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(71) Applicant and

(72) Inventor: SARGENT, Bruce, Alan [ZA/ZA]; 17 Arnheim Street, Hazelpark, 1401 Germiston (ZA).

(74) Agents: COCHRANE, David, Hylton et al.; Spoor and Fisher, P.O. Box 41312, 2024 Craighall (ZA).

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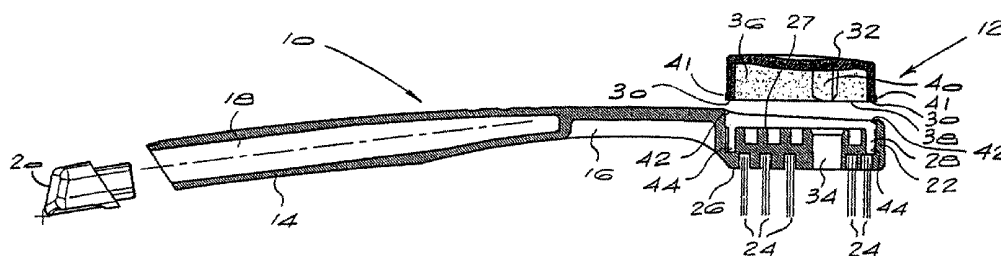
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(54) Title: A DISPOSABLE TOOTHBRUSH



(57) Abstract: This invention relates to a toothbrush and toothpaste dispenser unit. The toothbrush includes a longitudinally extending brush head attached to a brush handle, the brush head defining a first surface and an opposed second surface. A plurality of bristles extending from the first surface on the brush head. The toothbrush also includes a supply cavity, which is defined by a cap, for containing a supply of toothpaste and which is arranged to abut with the second surface on the brush head, the cap being movable from a first inoperative position, laterally relative to the brush head, to a second operative position. At least one aperture extends through the brush head, from the first surface to the second surface, for bringing the supply cavity in the cap into communication with the bristles. A membrane which is arranged to seal the supply cavity in the cap from the aperture is also provided and the cap includes perforating means in the form of a spike for perforating the membrane when it is moved in to the second operative position.



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## A DISPOSABLE TOOTHBRUSH

### BACKGROUND OF THE INVENTION

THIS invention relates to a toothbrush, more particularly to improvements to the disposable toothbrush described in pending International Patent application no. PCT/IB99/01875.

PCT/IB99/01875 discloses a disposable toothbrush including a longitudinally extending brush head attached, or attachable, to a brush handle; a plurality of bristles extending from the brush head; a supply cavity, which is defined by a cap, for containing a supply of toothpaste; a membrane in the form of a plastics film or a foil for sealing the supply of toothpaste within the cap from the atmosphere; and at least one aperture extending through the brush head, to bring the supply cavity into communication with the bristles; wherein the cap is movable from a first inoperative position to a second operative position wherein the membrane is broken and toothpaste is forced from the supply cavity in the cap, via the at least one aperture in the brush head, to the bristles.

The brush head includes perforating means in the form of a pointed ridge or spike formed integrally with the brush head, for perforating the membrane when the plunger is moved from the inoperative position to the operative position.

It is an object of this invention to provide an improved disposable toothbrush

## SUMMARY OF THE INVENTION

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

a longitudinally extending brush head attached to a brush handle, the brush head defining a first surface and an opposed second surface;

a plurality of bristles extending from the first surface on the brush head;

a supply cavity, which is defined by a cap, for containing a supply of toothpaste and which is arranged to abut with the second surface on the brush head, the cap being movable from a first inoperative position, laterally relative to the brush head, to a second operative position;

at least one aperture extending through the brush head, from the first surface to the second surface, for bringing the supply cavity in the cap into communication with the bristles; and

a membrane which is arranged to seal the supply cavity in the cap from the aperture;

characterized in that the cap includes perforating means for perforating the membrane when it is moved in to the second operative position.

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

Advantageously, the perforating means is a spike which is arranged to enter the at least one aperture in the brush head, when the cap is moved from the first inoperative position to the second operative position.

The membrane may be adhered to the first surface, to close the aperture.

Alternatively, the membrane may be adhered to the cap so that the supply of toothpaste within the cap is sealed from the atmosphere.

### **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 top perspective view of the cap on the toothbrush illustrated in Figure 1;

**Figure 3** is a bottom perspective view of the cap on the toothbrush illustrated in Figure 1;

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

**Figure 5** is a cross-sectional side view of the disposable toothbrush of Figure 1 in an operative position; and

**Figure 6** is a pictorial view of a disposable toothbrush according to a second embodiment of the invention.

### **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 removable end cap 20 is provided for closing the second cavity 18.

The brush head 12 includes a base 22 formed integrally with the handle 14. The base 22 defines a first surface 26 to which is secured a number of bristles 24 and a second surface 27, which is opposed to the first surface 26. The bristles 24 are arranged to lie substantially perpendicular relative to the surface 26. The base 22 also defines a receiving slot 28, at the first surface 27, which is arranged to receive the peripheral edge 30 of a cap 32, to bring the cap 32 into abutment with the first surface 27.

Referring to Figures 1, 2 and 3, the cap 32 which is made from a rigid plastics material such as polypropylene or styrene, defines a supply cavity 36 which is surrounded by the peripheral opening 30. The supply cavity 36 in the cap 32 is sealed closed by a perforatable membrane 38 which is made from a plastics film or foil and which is adhered to the peripheral edge 30. The cap 32 also includes perforating means in the form of a plastic spike 40 which is formed integrally with the cap 32, within the cap 32. A single supply of toothpaste (shown by stippling) is contained within the supply cavity 36, behind the membrane 38. The cap 36 further includes a peripheral projection 41 around the peripheral edge 30 which is engageable with first and second projections 42 and 44 within the receiving slot 28.

An aperture 34 extends from the first surface 26 to the second surface 27, through the base 22, and is arranged to bring to the supply cavity 36 in the cap 32 into communication with the bristles 24.

Referring to Figure 4, the cap 32 is pressed onto the base 22 so that the projection 40 on the cap 32 engages with the first projection 42 in the receiving slot 28 in the base 22, thereby locking the cap 32 onto the base 22. The cap 32 is now in a first inoperative position, with the toothbrush 10 ready for sale or storage. The membrane 38 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 5, in use, the cap 32 is pressed, like a plunger, from the first inoperative position shown in Figure 4, laterally relative to the brush head 12, to the second operative position shown in Figure 5. During the lateral movement, the spike 40 breaks the membrane 38 and enters the aperture 34. Toothpaste (shown by stippling) is forced through the aperture 34 around the spike 40 and onto the bristles 24. The peripheral projection 40 engages sealingly with the receiving slot 28 to stop toothpaste from escaping between the cap 32 and the slot 28. Once in the second operative position, the peripheral projection 40 on the cap 32 engages with the second projection 44 in the slot 28, locking the cap 32 in place, so that the toothbrush may only be used once. The toothbrush may then be used by a user, with toothpaste already on the bristles. After brushing, the user may use the mouthwash from the cavity 16 to wash his/her mouth out and then may use the dental floss from the cavity 18 for further cleaning of the teeth. Thereafter the toothbrush 10 is discarded.

Referring to Figure 6, according to a second embodiment of the invention, instead of having a membrane adhered to the cap, of the disposable toothbrush 10, a membrane 46 is adhered to the second surface 27 on the brush head 22, so that it covers the aperture 34 in the brush head 22. A cap as described above (but not shown in Figure 6) containing a supply of toothpaste, but not having a membrane to seal it, is placed onto the brush head 22. The tooth brush 10 is then ready for sale or storage, with the membrane 46 sealing the supply cavity in the cap from the aperture 34. In use, when the cap is pushed down onto the brush head, the spike in the cap breaks the membrane 46 and toothpaste from the supply cavity in the cap is forced through the aperture 34, around the spike and onto the bristles 24. The tooth brush 10 may then be used. Although there will be some degree of sealing between the edge of the cap and the membrane 46, it is envisaged that this brush will be supplied in a sealed packet to keep the tooth paste from drying out or being contaminated by germs.

**CLAIMS**

1. A toothbrush including:

a longitudinally extending brush head attached to a brush handle, the brush head defining a first surface and an opposed second surface;

a plurality of bristles extending from the first surface on the brush head;

a supply cavity, which is defined by a cap, for containing a supply of toothpaste and which is arranged to abut with the second surface on the brush head, the cap being movable from a first inoperative position, laterally relative to the brush head, to a second operative position;

at least one aperture extending through the brush head, from the first surface to the second surface, for bringing the supply cavity in the cap into communication with the bristles; and

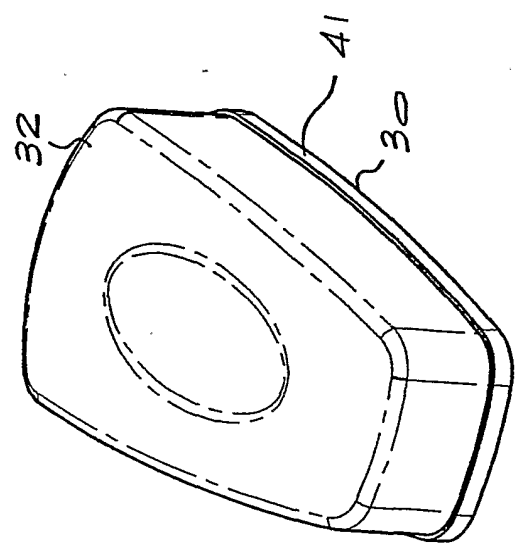
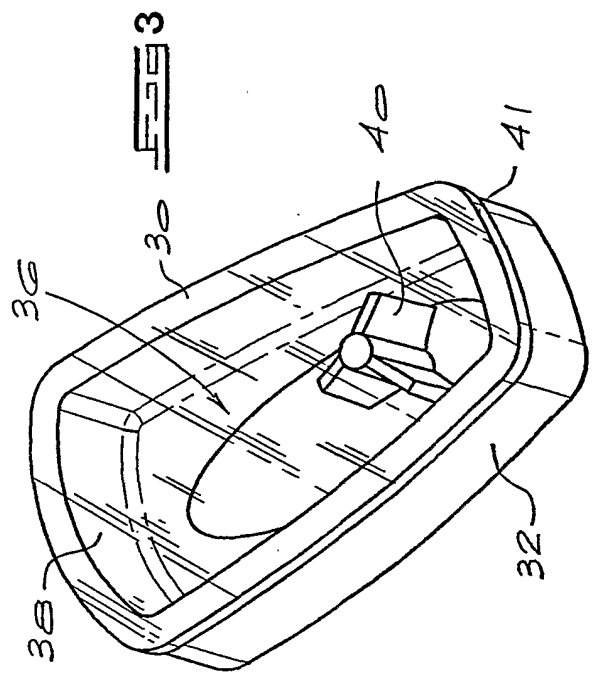
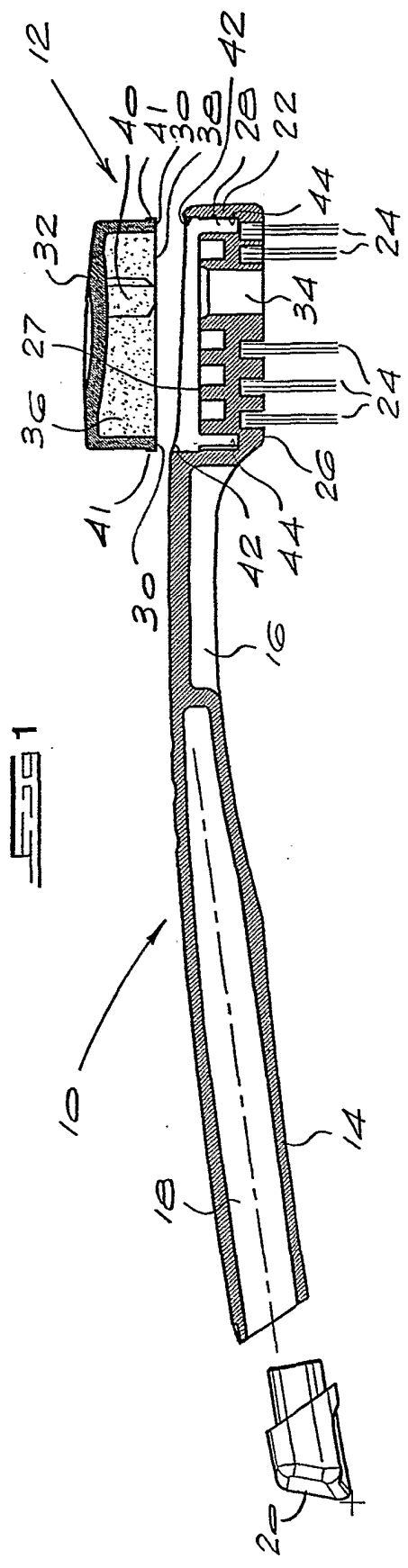
a membrane which is arranged to seal the supply cavity in the cap from the aperture;

characterized in that the cap includes perforating means for perforating the membrane when it is moved in to the second operative position.

2. A toothbrush according to claim 1, wherein the perforating means is a pointed ridge or spike formed integrally with the cap.
3. A toothbrush according to claim 2, wherein the perforating means is a spike which is arranged to enter the at least one aperture in the brush head, when the cap is moved from the first inoperative position to the second operative position.
4. A toothbrush according to any one of the preceding claims wherein the membrane is adhered to the first surface, to close the aperture.

5. A toothbrush according to any one of the claims 1-4, wherein the membrane is adhered to the cap so that the supply of toothpaste within the cap is sealed from the atmosphere.





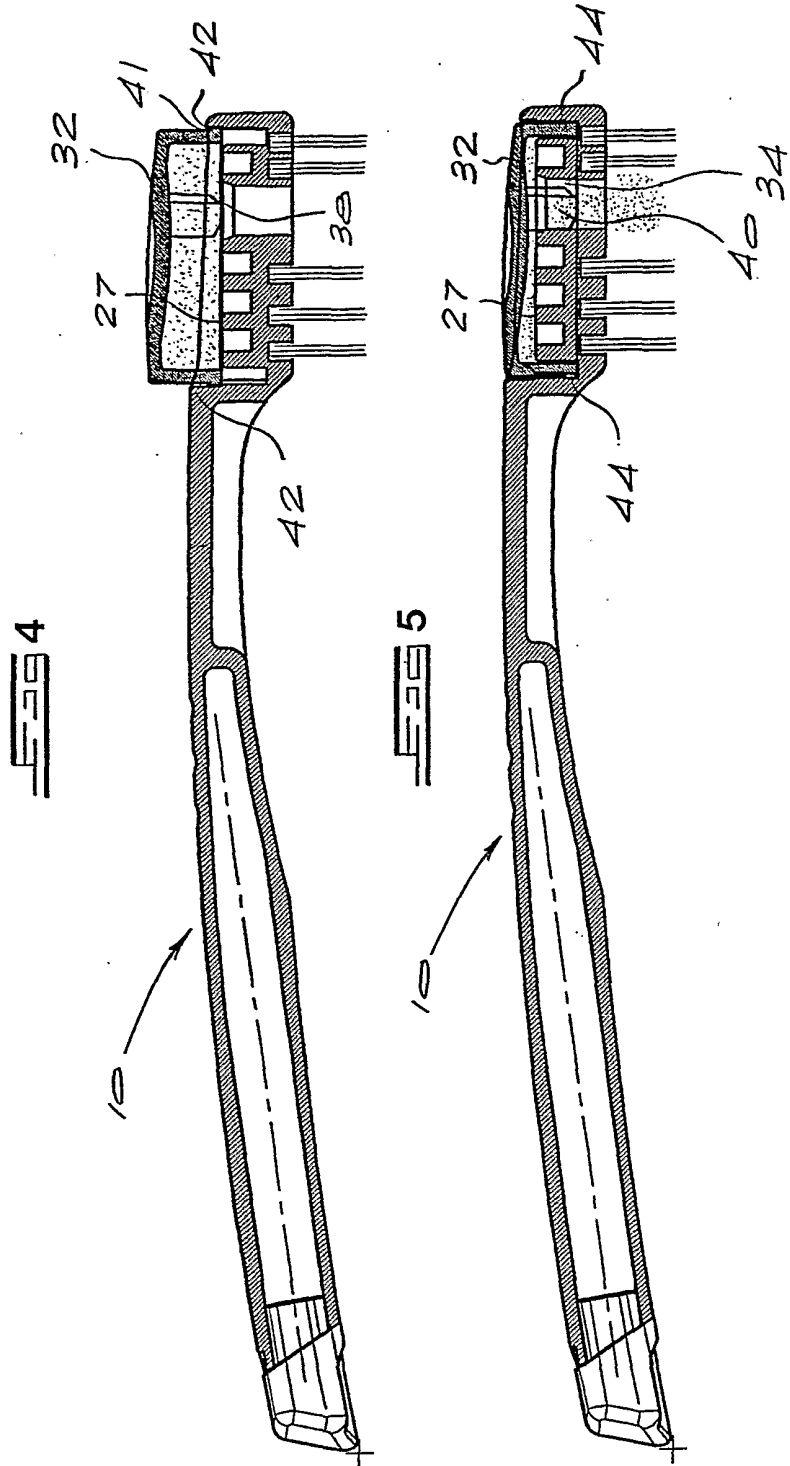
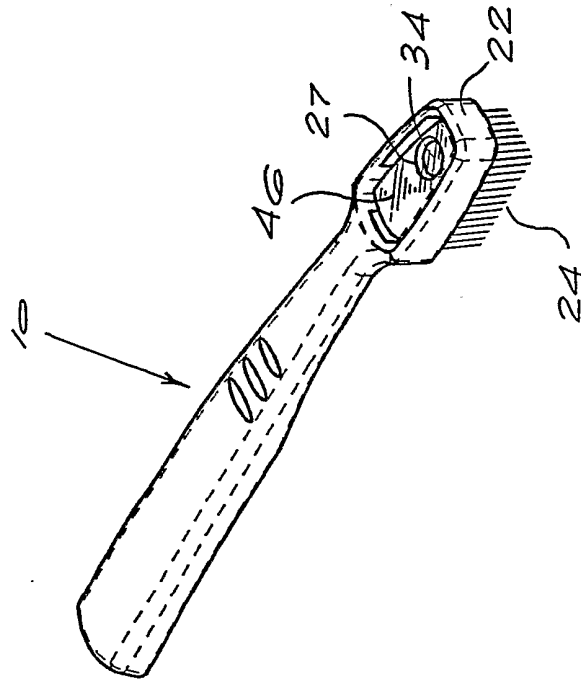


FIG 6



## INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 01/00986

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 A46B11/00 A46B15/00

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)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 00 53053 A (SARGENT BRUCE ALAN ; TRI CONCEPTS PROPRIETARY LIMIT (ZA)) 14 September 2000 (2000-09-14) the whole document	1,2,4,5
X	US 5 181 531 A (ESCOTO DARIO ET AL) 26 January 1993 (1993-01-26) the whole document	1-3
X	FR 2 629 989 A (CAMARA NABY) 20 October 1989 (1989-10-20) the whole document	1,2,4,5
Y	FR 1 161 639 A (GOEURY) 2 September 1958 (1958-09-02) the whole document	1-5
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Name and mailing address of the ISA

European Patent Office, P.B. 5618 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

Triantaphillou, P

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Int'l Application No  
PCT/IB 01/00986

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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