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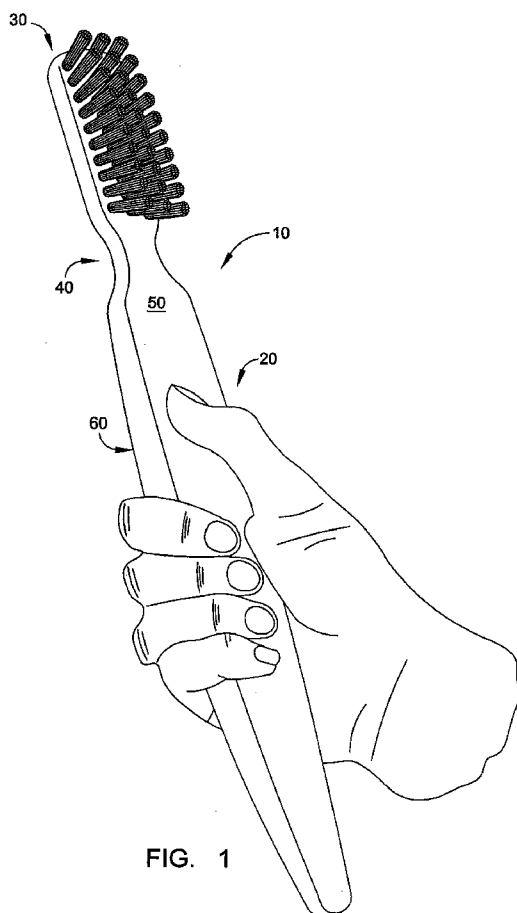


FIG. 1

(57) Abstract: A disposable toothbrush includes a toothbrush head including a top surface and a plurality of bristles extending substantially perpendicularly from the top surface, the toothbrush head including one or more holes therein; a neck connected to the toothbrush head; and a toothbrush handle connected to the toothbrush head and graspable by a user's hand, the toothbrush handle including a fluid and a fluid actuation mechanism operable by a user's hand for causing the fluid in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles.

DISPOSABLE TOOTHBRUSH AND METHOD

FIELD OF THE INVENTION

[01] The present invention relates to disposable toothbrushes for brushing and cleaning one's teeth.

BACKGROUND OF THE INVENTION

[02] Disposable toothbrushes have been used in the past for brushing and cleaning one's teeth, and disposing of the toothbrush after a single use. Use of a disposable toothbrush has required a separate container of toothpaste and a separate water source. A user wets toothbrush bristles of the disposable toothbrush using the water source (e.g., water from a water faucet) and applies toothpaste from the separate container of toothpaste to the toothbrush bristles. Alternatively, the user applies toothpaste from the separate container of toothpaste to the toothbrush bristles and then wets the toothbrush bristles/toothpaste using the water source. The user then brushes and cleans one teeth in a well-know manner using the toothbrush. The user disposes of the toothbrush after a single use. One of the problems with these disposable toothbrushes is that use of the disposable toothbrush requires a separate container of toothpaste and a separate water source. A separate container of toothpaste and a separate water source (e.g., water faucet) may not be available in all instances. Thus, use of these disposable toothbrushes has been limited to where all three items (toothbrush, toothpaste, water) are present.

SUMMARY OF THE INVENTION

[03] The present invention involves a disposable toothbrush that solves the above problems and others.

[04] An aspect of the invention involves disposable toothbrush including a toothbrush head having a top surface and a plurality of bristles extending substantially perpendicularly from the top surface, the toothbrush head including one or more holes therein; a neck connected to the toothbrush head; and a toothbrush handle connected to the toothbrush head and graspable by a user's hand, the toothbrush handle including a fluid and a fluid actuation mechanism operable by a user's hand for causing the fluid in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles.

[05] Another aspect of the invention involves a method of using a disposable toothbrush. The method includes providing a disposable toothbrush including a toothbrush head including a top surface and a plurality of bristles extending substantially perpendicularly from the top surface, the toothbrush head including one or more holes therein; a neck connected to the toothbrush head; a toothbrush handle connected to the toothbrush head and graspable by a user's hand, the toothbrush handle including a fluid and a fluid actuation mechanism operable by a user's hand for causing the fluid in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles; activating the fluid actuation mechanism with the user's hand so that the fluid in the toothbrush handle flows through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles; using the disposable toothbrush with toothpaste on the bristles for brushing the user's teeth; and disposing of the disposable toothbrush after use.

BRIEF DESCRIPTION OF THE DRAWINGS

[06] FIG. 1 is a perspective view of an embodiment of a disposable toothbrush shown being gripped in the hand of a user;

[07] FIG. 2 is an enlarged top perspective view of an embodiment of head of the disposable toothbrush of FIG. 1;

[08] FIG. 3 is an enlarged perspective view of an embodiment of bundle of bristles of the disposable toothbrush of FIGS. 1 and 2;

[09] FIG. 4 is an enlarged perspective view of an embodiment of single bristle of the disposable toothbrush of FIGS. 1-3;

[10] FIG. 5 is an enlarged bottom perspective view of an embodiment of the head of the disposable toothbrush and shows an embodiment of the distal portion of a water supply mechanism incorporated into the disposable toothbrush;

[11] FIG. 6 is a perspective view of an embodiment a toothbrush handle of the disposable toothbrush and shows the proximal portion of a water supply mechanism illustrated in FIG. 5;

[12] FIG. 7 is a perspective view of another embodiment of a disposable toothbrush.

[13] FIG. 8 is a perspective view of a lower removable portion of the disposable toothbrush of FIG. 7.

[14] FIG. 9 is another perspective view of the lower removable portion of the disposable toothbrush of FIG. 7.

[15] FIG. 10A is a perspective view of another embodiment of a disposable toothbrush in a re-sealable package.

[16] FIG. 10B is a top perspective view of the disposable toothbrush in FIG. 10A, with the re-sealable package not shown.

[17] FIG. 11 is an alternative top perspective view of the disposable toothbrush in FIG. 10B.

[18] FIG. 12A is a rear perspective view of the disposable toothbrush in FIG. 10B.

[19] FIG. 12B is a rear perspective view of the disposable toothbrush in FIG. 10B with a twist-open mouthwash container shown removed from the rest of the toothbrush.

[20] FIG. 13 is a perspective view of the disposable toothbrush shown being inserted into the re-sealable package after use.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[21] With reference to FIGS. 1-6, an embodiment of a disposable toothbrush 10 and method of using the same will be described.

[22] The disposable toothbrush 10 includes an elongated handle 20 to be gripped by a hand of a user, a toothbrush head 30, and a neck 40 connecting the toothbrush head 30 to the handle 20. In the embodiment shown, the handle 20 includes a hard plastic top surface 50, and a flexible body 60 (e.g., made of rubber) connected to the hard plastic top surface 50. The flexible body 60 forms an outer squeezable bladder.

[23] With reference to FIGS. 2-4, the toothbrush head 30 includes multiple rows of bristle bundles 70. Each bundle 70 includes a plurality of elongated bristles 80 extending substantially perpendicular out of a top surface 90 of the toothbrush head 30. As shown in FIG. 4, each bristle 80 includes a toothpaste composition coating 100 at least partially covering the bristle 80. The toothpaste composition coating 100 is activated by the application of water thereto.

[24] With reference to FIGS. 5 and 6, the disposable toothbrush 10 includes a water supply mechanism 110 incorporated into the disposable toothbrush 10 for applying water to the toothpaste composition coating 100 to activate the coating 100 on the

bristles 80. The water supply mechanism 110 includes an elongated inner squeezable bladder 120 filled with water disposed inside of the handle 20 (i.e. inside a chamber formed by the hard plastic top surface 50 and the flexible body 60). In an alternative embodiment, instead of an inner squeezable bladder and an outer squeezable bladder, the disposable toothbrush includes a single squeezable bladder including water therein. One or more connection tubes ("connector(s)") 130 connect the elongated inner squeezable bladder 120 to a water applicator 140. Although the water applicator 140 is shown as a single faucet-like mechanism, in alternative embodiments, the applicator 140 includes one or more members (having a similar or different configuration/construction) for applying water to the coating 100 on the bristles 80. A membrane 150 is disposed in the one or more connections 130 to prevent water in the inner squeezable bladder 120 from accidentally escaping the inner squeezable bladder 120.

[25] The disposable toothbrush 100 will now be described in use. In certain situations (e.g., on an airplane, at work, after a meal) outside of the home, it is desirable to have a disposable toothbrush handy to brush one's teeth and then dispose of the toothbrush. To use the disposable toothbrush 100, a user breaks the membrane 150 and squeezes the flexible body 60 (i.e., outer squeezable bladder), causing external pressure to be imparted to the inner squeezable bladder 120. This increased pressure in the inner squeezable bladder 120 (and one or more connectors 130) causes the membrane 150 to break or rupture (alternatively, membrane 150 includes a pull tab that a user pulls/removes to open the one or more connectors 130), allowing water flow there through in the direction of the arrows shown. Water flows from the one or more connectors 130 through the water applicator(s) 140 to the coating 100 on the bristles

80. The coating 100 on the bristles 80 is activated by the water, causing the bristles to foam up. The user then brushes one's teeth using the disposable toothbrush 10 in a normal manner. When the user is done brushing one's teeth, the toothbrush (and any external packaging and/or membrane 150) is disposed of.

[26] In one or more additional embodiments, the disposable toothbrush 100 includes water supply mechanisms 110 other than those shown and described. For example, but not by way of limitation, in an alternative embodiment, the handle 20 includes a water reservoir that holds water and the water reservoir is coupled to the toothbrush bristles by a controllable valve. The valve is normally in a closed position to prevent water from accidentally escaping the inner squeezable bladder 120. To activate the coating 100 on the bristles 80, the valve is opened so that water from the reservoir is used to contact the coating 100 on the bristles 80 to activate the coating 100. In a first implementation, the reservoir is squeezable so that squeezing or applying external pressure to the reservoir causes water to flow to the coating 100 on the bristles 80. In this implementation, the valve is a one-way valve or a movable valve. In another implementation, the reservoir is rigid and the valve is a movable valve that is moved to an open position to activate the coating with water. After the valve is open, a user may tilt the toothbrush head 30 downwards so that gravity causes water to flow out of the reservoir, through the valve, and onto the coating 100 on the bristles 80.

[27] Thus, the disposable toothbrush 10 includes water, toothpaste composition, and toothbrush integrated into a simple, one-piece device. The disposable toothbrush 10 allows one to easily clean one's teeth in certain situations (e.g., on an airplane, at work, after a meal) outside of the home without the need for a separate water source and toothpaste.

[28] With reference to FIGS. 7-9, another embodiment of a disposable toothbrush 210 will be described. The disposable toothbrush 210 includes an elongated handle 220 to be gripped by a hand of a user, a toothbrush head (not shown), and a neck 240 connecting the toothbrush head to the handle 220. In the embodiment shown, the handle 220 is a two-part handle with an upper, first cylindrical section 250 housing a flexible water bladder 260 and a lower, second cylindrical section 270 housing a flexible mouth-rinse bladder 280. A bottom portion of the first cylindrical section 250 includes external threads and a top portion 290 of the second cylindrical section 280 includes internal threads 295 for rotatably connecting the second cylindrical section 280 to the first cylindrical section 250.

[29] The first cylindrical section 250 includes an outer cylindrical member 300 with a window 310 therein for pressing the flexible water bladder 260 for dispensing water on the tooth-paste covered bristles 80 in a manner similar to that described with respect to FIGS. 1-6. Pressing on the flexible water bladder 260 breaks a membrane (e.g., membrane 150), causing water to be dispensed onto the tooth-paste covered bristles 80 to activate the tooth paste composition.

[30] The second cylindrical section 280 includes an outer member 320 with a window 330 therein for pressing the flexible mouth-rinse bladder 280 for dispensing mouth-rinse solution into cup 340 (FIG. 8). The cup 340 is formed by rotatably de-coupling the second cylindrical section 280 from the first cylindrical section 250 (i.e., the rest of the handle 220) and turning the second cylindrical section 280 so that its open end faces upward. Pressing on the flexible mouth-rinse bladder 280 breaks a membrane, causing mouth-rinse solution to be dispensed into cup 340. As shown in FIG. 9, the cup 340 is then tipped/angled downwardly to allow the mouth-rinse solution to be dispensed into

the user's mouth. The user may rinse his or her mouth with the mouth-rinse solution before and/or after brushing one's teeth.

[31] In alternative embodiments, one or more valves may be used in the toothbrush 210 instead of membranes and/or the second cylindrical section 280 does not de-couple from the rest of the handle 220 (i.e., a user simply tips/angles the bottom of the second cylindrical section 280 towards/into a user's mouth and presses on the flexible mouth-rinse bladder 280, breaking a membrane and causing mouth-rinse solution to be dispensed directly into the user's mouth).

[32] With reference to FIGS. 10A-13, another embodiment of a disposable 400 toothbrush will be described. The disposable toothbrush 400 is used with a re-sealable package 405. The re-sealable package 405 includes a closed first end 407 and an openable/re-sealable second end 409. The disposable toothbrush 400 is purchased or provided with the disposable toothbrush 400 sealed in a pocket 411 of the re-sealable package 405 (i.e., with the openable/re-sealable second end 409 sealed closed). In the embodiment shown, the pocket 411 includes a moisture absorbing back card that give the re-sealable package 405 structure/shape, especially when the disposable toothbrush 400 is removed from the re-sealable package 405, and is used to collect and absorb liquid waste from the user expelled from the user's mouth after brushing with the disposable toothbrush 400 and/or moisture/liquid waste on the disposable toothbrush 400 after the disposable toothbrush 400 is inserted into the re-sealable package 405 and the re-sealable package 405 is sealed as shown in FIG. 13. In the embodiment shown, the moisture absorbing back card is substantially rectangular and extends substantially the width and length of the re-sealable package 405.

[33] As shown in FIGS. 10A-11, the disposable toothbrush 400 includes an elongated handle 420 to be gripped by a hand of a user, a toothbrush head 430 with bristles 480, and a neck 440 connecting the toothbrush head 430 to the handle 420. In the embodiment shown, the handle 420 includes a flexible body 460 that has an outer squeezable bladder.

[34] As shown in FIGS. 12A and 12B, the handle 420 includes a twist-off, twist-open mouthwash container or cup 440. The mouthwash container 440 is connected to the rest of the handle 420 through a tearable/breakable perforated shrink graphics label 445. The mouthwash container 440 includes a frusto-conical male portion 450 that is normally received within a frusto-conical female portion 460. A terminating end of the frusto-conical male portion 450 includes a removable head 470 (e.g., twist-off head, tear strip) that is removed to access the mouthwash in the removed mouthwash container 440.

[35] The disposable toothbrush 400 is a self-contained, single-use, disposable toothbrush with self contained paste and mouthwash. Liquid waste and the used toothbrush 400 are disposed of in the re-sealable package 405. Squeezing the flexible body 460 of the handle 420 forces water and/or toothpaste gel up through the molded brush head 430 in a manner similar to that described above with respect to FIGS. 1-9.

[36] As shown in FIGS. 12A and 12B, the perforated shrink graphics label 445 is torn open or removed by the user to release the removable mouthwash container 440 from the rest of the handle 420. The mouthwash container 440 is removed from the handle 420 and the removable head 470 is removed (e.g., twisted off, torn off) to access the mouthwash in the removed mouthwash container 440.

[37] With reference to FIG. 13, the user may expel liquid waste from one's mouth through the open end 409 of the package 405, into the re-sealable package 405. The used toothbrush 400 is inserted into the pocket 411 of the package 405 and the re-sealable end 409 is re-sealed. The package 405 and toothbrush 400 is then disposed of in a proper trash receptacle.

[38] The above description of the disclosed embodiments is provided to enable any person skilled in the art to make or use the invention. Various modifications to these embodiments will be readily apparent to those skilled in the art, and the generic principles described herein can be applied to other embodiments without departing from the spirit or scope of the invention. Thus, it is to be understood that the description and drawings presented herein represent a presently preferred embodiment of the invention and are therefore representative of the subject matter which is broadly contemplated by the present invention. It is further understood that the scope of the present invention fully encompasses other embodiments that may become obvious to those skilled in the art and that the scope of the present invention is accordingly limited by nothing other than the appended claims.

What is claimed is:

1. A disposable toothbrush, comprising:

a toothbrush head including a top surface and a plurality of bristles extending substantially perpendicularly from the top surface, the toothbrush head including one or more holes therein;

a neck connected to the toothbrush head;

a toothbrush handle connected to the toothbrush head and graspable by a user's hand, the toothbrush handle including a fluid and a fluid actuation mechanism operable by a user's hand for causing the fluid in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles.

2. The disposable toothbrush of claim 1, wherein the fluid is water and the bristles are tooth-paste covered bristles pre-coated with a dry toothpaste composition, and the fluid actuation mechanism is operable by a user's hand for causing the water in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for activating the dry toothpaste composition on the tooth-paste covered bristles.

3. The disposable toothbrush of claim 1, wherein the fluid is a toothpaste gel, and the fluid actuation mechanism is operable by a user's hand for causing the toothpaste gel in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles.

4. The disposable toothbrush of claim 1, wherein the fluid actuation mechanism includes a pressable bladder where pressure imparted to the bladder by the user's hand

causes the fluid in the bladder in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles.

5. The disposable toothbrush of claim 1, wherein the fluid actuation mechanism includes a valve that is actuated by the user's hand to cause the fluid in the bladder in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles.

6. The disposable toothbrush of claim 1, wherein the toothbrush handle includes a detachable end for supplying mouthwash to a user.

7. The disposable toothbrush of claim 6, wherein the detachable end is a detachable container including mouthwash.

8. The disposable toothbrush of claim 1, further including a re-sealable package that is openable for removing the disposable toothbrush for use, disposing of liquid waste in the re-sealable package, and inserting the used disposable toothbrush, and re-sealable for sealing the liquid waste and the used disposable toothbrush therein for disposal of the liquid waste, used disposable toothbrush, and re-sealable package.

9. The disposable toothbrush of claim 1, wherein the re-sealable package includes a moisture absorbing member therein for absorbing the liquid waste.

10. A method of using a disposable toothbrush, comprising:

providing a disposable toothbrush including a toothbrush head including a top surface and a plurality of bristles extending substantially perpendicularly from the top surface, the toothbrush head including one or more holes therein; a neck connected to the toothbrush head; a toothbrush handle connected to the toothbrush head and

graspable by a user's hand, the toothbrush handle including a fluid and a fluid actuation mechanism operable by a user's hand for causing the fluid in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles;

activating the fluid actuation mechanism with the user's hand so that the fluid in the toothbrush handle flows through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles;

using the disposable toothbrush with toothpaste on the bristles for brushing the user's teeth;

disposing of the disposable toothbrush after use.

11. The method of claim 10, wherein the fluid is water and the bristles are toothpaste covered bristles pre-coated with a dry toothpaste composition, and the fluid actuation mechanism is operable by a user's hand for causing the water in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for activating the dry toothpaste composition on the tooth-paste covered bristles.

12. The method of claim 10, wherein the fluid is a toothpaste gel, and the fluid actuation mechanism is operable by a user's hand for causing the toothpaste gel in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles.

13. The method of claim 10, wherein the fluid actuation mechanism includes a pressable bladder where pressure imparted to the bladder by the user's hand causes the fluid in the bladder in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles.

14. The method of claim 10, wherein the fluid actuation mechanism includes a valve that is actuated by the user's hand to cause the fluid in the bladder in the toothbrush handle to flow through the neck, through the head, and through the one or more holes of the toothbrush head to contact the plurality of bristles for providing a toothpaste on the bristles.

15. The method of claim 10, wherein the toothbrush handle includes a detachable end for supplying mouthwash to a user, and the method further includes detaching the detachable end from the disposable toothbrush and supplying mouthwash to a user.

16. The method of claim 15, wherein the detachable end is a detachable container including mouthwash.

17. The method of claim 10, wherein providing a disposable toothbrush further includes providing a re-sealable package that is openable for removing the disposable toothbrush for use, disposing of liquid waste in the re-sealable package, and inserting the used disposable toothbrush, and re-sealable for sealing the liquid waste and the used disposable toothbrush therein for disposal of the liquid waste, used disposable toothbrush, and re-sealable package, and the method includes opening the re-sealable package, removing the disposable toothbrush for use, using the disposable toothbrush to brush the user's teeth, disposing of liquid waste in the re-sealable package, inserting the used disposable toothbrush in the re-sealable package, and sealing the liquid waste

and the used disposable toothbrush therein for disposal of the liquid waste, used disposable toothbrush, and re-sealable package.

18. The method of claim 17, wherein the re-sealable package includes a moisture absorbing member therein for absorbing the liquid waste, and the method further includes absorbing liquid waste in the re-sealable package with the moisture absorbing member.

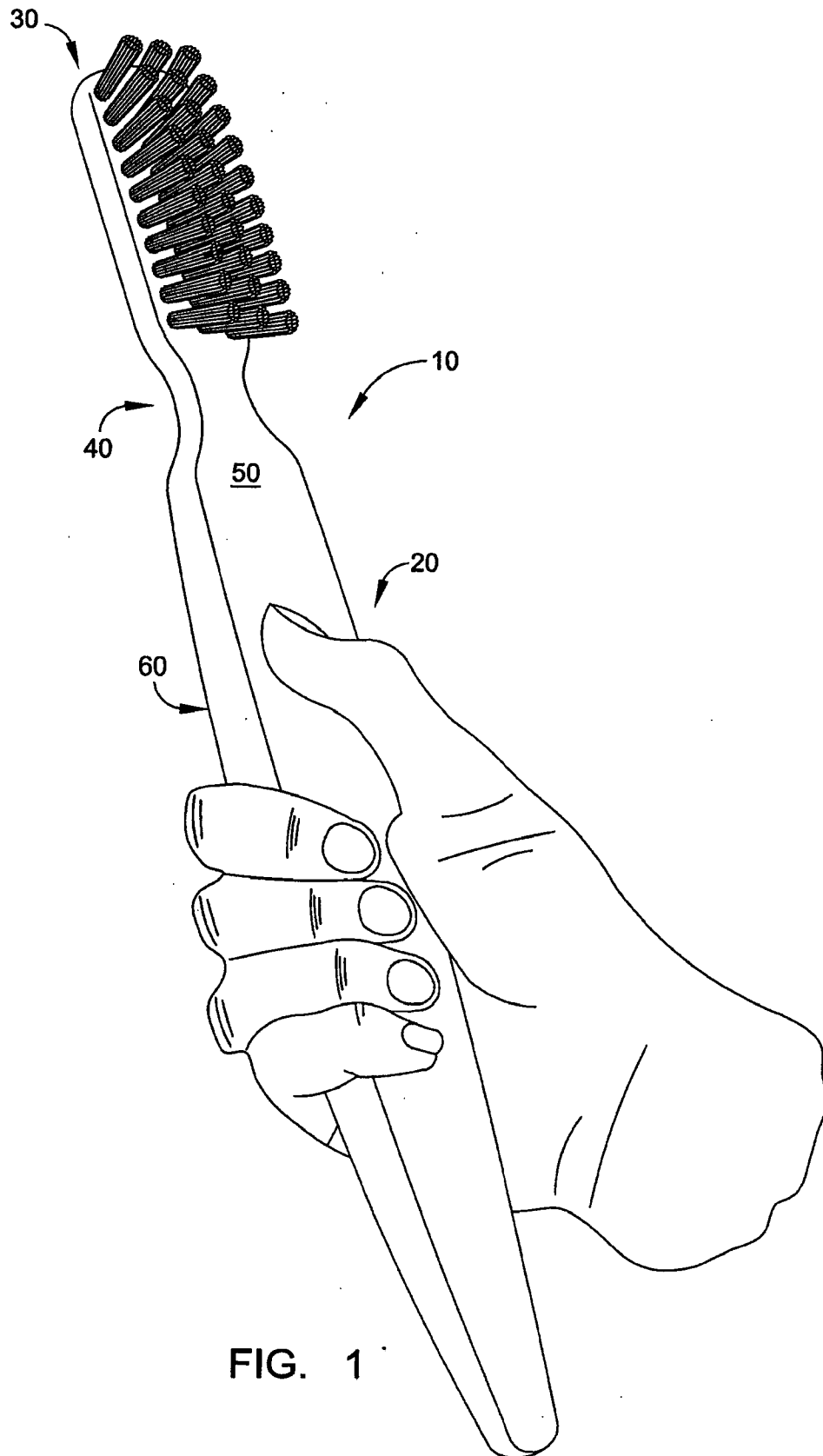


FIG. 1

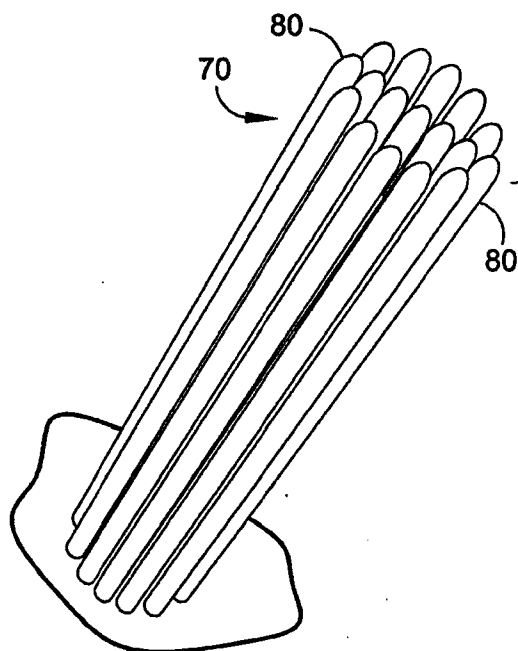
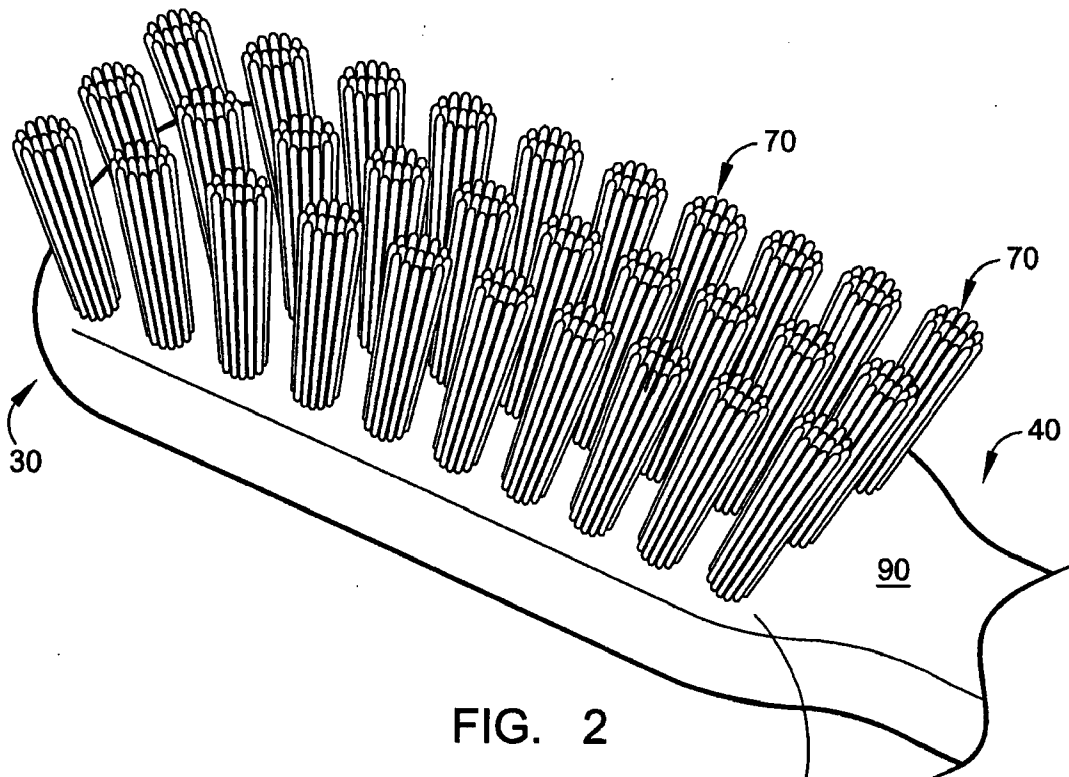


FIG. 3

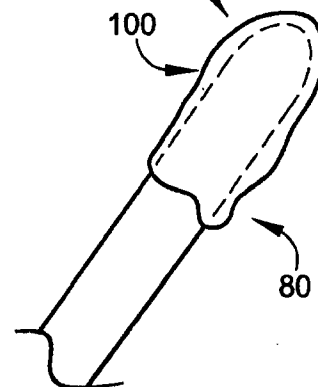


FIG. 4

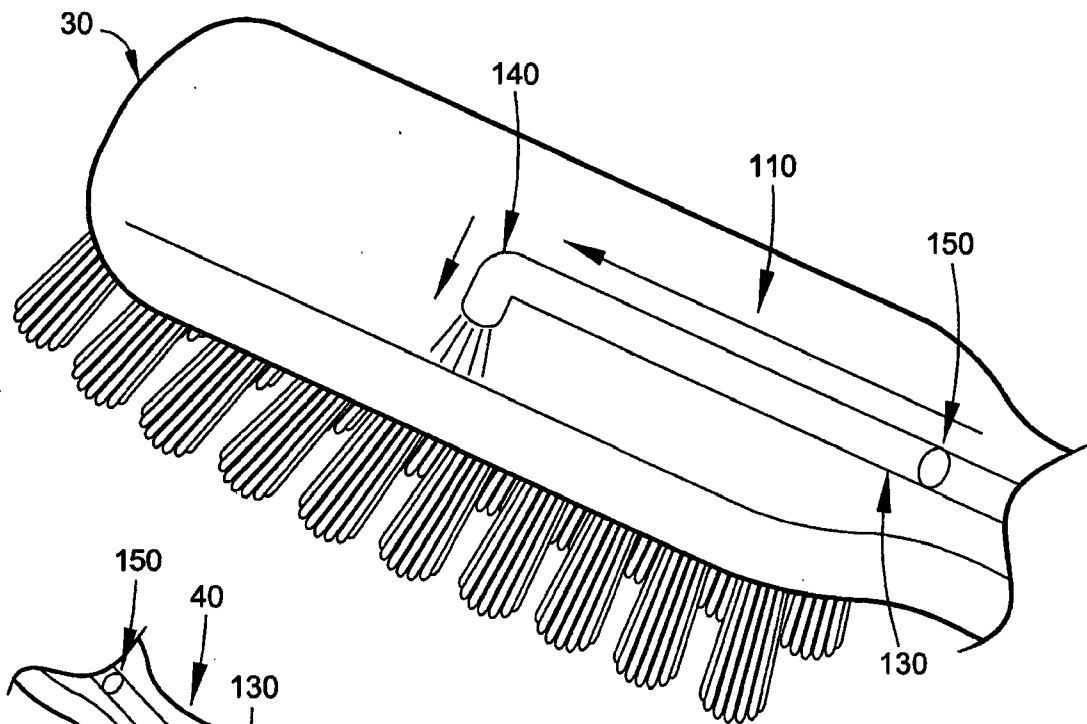


FIG. 5

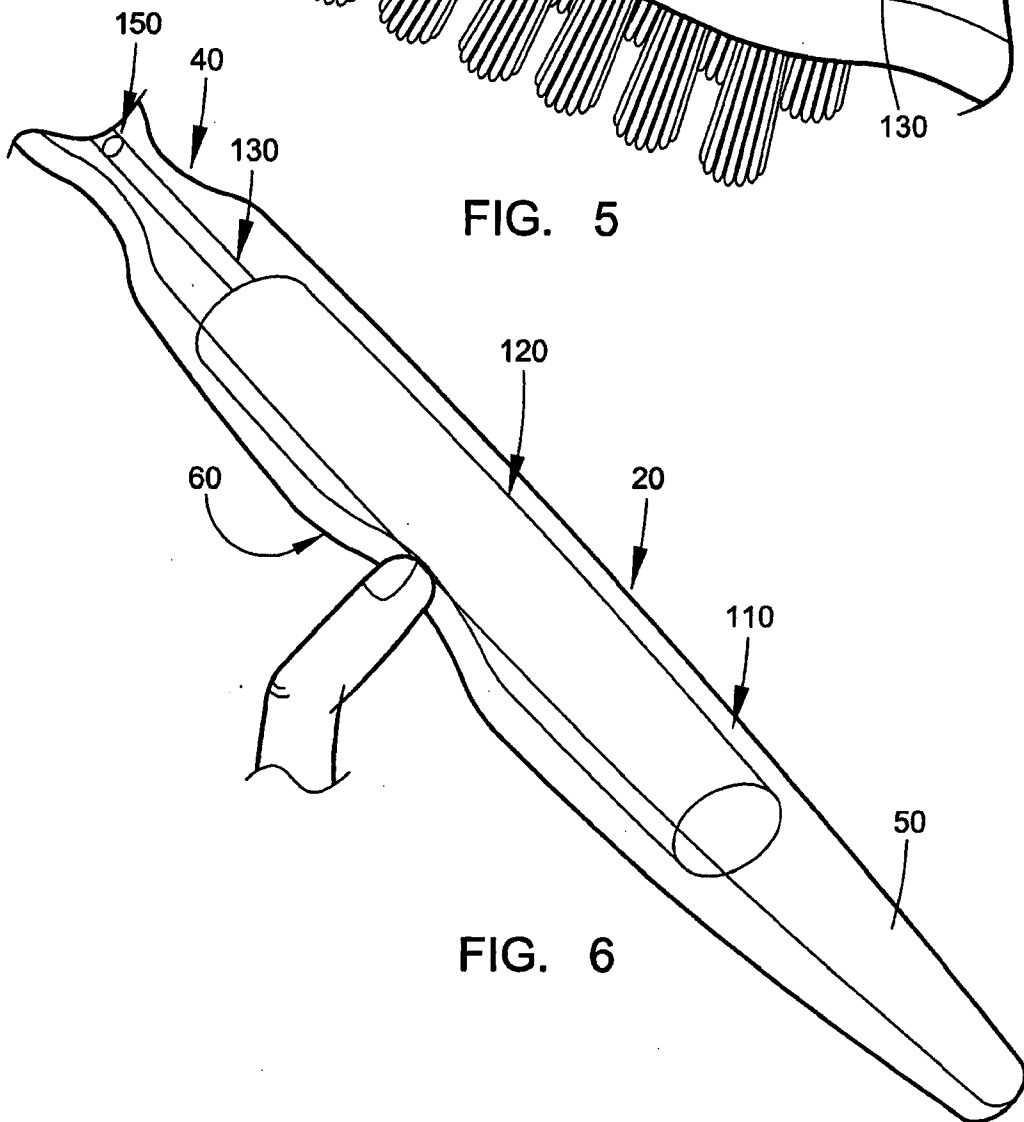
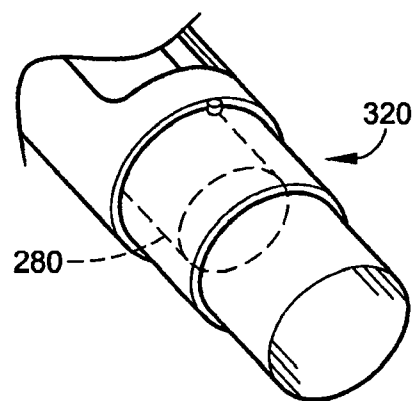
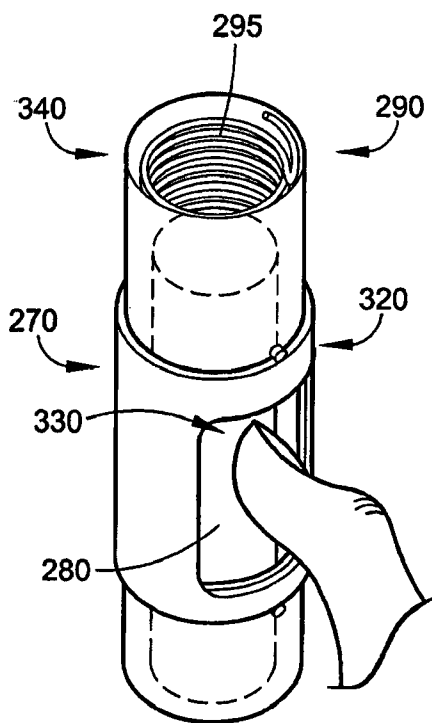
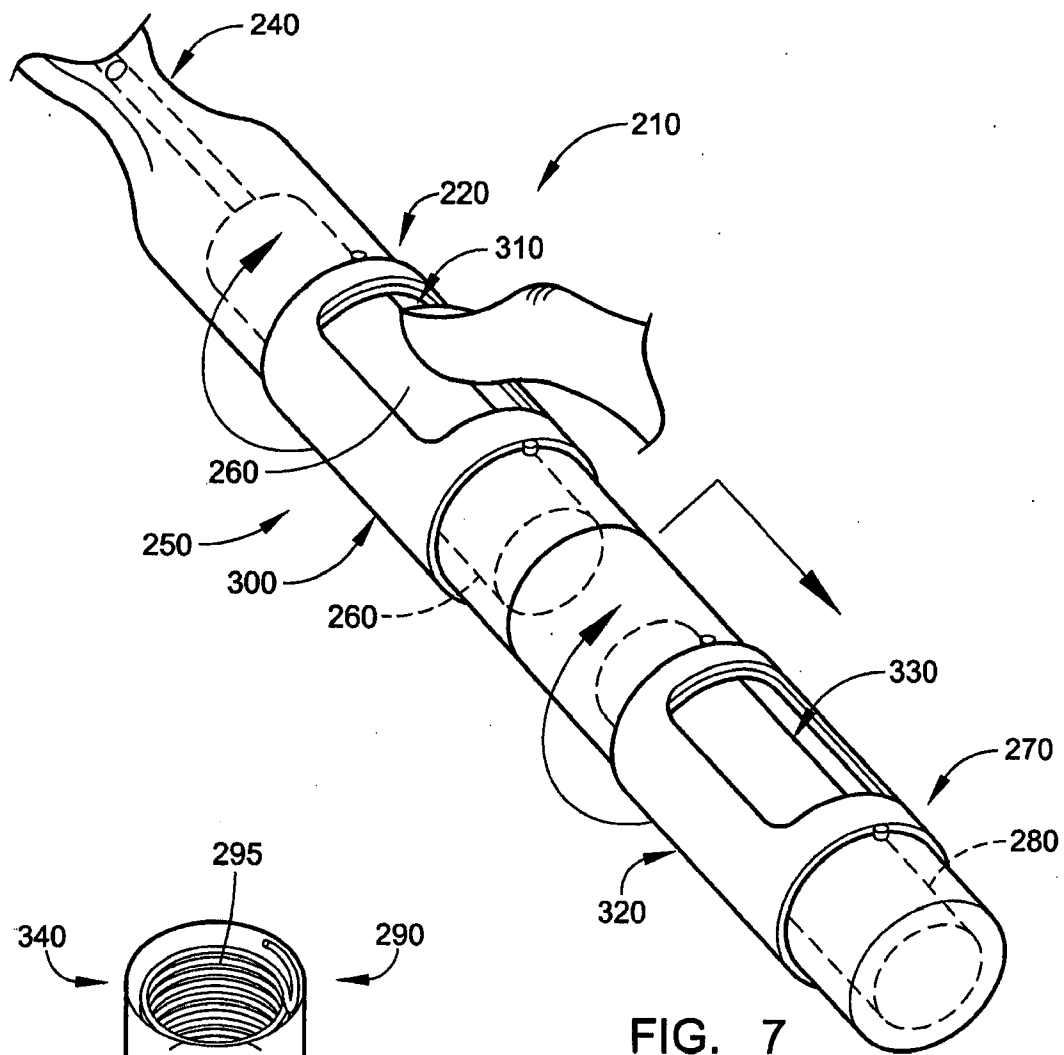


FIG. 6



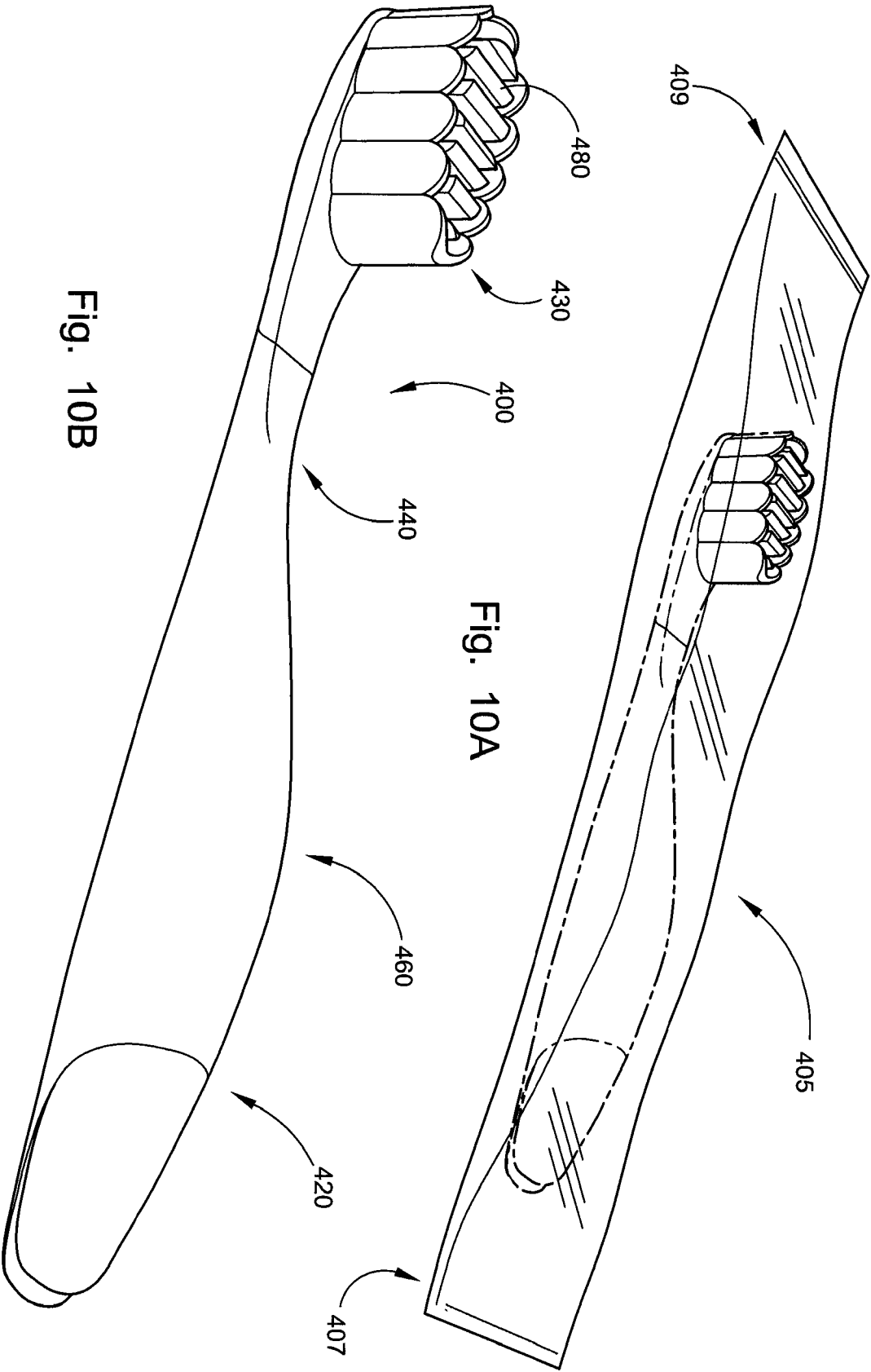


Fig. 10B

Fig. 10A

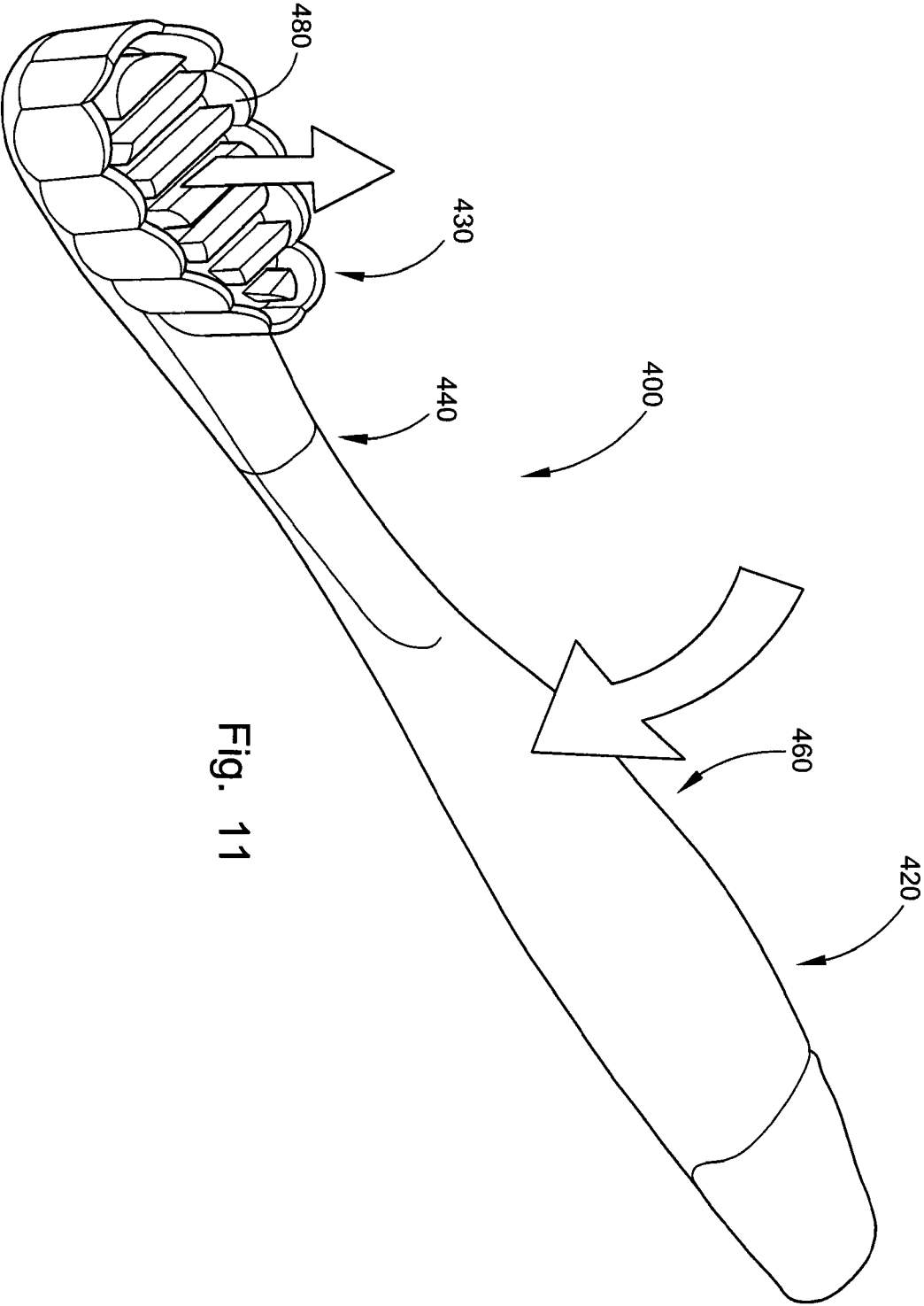
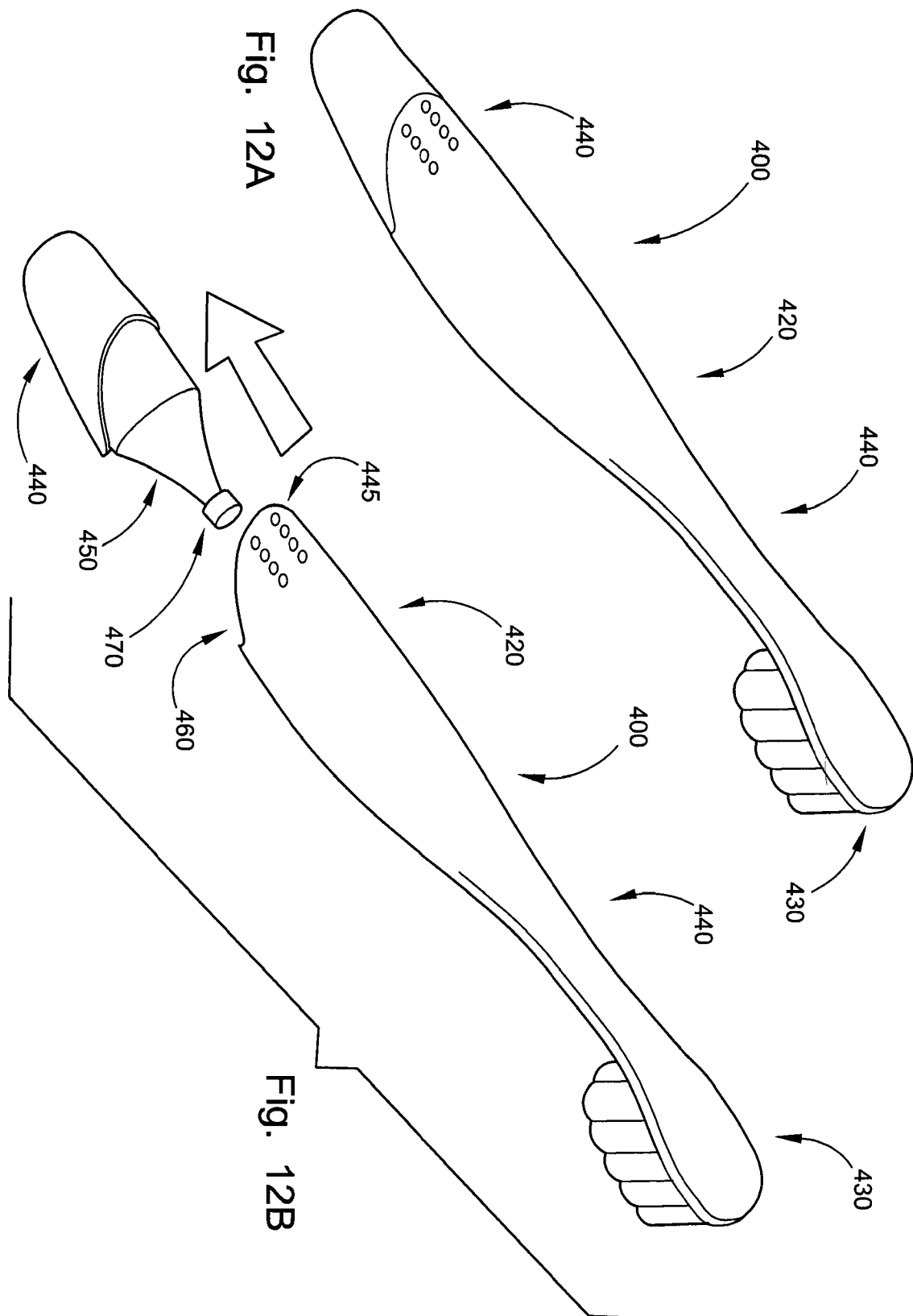


Fig. 11



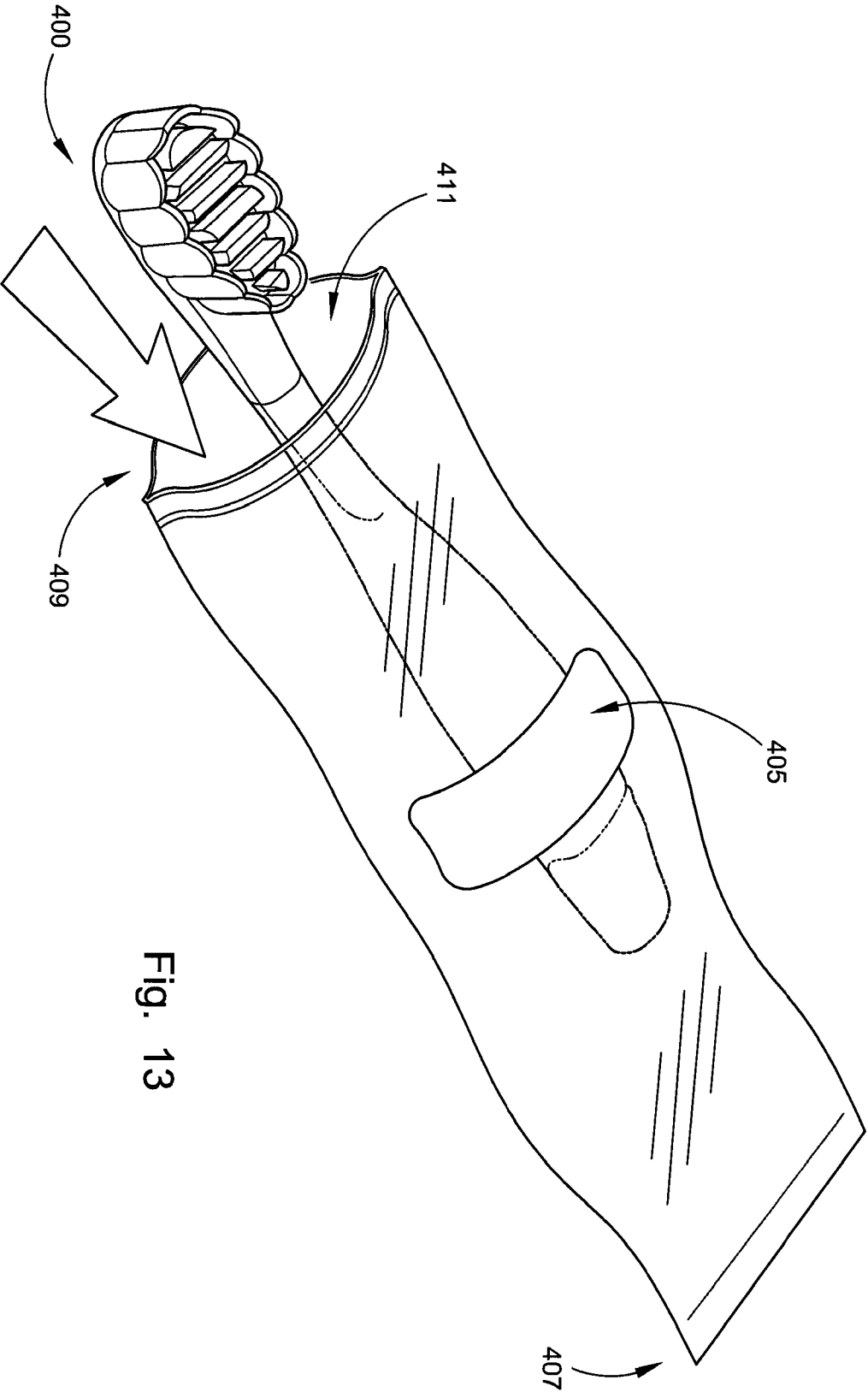


Fig. 13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/065333**A. CLASSIFICATION OF SUBJECT MATTER****A46B 11/02(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 A46B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models since 1975

Japanese Utility models and application for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS(KIPO internal)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ----- Y	US 6,715,952 B1 (AIKEN, RICARDO and ROOPCHAND, REISHA) 06 April 2004 See figures 1-5; column 3, lines 15-53.	1,2,4-7,10,11,13-16 ----- 8,17
X ----- Y	KR 20-0295230 Y1(LEE, JAE WAN) 18 November 2002 See page 2; figures 1-2.	1,3,4,10,12,13 ----- 8,17
Y	KR 10-2003-0031461 A (SEHYANG INDUSTRIAL CO., LTD.) 21 April 2003] See figure 1; claim 1.	8,17
A	JP 2005-058768 A (TRISA HOLDING AG) 10 March 2005 See figures 1-12; abstract.	1-18

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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