastomer in this brush could be made in one injection moulding step thanks to a continuous link of elastomer between the grip portion and the head.

1. Toothbrush comprising a handle (1) and a head (2), the handle (1) made out of a plastics material and having a general handle surface (3) and a grip portion (4), characterised in that the grip portion (4) comprises a projection (5) made out of said plastics material and which projects from the handle surface (3), said projection (5) having a gripping surface (6) which is raised from the handle surface (3) and has an elastomeric edge (7).

2. Toothbrush according to claim 1, characterised in that the elastomeric edge (7) extends from the handle surface (3) such that it provides a flush surface with the gripping surface (6) of the projection (5).

3. Toothbrush according to claim 1, characterised in that the elastomeric edge (7) stands proud of the gripping surface (6) of the projection (5).

4. Toothbrush according to claim 1, characterised in that the grip portion (4) comprises an array of projections (5) on the handle surface (3).

5. Toothbrush according to claim 1, characterised in that the grip portion (4) comprises an array of longitudinally spaced projections (5).

6. Toothbrush according to claim 1, characterised in that the head (2) comprises flexibly linked segments linked by an

elastomeric material which is unitary with the elastomeric edge (7) in the grip portion (4).

7. Toothbrush according to claim 1, characterised in that the grip portion (4) is located on a top side of the handle (1).

8. Toothbrush according to any of claims 1-6, characterised in that the grip portion (4) is located on a bottom surface of the handle (1).

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