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(54) **TOOTHBRUSHES**

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(57) **ABSTRACT**

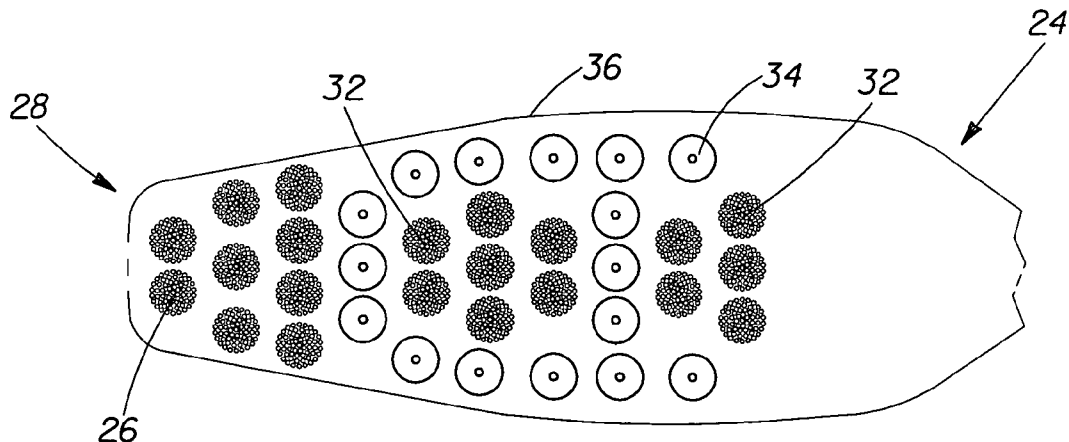
A toothbrush is provided. The toothbrush has a handle and a head attached to the handle. The head has a free end most distal from the handle and opposed side edges. A first group of bristle tufts are disposed adjacent the free end of the head. The first group of bristle tufts have bristles that include a slip agent. A second group of bristle tufts are disposed along the interior of the head. The second group of bristle tufts include textured bristles. A third group of bristle tufts are disposed adjacent the side edges of the head. The third group of bristle tufts include non-textured bristles.

(21) Appl. No.: **11/254,366**

(22) Filed: **Oct. 20, 2005**

**Related U.S. Application Data**

(60) Provisional application No. 60/620,611, filed on Oct. 20, 2004.



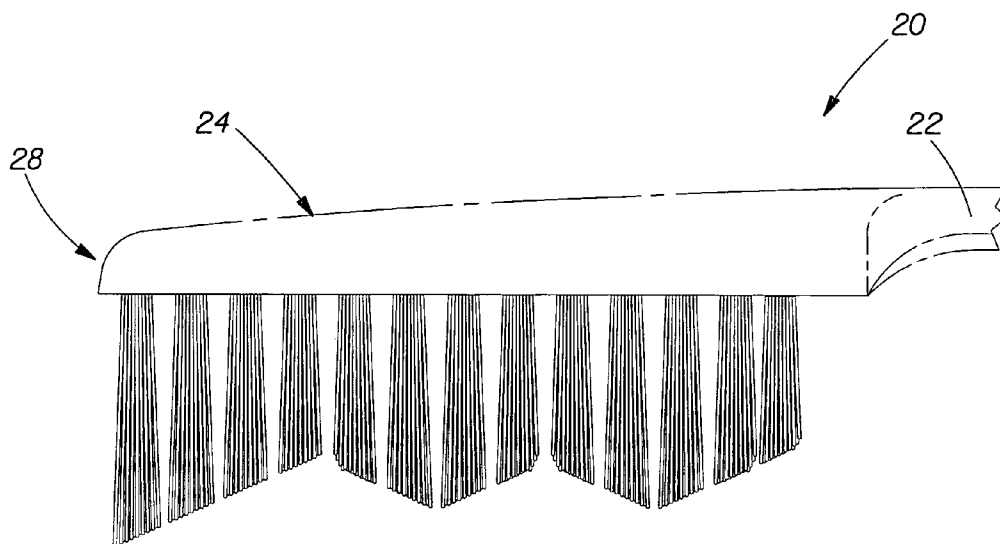


Fig. 1

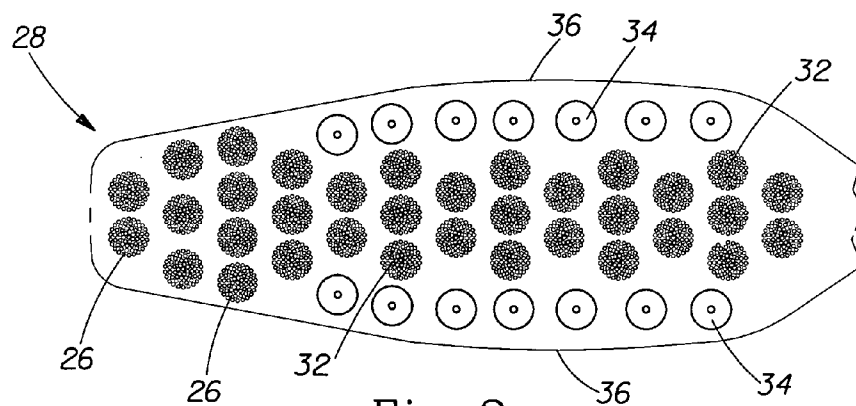


Fig. 2

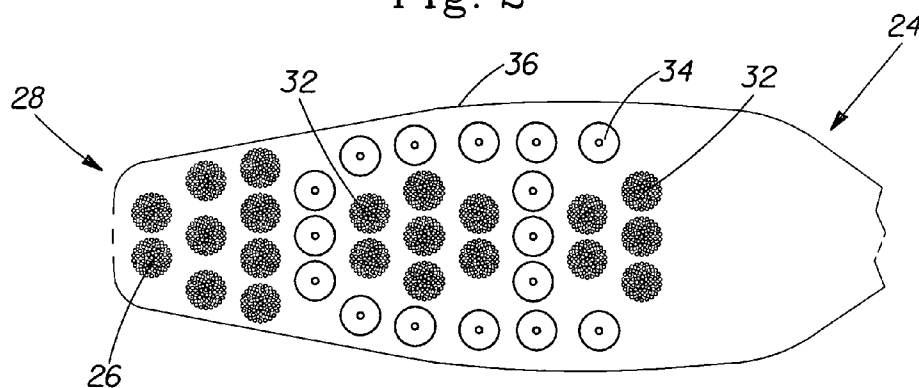


Fig. 3

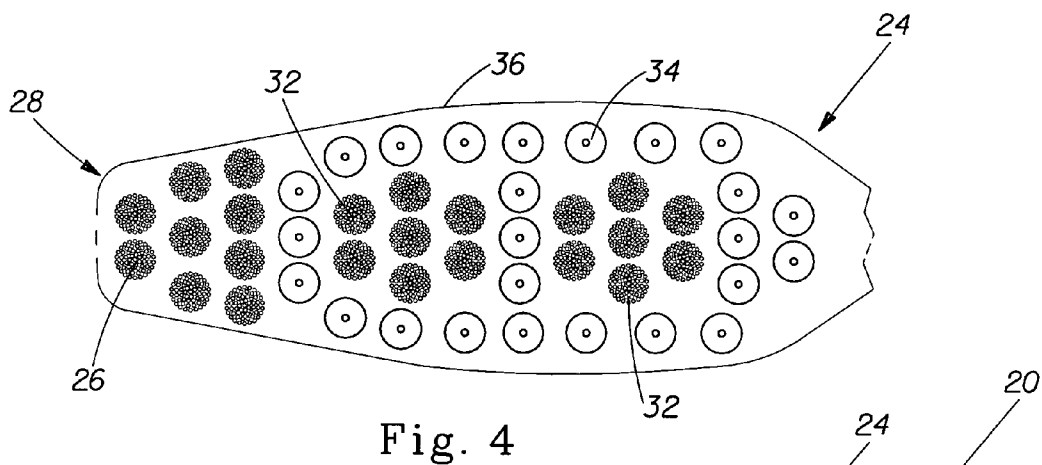


Fig. 4

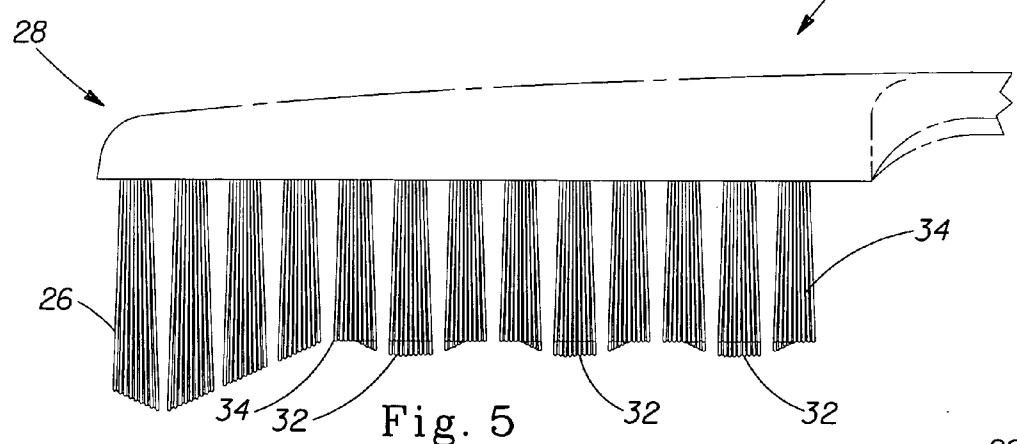


Fig. 5

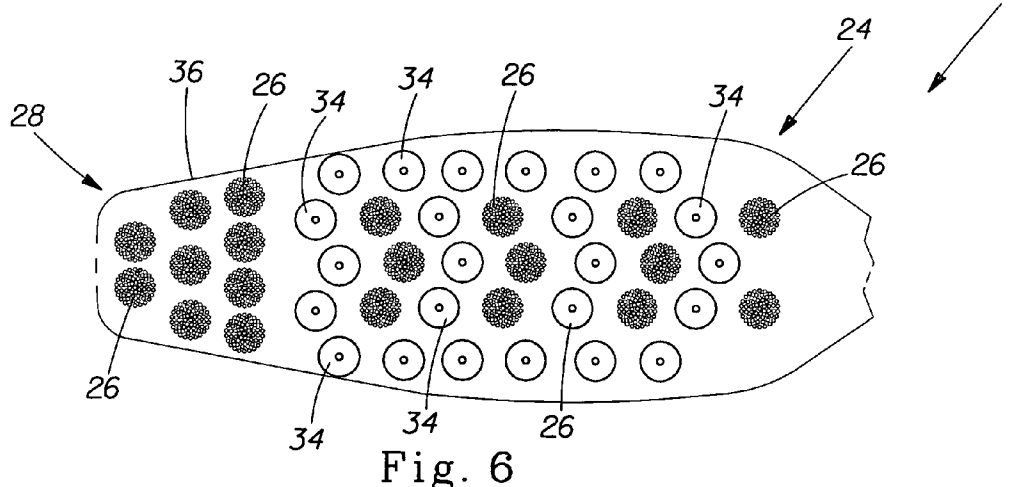


Fig. 6

**TOOTHBRUSHES**

**CROSS REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims the benefit of U.S. Provisional Application No. 60/620,611, filed Oct. 20, 2004, the substance of which is incorporated herein by reference.

**TECHNICAL FIELD OF THE INVENTION**

[0002] The present invention relates to toothbrushes, and, more particularly, to toothbrushes having a combination of bristle types.

**BACKGROUND OF THE INVENTION**

[0003] Toothbrushes utilizing various types of bristles are known. However, there is continued desire to provide improved cleaning, whitening, polishing, mouth feel, and/or other benefits.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0004] While the specification concludes with claims directed to the invention, it is believed that the present invention will be better understood from the following description taken in conjunction with the accompanying drawings in which:

[0005] **FIG. 1** is a side elevational view of a toothbrush made in accordance with the present invention.

[0006] **FIG. 2** is a top plan view of a tuft pattern for the head of the toothbrush of **FIG. 1**.

[0007] **FIG. 3** is a top plan view of another tuft pattern for the head of the toothbrush of **FIG. 1**.

[0008] **FIG. 4** is a top plan view of another tuft pattern for the head of the toothbrush of **FIG. 1**.

[0009] **FIG. 5** is a side elevational view of another bristle tuft profile suitable for use with the toothbrush of **FIG. 1**.

[0010] **FIG. 6** is a top plan view of another tuft pattern for the head of the toothbrush of **FIG. 1**.

**DETAILED DESCRIPTION OF THE INVENTION**

[0011] Reference will now be made to various embodiments of the present invention examples of which are illustrated in the accompanying drawings wherein like numerals indicate the same elements throughout the views. All patents publications referenced herein are incorporated herein by reference. The present invention is directed to toothbrushes generally, including both electric and manual toothbrushes. Referring to **FIG. 1**, a manual toothbrush **20** will now be described. The toothbrush **20** comprises a handle **22** and a head **24**. The head has a plurality of bristle tufts. The bristle tufts **26** disposed adjacent the free end **28** of the head **24** comprise bristles that comprise a slip agent which reduces the coefficient of friction of the bristle. Some slip agents which can be used are a fluorinated olefin polymer (e.g., poly(tetrafluoroethylene)), boron nitride, molybdenum disulfide, graphites, fullerene and talc. The slip agent can be admixed with the bristle material or can form part of a coating on the bristle. The tufts **26** of bristles are arranged in a group **28** at the free end **28** of the head **24**. An

example of one bristle suitable for use in the tufts **26** is described in USPN 2002/0120995.

[0012] Bristle tufts **32** are disposed along the inner portion of the head **24** and can extend from the group of tufts **28** to end of the head **24** that is connected to the handle **22**. The tufts **28** can be formed from bristles that have a micro or macro non-linear shape or texture associated with the bristles. Examples include crimped bristles, embossed bristles, flagged bristles, and bristles having scales, serrations, projections, pockets, dimples, or ridges about their outer surface. Some suitable bristles for tufts **28** are described in U.S. Pat. Nos. 6,058,541; 3,295,156; 4,373,541; 3,567,569; 4,616,374; 3,671,381; 5,770,307; 6,141,818; and 2,317,485.

[0013] Bristle tufts **34** are disposed adjacent the side edges **36** of the toothbrush head **24** and can extend from adjacent tufts **26** substantially along the length of the group of tufts **32**. Tufts **34** thus form one or more outer rows of tufts. Tufts **34** can be formed from non-textured bristles as are known in the art. An example of some non-textured bristles are illustrated in U.S. Pat. Nos. 6,151,745 and 5,926,897. The bristles of tufts **34** can be formed from a thermoplastic elastomer (e.g., natural or artificial rubber) or traditional polymeric materials such as NYLON. The bristle tufts **34** can also be provided in the form of upstanding elastomeric elements such as described in U.S. Pat. No. 6,371,294 and WO 00/76369. It is contemplated that bristle tufts **32** and **34** can be exchanged so that non-textured bristle tufts **34** are disposed along the interior of the head **24** and textured bristle tufts **32** form the outer tuft rows of head **24**. It is also contemplated that the bristle tufts **32** and **34** can be intermixed so that both disposed along the interior of the head **24** or both form the outer tuft rows of head **24**. As shown in **FIGS. 3 and 4**, the non-textured bristle tufts **34** may wholly or partially encircle the textured tufts **32**. The textured bristle tufts **32** may extend above the non-textured bristle tufts **34**, as seen in **FIG. 5**, in order to improve the effectiveness of the textured bristle tufts **32**. The bristle tufts **26** comprising bristles incorporating a slip agent may extend above both the textured bristle tufts **32** and the non-textured tufts **34** as seen in **FIGS. 1 and 5** for better cleaning.

[0014] In another embodiment of the present invention, the bristle tufts **26** comprising bristles incorporating a slip agent may be provided along the interior of the head **24**, as seen in **FIG. 6**. The bristle tufts **26** may wholly or partially fill the interior of the head **26**. In **FIG. 6**, the bristle tufts **26** are shown alternating with rows of non-textured bristle tufts **34**.

[0015] While the embodiments of the present invention have been described herein with respect to the bristle tuft profiles illustrated in **FIGS. 1 and 5**, it is contemplated that other bristle tuft profiles can be provided.

[0016] All documents cited in the Detailed Description of the Invention are, in relevant part, incorporated herein by reference; the citation for any document is not to be construed as an admission that it is prior art with respect to the present invention.

[0017] While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the

spirit and scope of the invention. It is therefore intended to cover in the appended claim all such changes and modifications that are within the scope of this invention.

What is claimed is:

1. A toothbrush, comprising:

a handle;

a head attached to said handle, said head having a free end most distal from said handle and opposed side edges;

a first group of bristle tufts disposed adjacent said free end of said head, said first group of bristle tufts comprising bristles having a slip agent;

a second group of bristle tufts disposed along the interior of said head, said second group of bristle tufts comprising textured bristles; and

a third group of bristle tufts disposed adjacent said side edges of said head, said third group of bristle tufts comprising non-textured bristles.

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