PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : A46B 11/00 — A1

(11) International Publication Number: **WO 00/53053**

(43) International Publication Date: 14 September 2000 (14.09.00)

(21) International Application Number: PCT/IB99/01875

(22) International Filing Date: 24 November 1999 (24.11.99)

(30) Priority Data:

99/1909	10 March 1999 (10.03.99)	ZA
99/2652	12 April 1999 (12.04.99)	ZA

(71) Applicant *(for all designated States except US)*: TRI-CONCEPTS (PROPRIETARY) LIMITED [ZA/ZA]; 62 Merz Street, 2400 Heidelberg (ZA).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: SARGENT, Bruce, Alan [ZA/ZA]; 17 Arnheim Street, Hazelpark, 1401 Germiston (ZA).

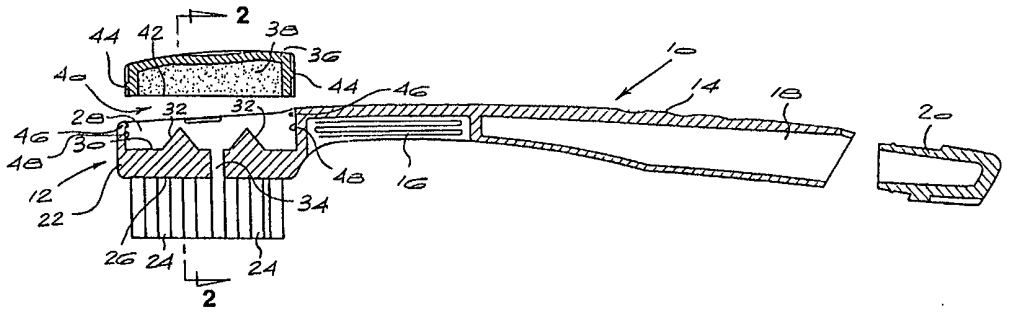
(74) Agents: COCHRANE, David, Hylton et al.; Spoor and Fisher, Rochester Place, 173 Rivonia Road, Morningside, Sandton, P.O. Box 41312, 2024 Craighall (ZA).

(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published

With international search report.

(54) Title: A DISPOSABLE TOOTHBRUSH



(57) Abstract

This invention relates to a compact disposable toothbrush in combination with a toothpaste dispenser for use by travellers and persons suffering from oral diseases. The toothbrush comprises a toothbrush head (12) which included a base (22), bristles (24) and a cap (36). The cap (36) contains toothpaste behind a sealed membrane (42), or within a sachet (not shown). In use, the cap is pressed laterally relative to the head (22), pointed ridges (32) perforate the membrane (42) and the toothpaste is caused to flow through an aperture (34) in the base (22) to the bristles (24). The handle (14) of the toothbrush includes a first cavity (16) containing a supply of dental floss and a second cavity (18) containing a supply of mouthwash. According to a preferred embodiment of the invention the toothpaste and mouthwash contain active ingredients for treating oral diseases.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	**ES**	Spain	**LS**	Lesotho	**SI**	Slovenia
AM	Armenia	**FI**	Finland	**LT**	Lithuania	**SK**	Slovakia
AT	Austria	**FR**	France	**LU**	Luxembourg	**SN**	Senegal
AU	Australia	**GA**	Gabon	**LV**	Latvia	**SZ**	Swaziland
AZ	Azerbaijan	**GB**	United Kingdom	**MC**	Monaco	**TD**	Chad
BA	Bosnia and Herzegovina	**GE**	Georgia	**MD**	Republic of Moldova	**TG**	Togo
BB	Barbados	**GH**	Ghana	**MG**	Madagascar	**TJ**	Tajikistan
BE	Belgium	**GN**	Guinea	**MK**	The former Yugoslav Republic of Macedonia	**TM**	Turkmenistan
BF	Burkina Faso	**GR**	Greece			**TR**	Turkey
BG	Bulgaria	**HU**	Hungary	**ML**	Mali	**TT**	Trinidad and Tobago
BJ	Benin	**IE**	Ireland	**MN**	Mongolia	**UA**	Ukraine
BR	Brazil	**IL**	Israel	**MR**	Mauritania	**UG**	Uganda
BY	Belarus	**IS**	Iceland	**MW**	Malawi	**US**	United States of America
CA	Canada	**IT**	Italy	**MX**	Mexico	**UZ**	Uzbekistan
CF	Central African Republic	**JP**	Japan	**NE**	Niger	**VN**	Viet Nam
CG	Congo	**KE**	Kenya	**NL**	Netherlands	**YU**	Yugoslavia
CH	Switzerland	**KG**	Kyrgyzstan	**NO**	Norway	**ZW**	Zimbabwe
CI	Côte d'Ivoire	**KP**	Democratic People's Republic of Korea	**NZ**	New Zealand		
CM	Cameroon			**PL**	Poland		
CN	China	**KR**	Republic of Korea	**PT**	Portugal		
CU	Cuba	**KZ**	Kazakstan	**RO**	Romania		
CZ	Czech Republic	**LC**	Saint Lucia	**RU**	Russian Federation		
DE	Germany	**LI**	Liechtenstein	**SD**	Sudan		
DK	Denmark	**LK**	Sri Lanka	**SE**	Sweden		
EE	Estonia	**LR**	Liberia	**SG**	Singapore		

A DISPOSABLE TOOTHBRUSH

BACKGROUND OF THE INVENTION

THIS invention relates to a toothbrush, more particularly to a disposable toothbrush which includes a toothpaste dispenser.

Disposable toothbrushes are used particularly by travellers to brush their teeth in toilet facilities along the route on which they are travelling. It is convenient for the toothbrush to be in combination with a toothpaste dispenser and also to be disposable, so that the traveller can easily buy a toothbrush or be given one, use it once, and then throw it away.

Another use for disposable toothbrushes is in treating oral diseases. Persons afflicted with oral diseases can very often only use a toothbrush once as subsequent use of the toothbrush can re-infect the person or introduce bacteria into the mouth of the person.

It is an object of this invention to provide a new compact disposable toothbrush in combination with a toothpaste dispenser, for use in particular by travellers and persons suffering from oral diseases.

SUMMARY OF THE INVENTION

According to the invention there is provided a toothbrush and toothpaste dispenser unit comprising:

a longitudinally extending brush head attached, or attachable, to a brush handle;
a plurality of bristles extending from the brush head;
a supply cavity in the brush head for containing a supply of toothpaste;
at least one aperture extending through the brush head, bringing the supply cavity into communication with the bristles; and
plunger means movable laterally relative to the brush head from a first inoperative position to a second operative position wherein toothpaste is forced from the supply cavity, via the at least one aperture in the brush head, to the bristles.

Advantageously, the toothpaste supply is contained within a sealed cartridge within the brush head.

Typically, the sealed cartridge includes a perforatable membrane.

Advantageously, the cartridge is a sachet made from a plastics film or a foil.

According to another aspect of the invention there is provided a toothbrush and toothpaste dispenser unit comprising:

a longitudinally extending brush head attached, or attachable, to a brush handle;
a plurality of bristles extending from the brush head;

a supply cavity in the brush head for containing a supply of toothpaste;

a membrane for sealing the supply of toothpaste from the atmosphere; and

at least one aperture extending through the brush head, bringing the supply cavity into communication with the bristles.

Preferably, the toothbrush includes plunger means movable from a first inoperative position to a second operative position wherein the membrane is broken and toothpaste is forced from the supply cavity, via the at least one aperture in the brush head, to the bristles.

Advantageously, the toothpaste is contained in a sachet made from a plastics film or a foil, contained within the supply cavity.

The plunger means is preferably in the form of a cap, the cap having a cavity and an opening thereto, wherein the cavity in the cap defines the supply cavity.

The sachet mentioned above is conveniently contained within the supply cavity in the cap.

Alternatively, the supply of toothpaste is contained within the supply cavity in the cap and the opening to the cavity is sealed with a perforatable membrane, for example a plastics film or a foil.

The brush head preferably includes perforating means, for perforating the membrane when the plunger is moved from the inoperative position to the operative position.

Typically, the perforating means is a pointed ridge or spike formed integrally with the brush head.

Advantageously, the brush head includes locking means for locking the plunger in the second operative position.

The brush handle preferably includes a first cavity for storing a supply of dental floss and also a second cavity for storing a supply of mouthwash.

Preferably, the toothpaste includes an active ingredient for the treatment of an oral disease, such as gingivitis, perdontitis, carries, calculus and dentinal hypersensitivity.

Advantageously, the mouthwash also includes an active ingredient for the treatment of an oral disease, such as gingivitis, perdontitis, carries, calculus and dentinal hypersensitivity.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an exploded side cross-sectional view of a disposable toothbrush according to a first embodiment of the invention;

Figure 2 is a cross-section view of Figure 1 through the line 2-2;

Figure 3 is a cross-sectional side view of the disposable toothbrush of Figure 1 in an inoperative position;

Figure 4 is a cross-sectional side view of disposable toothbrush of Figure 1 in an operative position;

Figure 5 is a cross-sectional side view of a disposable toothbrush according to a second embodiment of the invention;

Figure 6 is a pictorial view of a sachet containing toothpaste for the disposable toothbrush shown in Figure 5;

Figure 7 is cross-sectional side view of the disposable toothbrush shown in Figure 5, in an inoperative position; and

Figure 8 is a cross-sectional side view of the disposable toothbrush of Figure 5, in an operative position.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to Figure 1, a disposable toothbrush 10 according to a first embodiment of the invention includes a longitudinally extending brush head shown generally by the numeral 12 with a brush handle 14. The brush handle 14 is made of a ridged plastics material such as polypropylene or styrene. The brush handle 14 includes a first cavity 16 for retaining a supply of dental floss and a second cavity 18 for containing a supply of mouthwash. A flexible removable end cap 20 is provided for closing the cavity 18.

Referring to Figures 1 and 2, the brush head 12 includes a base 22 formed integrally with the handle 14 and is made from the same material as the handle. The base 22 has an outer surface 26 to which is secured a number of bristles 24. The bristles 24 are arranged to lie substantially perpendicular relative to the surface 26. The base 22 also defines a cavity 28 having a floor 30. Projections, in the form of pointed ridges 32 are formed integrally with and extend from the floor 30. An aperture 34 extends through the

brush head 12, linking the cavity 28 to the bristles 24 communicatively. The brush head 12 further includes a plunger cap 36 which is made from a flexible material such as low density polyethylene or more preferably thermoplastic elastomer (TPE). The plunger cap 36 defines a supply cavity 38 with an opening 40 into the supply cavity 38. The opening 40 is sealed closed by a perforatable membrane 42 which is made from a plastics film or foil. A single supply of toothpaste (shown by stippling) is contained within the supply cavity 38, behind the membrane 42. The cap 36 further includes a peripheral projection 44 which is engageable with first and second projections 46 and 48 on an inner side wall 49 of the cavity 28 in the base 22. The projection 44 is also arranged to form a seal with the inner side wall 49 of the cavity 28.

Referring to Figure 3, the cap 36 is pressed onto the base 22 so that the projections 44 on the cap 36 engage with the first projections 46 on the side wall 49 of the base 22, thereby locking the cap 36 onto the base 22. The cap 36 is now in a first inoperative position, with the toothbrush 10 ready for sale or storage. The membrane 42 seals the supply of toothpaste (shown by stippling) from the atmosphere and ensures that the toothpaste is not contaminated by germs and that it does not dry out.

Referring to Figure 4, in use, the cap 36 is pressed, like a plunger, from the first inoperative position shown in Figure 3, laterally relative to the brush head 12, to the second operative position shown in Figure 4. During the lateral movement, the pointed ridges 32 perforate the membrane 42 and toothpaste (shown by stippling) is forced through the aperture 34 and onto the bristles 24. The peripheral projection 44 engages sealingly with the inner side wall 49 to stop toothpaste from escaping between the cap 36 and the inner side wall 49. The flexible cap 36 also ensures that most of the toothpaste (shown by stippling) is pressed out of the supply cavity when the cap is depressed. The toothbrush may then be used by a user, with

toothpaste already on the bristles. After brushing, the user may use the mouthwash to wash his/her mouth out and then may use the dental floss 48 for further cleaning of the teeth. Once in the second operative position, the peripheral projection 44 on the cap 36 engage with the second projections 48 on the base 22, locking the cap 36 in place, so that the toothbrush may only be used once.

Referring to Figure 5, according to a second embodiment of the invention, toothpaste (shown by stippling) is contained within the cap 36 within a sachet 50. Referring to Figure 6, the sachet 50 is shaped to fit within the supply cavity 38 in the cap 36 and is made from a plastics film or a foil. Referring back to Figure 5, in this embodiment, the projections 32 shown in Figure 1 are replaced with blocks 52 which are formed integrally with the base 22 of the brush head 12. The blocks substantially fill the cavity 28 in the base 22 and support spikes 54 which are formed integrally therewith.

Referring to Figure 7, in an inoperative position, the cap 36 clips onto the base 22 in the same way as Figure 3. Toothpaste within the sachet 50 is sealed from the atmosphere, is not contaminated by germs and does not dry out.

Referring to Figure 8, in use, the cap 36 is pressed laterally relative to the brush head 12 from the inoperative position shown in Figure 7 to an operative position shown in Figure 8. During the lateral movement, the spikes 54 perforate the membrane of the sachet 50 and toothpaste (shown by stippling) is forced through the aperture 34 and onto the bristles 24. Again, as with the toothbrush shown in Figure 4, the cap 36 is then locked in place by the projection 48. In this embodiment the blocks 52 substantially fill the cavity 28 in the base 22, to ensure that as much toothpaste as possible is forced from the cavity 38 in the cap 36 onto the bristles 24. It will be noted

that the flexible cap 36 is deformed over the spikes 54 to ensure that as much toothpaste as possible is forced onto the bristles 24.

A sachet can be used in the toothbrush shown in Figure 1; and a cap with a sealed membrane could be used with the toothbrush shown in Figure 2.

The toothbrush according to the invention provides a compact and easy to operate toothbrush head which includes a toothpaste dispenser that a traveller can use once, and then throw away. In addition, the system is hygienic and the toothpaste does not dry out as it is sealed from the atmosphere during transport and storage, before use.

Another important advantage of the toothbrush according to the invention is that it can be used in health care to treat, or to assist in the treatment of, oral diseases.

The toothpaste in the cap or sachet may contain an active ingredient such as an antiseptic, antibiotic, antimicrobial, anti-fungal, analgesic, anaesthetic, anti-inflammatory or any other medicament for the treatment of an oral disease, such as a gum disease for example, gingivitis and other oral diseases such as periodontitis, caries, calculus and dentinal hypersensitivity. A typical example would be the toothpaste sold under the trade mark Sensodyne which contains strontium chloride hexahydrate, a surface anaesthetic for treatment of dentinal hypersensitivity.

The advantage of the toothbrush according to the invention is that toothpaste containing an active ingredient is sealed from the atmosphere and this prolongs the shelf-life of the active ingredient in the toothpaste which could otherwise be oxidised if exposed to oxygen. After being used once, the toothbrush is discarded. This is often necessary in treating oral diseases, as a used brush can re-infect a patient or introduce new bacteria to the patient's

mouth. Also, the toothpaste supply in the brush can have a selected volume and concentration of active ingredient for the disease that is to be treated.

The mouthwash in the handle of the brush may also contain an active ingredient as mentioned above for the treatment of an oral disease, such as those mentioned above. For example, the handle could contain the mouthwash sold under the trade mark Cosordyl which contains chlorhexidine gluconate as an active ingredient which is an antibacterial.

CLAIMS

1. A toothbrush comprising:

   a longitudinally extending brush head attached, or attachable, to a brush handle;
   a plurality of bristles extending from the brush head;
   a supply cavity for containing a supply of toothpaste in the brush head;
   at least one aperture extending through the brush head, bringing the supply cavity into communication with the bristles; and
   plunger means movable laterally relative to the brush head from a first inoperative position to a second operative position wherein toothpaste is forced from the supply cavity, via the at least one aperture in the brush head, to the bristles.

2. A toothbrush according to claim 1 wherein the supply of toothpaste is contained within a sealed cartridge within the brush head.

3. A toothbrush according to claim 2 wherein the sealed cartridge includes a perforatable membrane.

4. A toothbrush according to claim 3 wherein the cartridge is a sachet made from a plastics film or a foil.

5. A toothbrush comprising:

   a longitudinally extending brush head attached, or attachable, to a brush handle;
   a plurality of bristles extending from the brush head;

a supply cavity for containing a supply of toothpaste in the brush head;

a membrane for sealing the supply of toothpaste from the atmosphere; and

at least one aperture extending through the brush head, bringing the supply cavity into communication with the bristles.

6. A toothbrush according to claim 5 including plunger means movable from a first inoperative position to a second operative position wherein the membrane is broken and toothpaste is forced from the supply cavity, via the at least one aperture in the brush head, to the bristles.

7. A toothbrush according to claim 5 or 6 wherein the toothpaste is contained in a sachet made from a plastics film or a foil, contained within the supply cavity.

8. A toothbrush according to claim 1 or 6 wherein the plunger means is a cap, the cap having a cavity and an opening thereto, wherein the cavity in the cap defines the supply cavity.

9. A toothbrush according to claim 8 wherein the supply of toothpaste is contained within a sachet made from a plastics film or foil within the supply cavity in the cap.

10. A toothbrush according to claim 8 wherein the supply of toothpaste is contained within the supply cavity in the cap and the opening to the cavity is sealed with a membrane.

11. A toothbrush according to claim 10 wherein the membrane is a plastics film or a foil.

12. A toothbrush according to claim 11 wherein the brush head includes perforating means, for perforating the membrane when the plunger is moved from the inoperative position to the operative position.

13. A toothbrush according to claim 12 wherein the perforating means is a pointed ridge or spike formed integrally with the brush head.

14. A toothbrush according to any one of claims 8 to 11 wherein the cap is made from a flexible plastics material.

15 A toothbrush according to any one of the preceding claims wherein the brush head includes locking means for locking the plunger in the second operative position.

16. A toothbrush according to any one of the preceding claims wherein the brush handle includes a cavity for storing a supply of dental floss.

17. A toothbrush according to any one of the preceding claims wherein the toothpaste includes an active ingredient for treating an oral disease.

18. A toothbrush according to any one of the preceding claims wherein the brush handle includes a cavity for storing a supply of mouthwash.

19. A toothbrush according to claim 18 wherein the mouthwash includes an active ingredient for treating an oral disease.

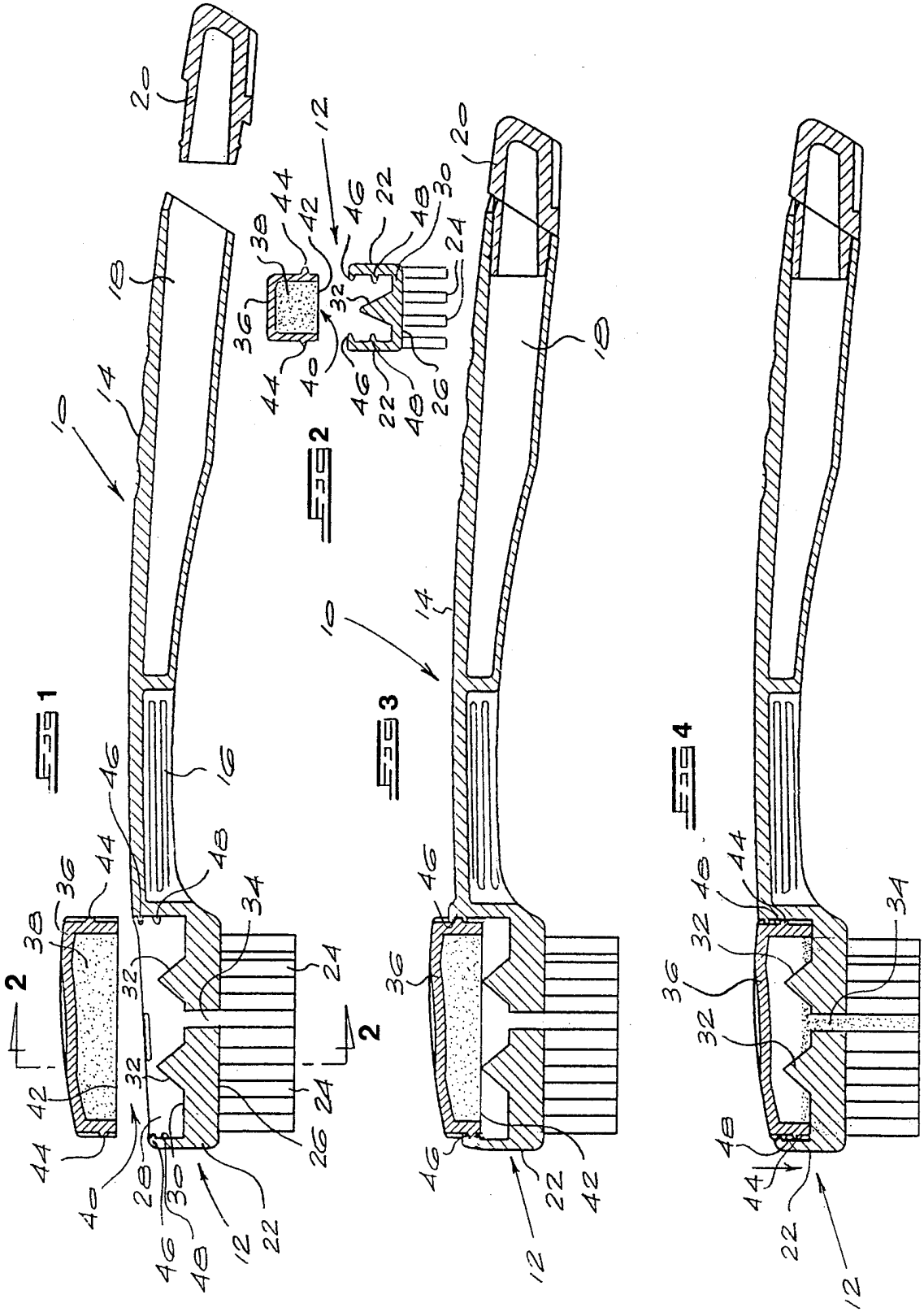


FIG 1
FIG 2
FIG 3
FIG 4
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48

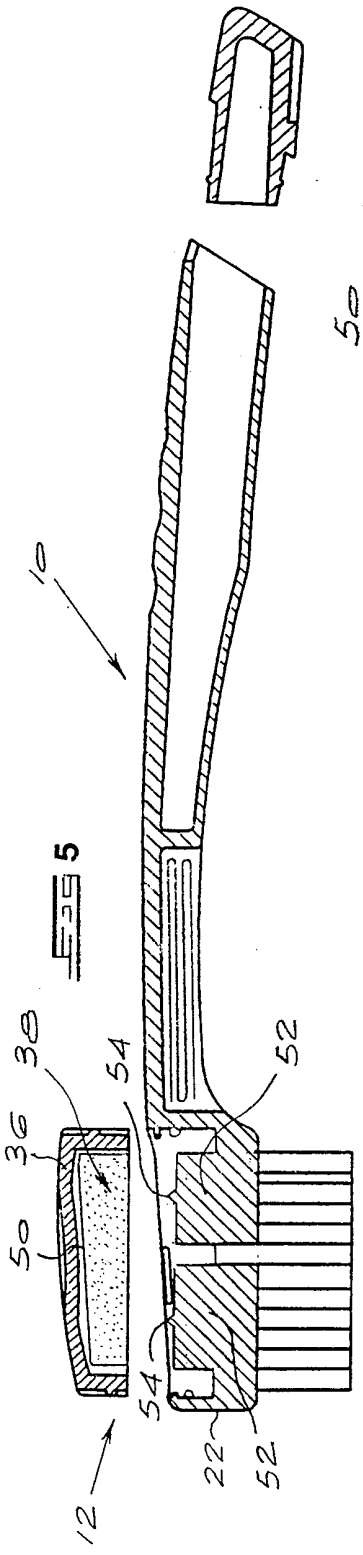


Fig 5

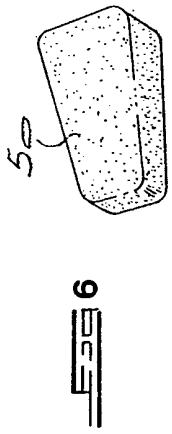


Fig 6

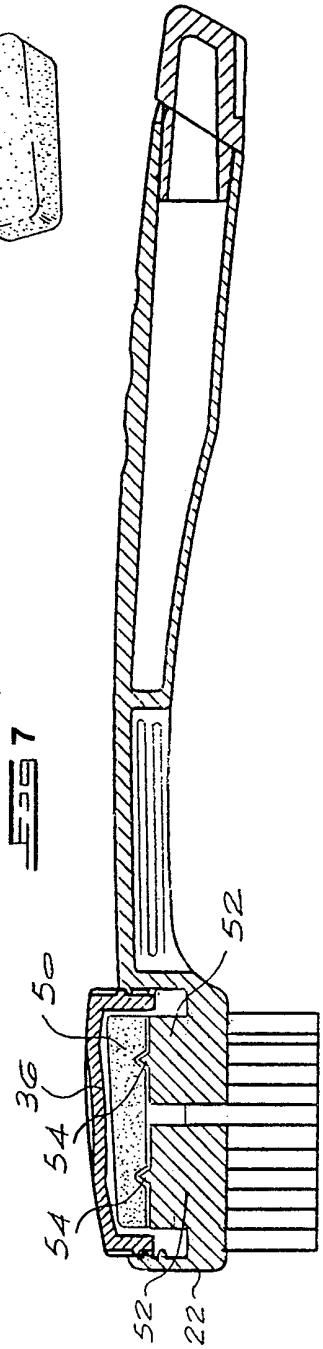


Fig 7

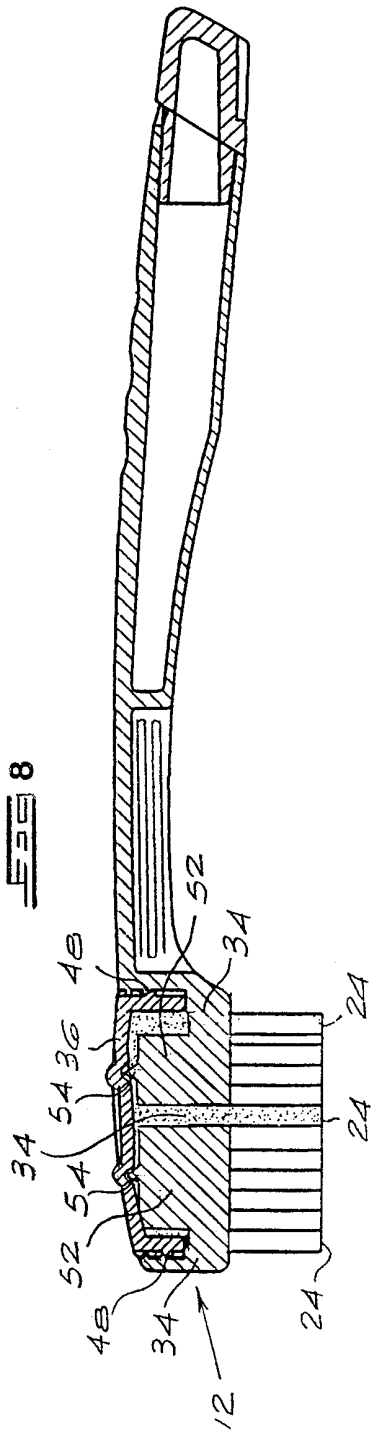


Fig 8

INTERNATIONAL SEARCH REPORT

Int. ional Application No
PCT/IB 99/01875

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A46B11/00

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 7 A46B

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

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

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 5 865 195 A (CARTER THERESA) 2 February 1999 (1999-02-02) column 3, line 58 -column 5, line 20; figures	1,16-19 2-7
X Y	GB 2 231 256 A (LINDSAY) 14 November 1990 (1990-11-14) the whole document	1,17 2-7
X A	FR 2 583 625 A (BARRY CHRISTIAN) 26 December 1986 (1986-12-26) page 2, line 37 -page 4, line 1; figures	1,16,17 2-15
X A	US 5 490 530 A (SNOWDEN PATRICIA) 13 February 1996 (1996-02-13) column 3, line 33 -column 4, line 63; figures	1,17 2-15

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
25 February 2000	06/03/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Triantaphillou, P

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int ional Application No
PCT/IB 99/01875

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5865195 A	02-02-1999	NONE	
GB 2231256 A	14-11-1990	NONE	
FR 2583625 A	26-12-1986	NONE	
US 5490530 A	13-02-1996	NONE	