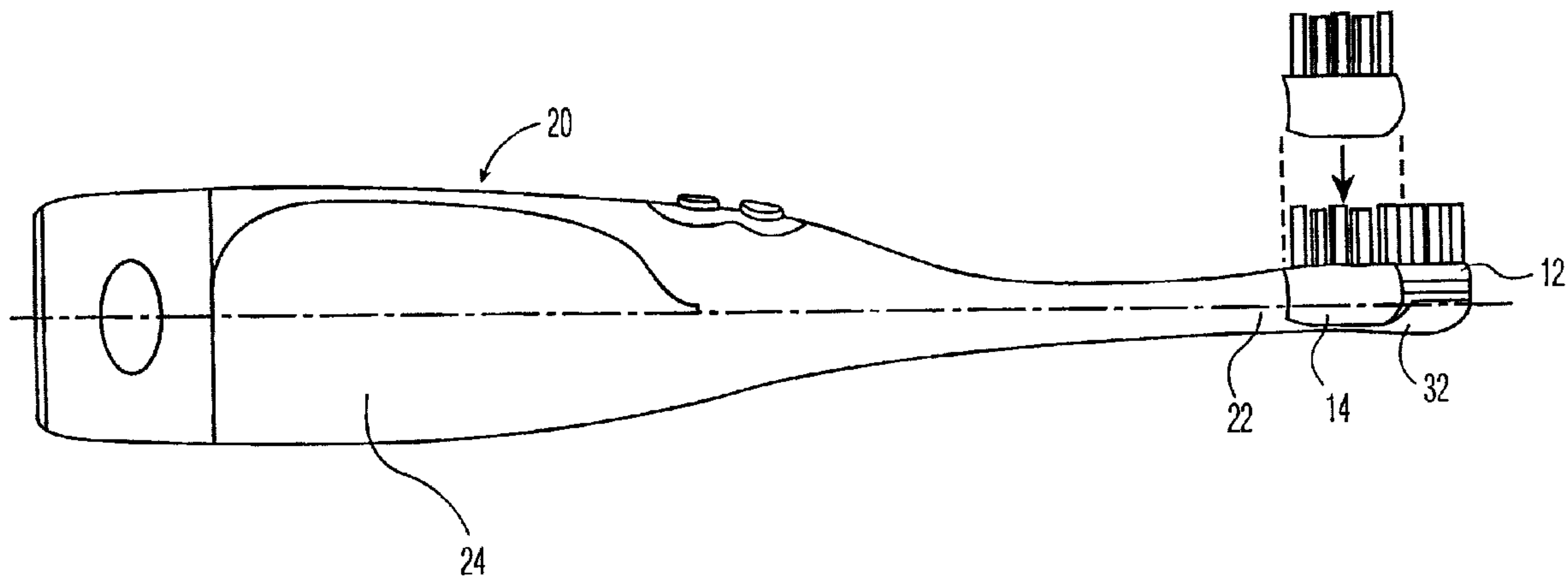




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(54) Titre : BROSSE POUR BROSSE A DENTS ELECTRIQUE
 (54) Title: BRUSH SECTION FOR AN ELECTRIC TOOTHBRUSH



(57) **Abrégé/Abstract:**

An electric toothbrush head section and method of manufacture thereof, which head section contains a movable and at least one static bristle bearing portions, wherein the static bristle bearing portion is interfitted into permanent engagement about the exterior of the head section, in a fashion to reduce the seepage of liquid therein.

ABSTRACT

An electric toothbrush head section and method of manufacture thereof, which head
5 section contains a movable and at least one static bristle bearing portions, wherein the
static bristle bearing portion is interfitted into permanent engagement about the exterior
of the head section, in a fashion to reduce the seepage of liquid therein.

BRUSH SECTION FOR AN ELECTRIC TOOTHBRUSH

FIELD OF THE INVENTION

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This invention pertains to a brush section for an electric toothbrush and a method of manufacture thereof, and more particularly to such a section having a moving bristle bearing portion and at least one static bristle bearing portion, wherein the static bristle bearing portion is mechanically held in interfitting engagement about the exterior of the
10 brush section.

BACKGROUND OF THE INVENTION

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The benefits of brushing one's teeth using toothbrushes are well known, and motorized movement in toothbrushes has been the subject to much recent innovation and design activity. The commercial market has seen the introduction, over the last several years, of many different types of such motorized toothbrushes. However, an examination of the available technology shows a tendency towards increasingly complex, expensive,
20 and non-commercially feasible methods of achieving motorized motions in the bristles and heads of toothbrushes to aid in more effective cleaning of one's teeth.

25

The commercial marketplace has been divided into tiered price markets. On the higher priced end are some of these more complex motorized toothbrushes that provide various motions to the bristles and brush head, which brush heads are replaceable when the bristles become worn. Intermediate priced brushes provide some simplification, including replaceable head sections; but, are still relatively expensive for the mass market. The lower priced end of the market includes brushes that only vibrate through the use of an offset weight attached to the motor shaft and which provide little true
30 additional cleaning benefit since no vigorous motion is transmitted to the cleaning surface of the teeth and newer simplified designed brushes which have generally fixed non-replaceable head sections, such that when the bristles become worn the toothbrush must be replaced.

US Patents 6,000,083 and 6,178,579 disclose newer low priced electric toothbrushes, wherein the brush head includes a circular moving bristle portion preferably located at the end of the brush head distal to the brush handle and adjacent to which circular moving
5 portion is a static bristle portion. The circular moving bristle portion is disclosed as containing stiffer bristles to aid in the deep cleaning and plaque removal process further back in the user's mouth; while the static bristle portion contains softer bristles, so as not to damage the gums. This combination of moving and static bristles provides the user with a more traditional, larger brush head than other electric brushes, which merely
10 contain circular bristle bearing heads; which larger brush head permits the user to brush his teeth in the typical manner of an up and down fashion. However, as disclosed within 6,000,083 and 6,178,579, the static bristle portion is integrally molded as part of the overall housing of the toothbrush. This integral configuration of the static bristle portion with the housing makes for inefficient tufting of the static bristle portion, as the housing
15 portion containing the static bristle portion must itself be manipulated into a tufter and leads to inefficiencies when a new design static bristle pattern is desired, as the entire mold of the housing portion containing the static bristle portion must be replaced.

US Patent 5,186,627 discloses a non-powered toothbrush having a combination of a
20 rotatable and fixed brush sections, wherein the fixed brush section is in snap-fit engagement within the outer cover of the toothbrush. Such a configuration, with the fixed brush section being retained within a surrounding cover, will allow seepage into the brush head and the accumulation of liquid therein, which may promote the undesired growth of bacteria and mold therein.

25

There is thus a need in the art for a design for an electric toothbrush head section which contains a combination of a movable and static bristles, wherein the static bristle portion is not integral with the housing of the brush head section, such that the static
30 bristle section can be efficiently tufted, such that a new design for the bristle static bristle pattern can be implemented without replacing the mold for the portion of the head section in which the static bristle portion is contained, and such that seepage into the brush head is reduced to avoid the undesired growth of bacteria and mold therein.

62301-2243 (S)

Brief Summary of the Invention

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The present invention is directed to an electric toothbrush head section containing a moving bristle bearing portion and at least one static, i.e. fixed or non-movable, bristle bearing portion and to a method of manufacture thereof, wherein the static bristle bearing portion is molded, tufted and interfitted into permanent engagement about the exterior of the head section. In a preferred embodiment, the moving bristle bearing portion is circular in cross-section and the static bristle portion is an u-shaped, wherein the sides of the "u" are interfitted about the exterior of the brush head. Such a u-shaped configuration of the static bristle bearing portion provides for easy manipulation thereof during the manufacture process and provides for an overlap thereof about the exterior of the head section to reduce the seepage of liquid into the head section, to avoid the undesirable growth of bacteria and mold therein. The interfitted joint between the u-shaped static bristle portion and the head section is preferably a rib or groove, wherein the rib and groove may be carried by either the bristle bearing portion or the brush section.

20 The circular bristle bearing portion is preferably located adjacent the front end of the head section, distal from the handle of the electric toothbrush from which said head section extends. The preferred circular bristle bearing portion may rotate, swivel, gyrate, oscillate or reciprocate about an axis substantially normal to the longitudinal axis of the head section. The static bristle portion or portions may be located adjacent to the circular
25 bristle bearing portion and on one or more sides thereof.

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One aspect of the invention provides an electric toothbrush head section comprising a circular movable bristle bearing portion and at least one static bristle bearing portion having non-movable bristles, wherein the static bristle bearing portion is permanently secured about the exterior of said head section by interfitting means and against a retaining wall in a manner to reduce seepage of liquid therein.

Another aspect of the invention provides a method of manufacture of an electric toothbrush head section containing a circular movable bristle bearing portion and at least one static bristle bearing portion comprising molding said at least one static bristle bearing portion, tufting said at least one static bristle bearing portion with non-movable bristles and interfitting said at least one static bristle bearing portion about the exterior of said toothbrush head section, whereby said at least one static bristle bearing portion is permanently secured about said toothbrush head section by interfitting means and against a retaining wall in a manner to reduce seepage of liquid therein during use thereof.

A further aspect of the invention provides an electrically driven toothbrush comprising: a handle portion at a first end of said toothbrush; a head section at a second end of said toothbrush comprising a generally circular movable bristle bearing portion and at least one static bristle bearing portion having non-movable bristles, wherein the static bristle bearing portion is permanently secured about the exterior of said head section by interfitting means and against a retaining wall in a manner to reduce seepage of liquid therein; and a rotatable, integrally formed shaft extending from said handle portion to said head section and having a first longitudinal central

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axis; wherein the generally circular movable bristle bearing portion is pivotally mounted to said head section on a post having a second longitudinal axis and drivingly engaged by a remote-most end of said shaft, said bristle bearing portion
5 having a first closed-ended slot extending radially inward from the outer circumference of said portion to less than the distance to the center of said holder to receive and retain said remote-most end of said shaft.

Brief Description of the Drawings

The ensuing description of the invention will be understood more readily from the accompanying drawings, in which:

Fig. 1 is front view of an electric toothbrush containing a head section of the present invention having a circular bristle bearing portion and a static bristle bearing portion;

Fig. 2 is side elevation view of the electric toothbrush of Fig. 1;

Fig. 3 is fragmentary sectional view of the side of the head section of the electric toothbrush of Fig. 1;

Fig. 4 is a sectional view of Fig. 1 taken along lines B-B, showing a preferred embodiment of the present invention, wherein the u-shaped static bristle bearing portion is mechanically held in interfitting engagement with the brush head section by a rib and groove closure.

Detailed Description of the Invention

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Referring to Fig. 1, which illustrates an electric toothbrush 20 having a head section 22 of the present invention containing a combination of a circular moving bristle bearing portion 12 and a static, bristle bearing portion 14, wherein the static bristle bearing portion 14 is in the form of a u-shape which is held by interfitted closure about the exterior of the head section 22. The interfitted closure is a permanent closure, to avoid the possibility of the static bristle portion 14 becoming loose during usage and being swallowed or choking the user. The head section 22 is shown in Fig. 1 integrally attached, i.e. permanently attached, to the balance of the electric toothbrush handle 24; however, the present invention can alternatively be used in conjunction with a head section 22 which is demountably attached, i.e. temporarily attached, to the balance of the electric toothbrush handle 24.

30

Fig. 2 is a side elevation view of the electric toothbrush 20 of Fig. 1, wherein the static bristle bearing portion 14 of the present invention is shown in two positions, a first position as a tufted component, which tufted component is then interfitted about the head section 22 mechanically, as shown by the arrow; whereby it assumes the second position as part of the shown completed toothbrush. The relatively small size of the static bristle bearing portion 14 and its u-shape, allow the easy manipulation of multiple static bristle bearing portions to be simultaneously pre-tufted in an efficient manner.

Referring to Fig. 3, an enlarged sectional view of the side of the head section 22 of Fig 1 is provided wherein the circular bristle bearing portion 12 is shown with bristle tufts 10; supported by an axis 13 and motivated by a drive shaft 15 as disclosed in US Patent 5,625,916. In combination with the circular bristle bearing portion 12 is a static bristle bearing portion 14 with bristle tufts 10 also extending therefrom. This configuration of a circular bristle bearing portion located adjacent the front end of the head section 22, distal from the handle 24 of the electric toothbrush 20 and the static bristle bearing portion 14 located immediately adjacent thereto is preferred. However, the static bristle bearing portion 14 may be located adjacent the front end of the head section 22 and the circular bristle bearing portion 12 located adjacent thereto and more proximate to the handle 24. Further, the circular bristle bearing portion 12 may be located more centrally within the head, with the static bristle bearing portion 14 located on opposite sides of the head with respect thereto, as is shown in US Patents 5,186,627 and 6,000,083.

Fig. 4, a sectional view of the head section of the present invention looking along section B-B of Fig. 1, shows a preferred interfitting rib 28 and groove 26 configuration to permanently attach the static bristle bearing portion 14 about the exterior of the head section 22. The rib may be carried by the head section 22, as shown, or by the static bristle bearing portion 14. To hold the static bristle bearing portion 14 securely in position along the longitudinal axis of the head section 22, a retaining wall 30 is provided extending transverse to the longitudinal axis of the brush head 22 and toward the handle 24 thereof, and a pair of extending flanges (not shown) are provided extend from the head section 22 at the front end, i.e. distal from the handle 24, of the static bristle bearing

portion 14. The pair of extending flanges are positioned to seat against the front end, i.e. the end distal to the handle 24, of the static bristle bearing portion 14; while, the other end of the static bristle bearing portion 14 seats against the retaining wall 30, such that the static bristle bearing portion 14 is held securely between the pair of extending flanges
5 and the retaining wall 30.

In other embodiments, the static bristle bearing portion 14 may be held about the head section 22 may be by other known male/female interfitting means or by being welded thereon. Such welding can be by ultrasonic, laser, hot air or other known means, which
10 while more costly than a mechanical interfitting closure, may provide the additional benefit of further reducing seepage of liquid into the toothbrush head section 22. Further, the joining of the static bristle bearing portion 14 to the head section 22 may be by use of an adhesive bond.

15 The head section 22 and static bristle bearing portion 14 can be molded of a variety of flexible resilient materials, such as polyamide, i.e. nylon; polyester or a co-polyester; acrylonitrile butadiene styrene (ABS); polycyclohexylene dimethylene terphthalate that is acid modified (PCTA); or polypropylene; preferably polypropylene or if a "transparent" appearance is desired of polyester. A suitable polypropylene, is available from Huntsman
20 Corporation, Longview, Texas 75603, under the trade-designation Huntsman Polypropylene P4G3Z-039. Another suitable polypropylene is available from Amoco Polymers, Inc., Alpharetta, Georgia 30202-3914, sold under the trade-designation 7635.

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CLAIMS:

1. An electric toothbrush head section comprising a circular movable bristle bearing portion and at least one static bristle bearing portion having non-movable bristles,
5 wherein the static bristle bearing portion is permanently secured about the exterior of said head section by interfitting means and against a retaining wall in a manner to reduce seepage of liquid therein.
2. The electric toothbrush head section of claim 1,
10 wherein the static bristle bearing portion is u-shaped.
3. The electric toothbrush head section of claim 2, wherein said interfitting means consists of an interlocking rib and groove.
4. The electric toothbrush head section of claim 1,
15 wherein the at least one static bristle bearing portion is secured by welding means.
5. A method of manufacture of an electric toothbrush head section containing a circular movable bristle bearing portion and at least one static bristle bearing portion
20 comprising molding said at least one static bristle bearing portion, tufting said at least one static bristle bearing portion with non-movable bristles and interfitting said at least one static bristle bearing portion about the exterior of said toothbrush head section, whereby said at least one
25 static bristle bearing portion is permanently secured about said toothbrush head section by interfitting means and against a retaining wall in a manner to reduce seepage of liquid therein during use thereof.

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6. The method of manufacture of an electric toothbrush head section of claim 5, wherein the static bristle bearing portion is u-shaped.

7. The method of manufacture of an electric
5 toothbrush head section of claim 5, wherein said interfitting means consists of an interlocking rib and groove.

8. The method of manufacture of an electric
10 toothbrush head section of claim 5, wherein the static bristle bearing portion is secured about said toothbrush head section by welding means.

9. An electrically driven toothbrush comprising:

a handle portion at a first end of said
toothbrush;

15 a head section at a second end of said toothbrush comprising a generally circular movable bristle bearing portion and at least one static bristle bearing portion having non-movable bristles, wherein the static bristle bearing portion is permanently secured about the exterior of
20 said head section by interfitting means and against a retaining wall in a manner to reduce seepage of liquid therein; and

a rotatable, integrally formed shaft extending
from said handle portion to said head section and having a
25 first longitudinal central axis;

wherein the generally circular movable bristle bearing portion is pivotally mounted to said head section on a post having a second longitudinal axis and drivingly engaged by a remote-most end of said shaft, said bristle
30 bearing portion having a first closed-ended slot extending

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radially inward from the outer circumference of said portion to less than the distance to the center of said holder to receive and retain said remote-most end of said shaft.

10. The electrically driven toothbrush of claim 9,
5 wherein the static bristle bearing portion is u-shaped.

11. The electrically driven toothbrush of claim 10,
wherein said interfitting means consists of an interlocking
rib and groove.

12. The electrically driven toothbrush of claim 9,
10 wherein the at least one static bristle bearing portion is
secured by welding means.

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PATENT AGENTS

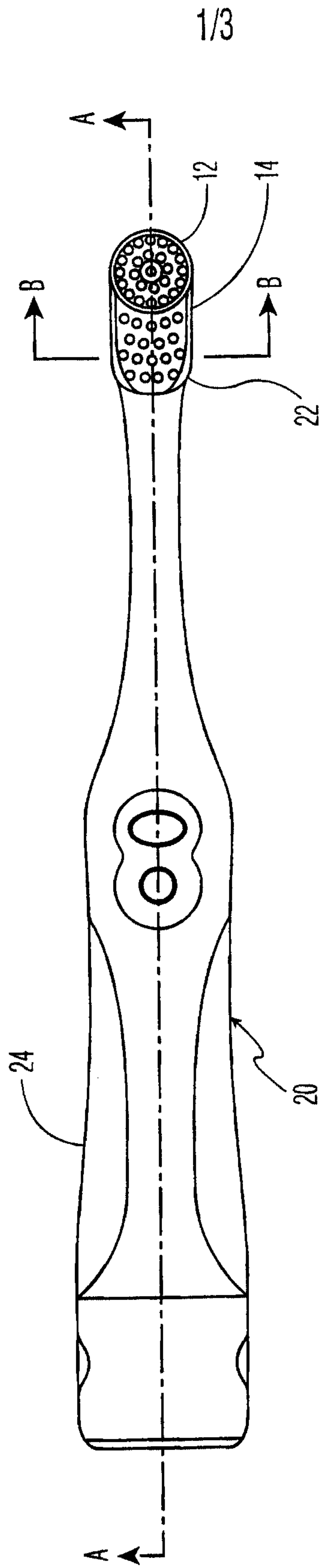


FIG. 1

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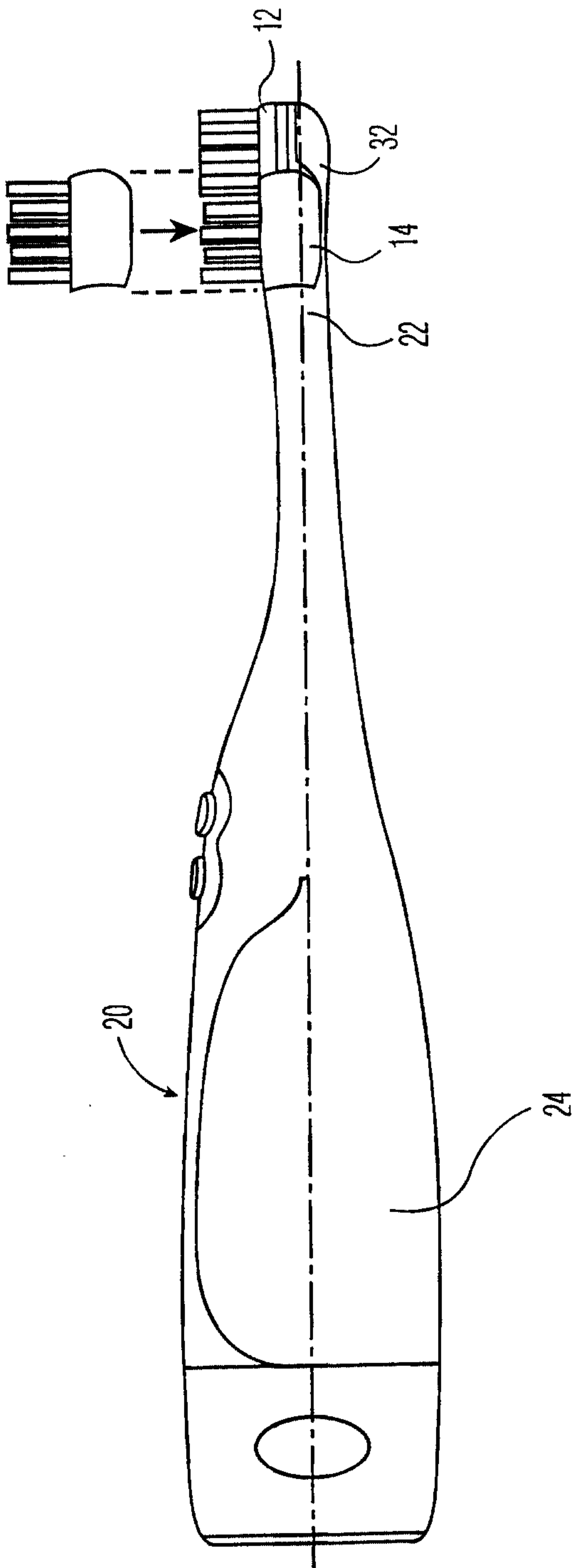


FIG. 2

3/3

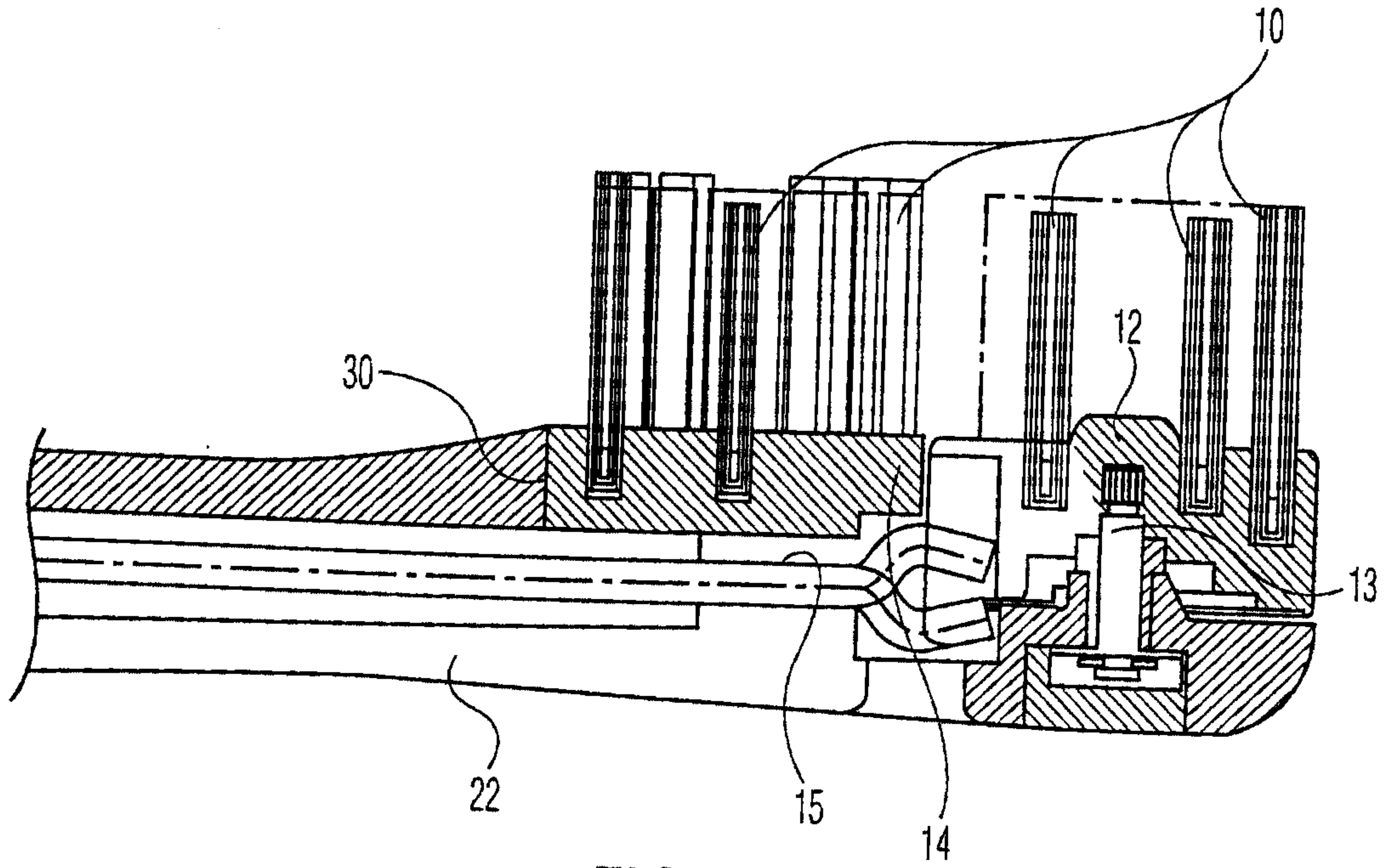


FIG. 3

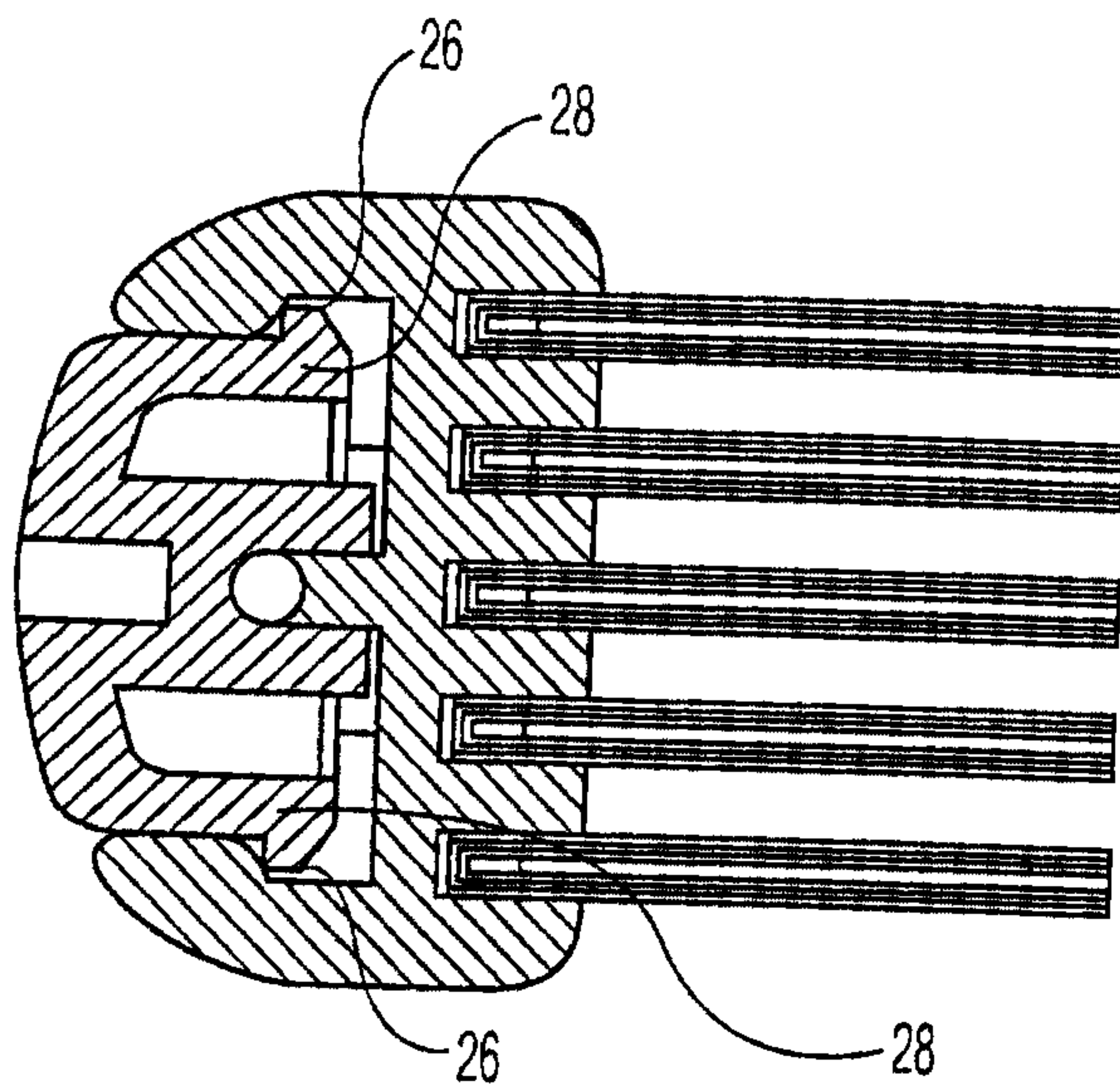


FIG. 4

