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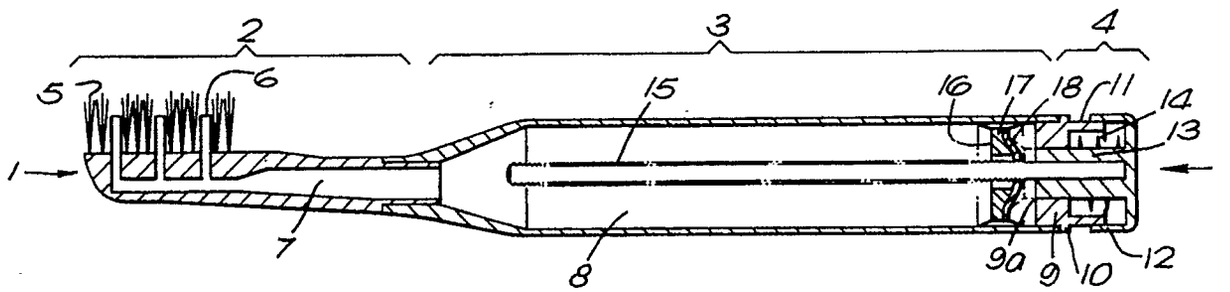
(54) Toothbrush with toothpaste dispenser.

(57) A toothbrush (1) is described which has a toothbrush head (2) and a toothpaste dispenser (3) for dispensing toothpaste from a cavity (8) to the toothbrush head (2). The toothpaste dispenser (3) has a ridged component (15) arranged lengthwise of the cavity (8) and a dispensing component (16) which acts with the ridged component (15). The dispensing component (16) forms an internal sealing surface to retain toothpaste within the cavity (8) and is movable along the cavity (8) to dispense toothpaste.

FIG. 1



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TOOTHBRUSH WITH TOOTHPASTE DISPENSER

This invention relates to a toothbrush with a toothpaste dispenser.

There have been proposed toothbrushes which have toothpaste dispensers incorporated into the handle of the toothbrush. However, these have often included complicated valve arrangements for ensuring that the amount of toothpaste dispensed is controlled. In GB 1470269 a toothbrush with a toothpaste dispenser is described. The toothbrush has a hollow handle into which a cartridge containing toothpaste may be inserted. To dispense toothpaste to the head of the toothbrush the cartridge is depressed axially into the handle. On being depressed, toothpaste is forced from the cartridge through a piston passage to a capillary tube and thence to the head of the toothbrush. A spring provided in the handle, which abuts the face of the cartridge, forces the cartridge back to its original position once the cartridge is released. Apart from its complexity, GB-1470269 does not provide means which ensures that all the toothpaste contained in the cartridge will be dispensed. It is also necessary for the whole cartridge to move relative to the handle when depressed.

It is desirable to provide a toothbrush having a toothpaste dispenser which enables control of dispensing of the toothpaste in a simple and effective manner.

The present invention provides a toothbrush having a toothbrush head and toothpaste dispensing means for dispensing toothpaste from a toothpaste cavity to the toothbrush head, the dispensing means comprising: a ridged component arranged lengthwise of the cavity; a dispensing component which acts with the ridged component and with means providing an internal sealing surface to retain toothpaste within the cavity and which is movable along the cavity to dispense toothpaste therefrom, the dispensing component cooperating with said ridged component (a) to securely engage said ridged component when it is urged in a first direction so that the dispensing component moves with said ridged component relative to the sealing surface to dispense toothpaste from the cavity and (b) to release the ridged component for movement in the opposite direction, whereby the dispensing component remains in its displaced position.

Preferably the ridged component is an elongate ridged post or rod extending axially of the cavity and said means providing an internal sealing surface is the wall of said cavity. The post is preferably ridged to provide a continuous screwthread.

The dispensing component preferably comprises a relatively rigid portion which sealingly engages with the sealing surface to form a false floor within the cavity, the resilient element being secured centrally of said rigid portion to cooperate with the ridged post. In the preferred embodiment the resilient element has several circumferentially spaced inwardly projecting fingers of resilient material.

Preferably the dispensing means further comprises a button connected to the ridged post such that on depression of the button, the ridged post is caused to move in said first direction. On movement of the ridged post in said first direction, these fingers bear against a particular ridge on the ridged post to engage it secure that the rigid portion moves with the ridged post in said first direction relative to the cavity and on movement of the ridged post in said opposite direction these fingers spring away from the ridges on said ridged post so as to allow it to move in said opposite direction, while the dispensing component remains in its displaced position relative to the cavity.

For a better understanding of the present invention and to show how the same may be carried into effect, reference will now be made by way of example to the accompanying drawings, in which:

Figure 1 is a vertical cross-sectional view along the axis of a toothbrush;

Figure 2 is a cross-sectional view of the rigid portion of the dispensing component;

Figure 3 is a cross-sectional view of the resilient element of the dispensing component; and

Figures 4a and 4b are plan views of two different embodiments of the resilient element.

With reference to Figure 1, a toothbrush 1 has three sections: a head section 2, a middle section 3 and an end cap 4. The head section 2 has a flat upper surface to which bristles 5 are attached to form a brush. Dispensing tubes 6 are also provided in the head section 2, the ends of the dispensing tubes 6 projecting beyond the upper surface of the head section 2 among the bristles 5 to provide toothpaste thereto. There are three dispensing tubes shown in Figure 1 but any number of dispensing tubes may be incorporated in the head section 2. Within the head section 2 the dispensing tubes 6 are in fluid communication with a common conduit 7.

The middle section 3 is fixedly attached at one end to the head section 2 and has an inner elongate cavity 8 for holding toothpaste or some other form of dentifrice paste. The cavity 8 is fluidly connected to the conduit 7 in the head section 2 which is in turn fluidly connected to the toothpaste dispensing tubes 6. The end of the middle section 3 remote from the head section 2 is closed with an

annular holding member having a central opening 9a. The outer surface of the holding member 9 tightly engages the inner wall of the cavity 8 at the end of the middle section 3. A peripheral ridge 10 on the outer surface of the holding member 9 abuts against the end of the cavity 8 so that axial movement of the holding member 9 is prevented. The holding member 9 extends into an annular projection 11 which projects away from the edge of the middle section 3 for engagement with the end cap 4.

The end cap 4 is in the form of a button having a peripherally depending rim 12 which snugly but slideably engages the outer wall of the annular projection 11 of the holding member 9. The cap 4 also has a central stalk 13 which projects into the central opening of the annular holding member 9. The central stalk 13 fits snugly into the central opening 9a of the holding member 9 but is capable of movement axially through that central opening. A spring 14 is situated around the central stalk 13 and is in compression between the holding member 9 and the inner surface of the cap 4.

A ridged elongate component in the form of a rigid axially extending post 15 is attached at one end to the central stalk 13 of the cap 4. The central stalk 13 is hollowed to receive one end of this post 15. The end of the post 15 opposite to the end attached to the central stalk 13 is free and lies within the cavity 8. The post 15 is screwthreaded to provide a circumferentially extending ridge.

Within the cavity 8 there is a dispensing component designated generally by numeral 16 and which acts as a "false floor". The dispensing component 16 comprises a spindle valve having a rigid portion 17 and a holding component 18 in the form of a resilient element. As seen in Figures 1 and 2 the rigid portion 17 has an external circumferentially disposed surface 19 which sealingly engages the inner wall of the cavity 8 to prevent toothpaste exiting between the external surface 19 and the wall of the cavity 8.

The resilient element 18 is attached to the rigid portion 17 and is disposed on the face of the rigid portion 17 facing the holding member 9. The resilient element 18 is made of resilient material and as may be seen in the embodiment of both Figures 4a and 4b has four circumferentially spaced inwardly projecting fingers 20. Although both Figures 4a and 4b show four fingers any number of fingers may be used as long as the fingers are sufficiently resilient to allow the ridged post to move relative to the dispensing component 16 in one direction axially without causing axial movement of the dispensing component, as described hereinafter.

The resilient element is arranged as can be seen in Figure 3 (exaggerated for clarity) so that the fingers 20 bear against a particular ridge on the post 15 thereby to securely engage the post and prevent axial movement of the post 15 relative to the dispensing component. Hence movement of the post 15 in a first axial direction (towards the left in Figure 1) causes the dispensing component 16 to move with the post 15 axially along the cavity. However, the post 15 is able to move in the opposite axial direction relative to the dispensing component without causing movement of the dispensing component 16 relative to the cavity 8 as the fingers 20 spring away from the ridges on the post 15.

In operation, toothpaste is provided in the cavity 8 and fills the cavity 8 as far as the dispensing component 16. There is no toothpaste between the dispensing component 16 and the holding member 9. The cap 4 is depressed and moves towards the holding member 9, compressing the spring 14. Depression of the cap 4 causes the central stalk 13 to move axially into the cavity 8 and to push the post 15 along the cavity 8. At this point the fingers 20 of the element 18 engage the post 15 and so the dispensing component moves along the cavity 8 with the post 15. Movement of the dispensing component 15 urges toothpaste in the cavity 8 out of the cavity 8 into the conduit 7, and hence to the toothbrush head.

On releasing the cap 4, the spring 14 forces the cap 4 back to its original position thus pulling the post 15 back to its original position. The resilient fingers of the resilient element 18 momentarily spring away from the post to allow the ridges to pass through the dispensing component 18 without dislodging it from its displaced position in the cavity 8. In order to obtain sufficient toothpaste from the dispensing tubes 6, the cap 4 can be repeatedly depressed and released. In the process the dispensing component 16 advances along the cavity 8 so forcing toothpaste through the cavity 8 to the dispensing tubes 6 via the conduit 7. Each time the cap 4 is released, the dispensing component retains its new position.

Claims

1. A toothbrush having a toothbrush head and toothpaste dispensing means for dispensing toothpaste from a toothpaste cavity to the toothbrush head, the dispensing means comprising: an elongate ridged post arranged lengthwise of the cavity; a dispensing component having a relatively rigid portion which sealingly engages the wall of the cavity to retain toothpaste within the cavity, and a resilient element which comprises a plurality of circumferentially spaced inwardly projecting fingers which act to engage ridges on the ridged post so that the dispensing component is movable along

the cavity to dispense toothpaste therefrom, the fingers cooperating with said ridged post (a) to securely engage a ridge of said ridged post when it is urged in a first direction so that the dispensing component moves with said ridged post relative to the wall of the cavity to dispense toothpaste from the cavity and (b) to release that ridge for movement in the opposite direction, whereby the dispensing component remains in its displaced position.

2. A toothbrush as claimed in claim 1, wherein the resilient element comprises four inwardly projecting fingers.

3. A toothbrush as claimed in any one of the preceding claims, wherein the toothbrush head has an internal conduit providing fluid communication from the toothpaste cavity to bristles on the toothbrush head.

4. A toothbrush as claimed in claim 3, wherein there is further provided supply means among the bristles on the toothbrush head, the supply means being in fluid communication with the conduit so that toothpaste from the toothpaste cavity may be dispensed to upper portions of the bristles.

5. A toothbrush as claimed in any one of the preceding claims, wherein said dispensing means comprises a button connected to said ridged post such that on depression of said button said ridged post is caused to move in said first direction.

6. A toothbrush as claimed in claim 5, wherein said dispensing means further comprises biasing means such that on release of said button after depression said button returns to its original position under the action of said biasing means and hence said ridged post is caused to move in said opposite direction.

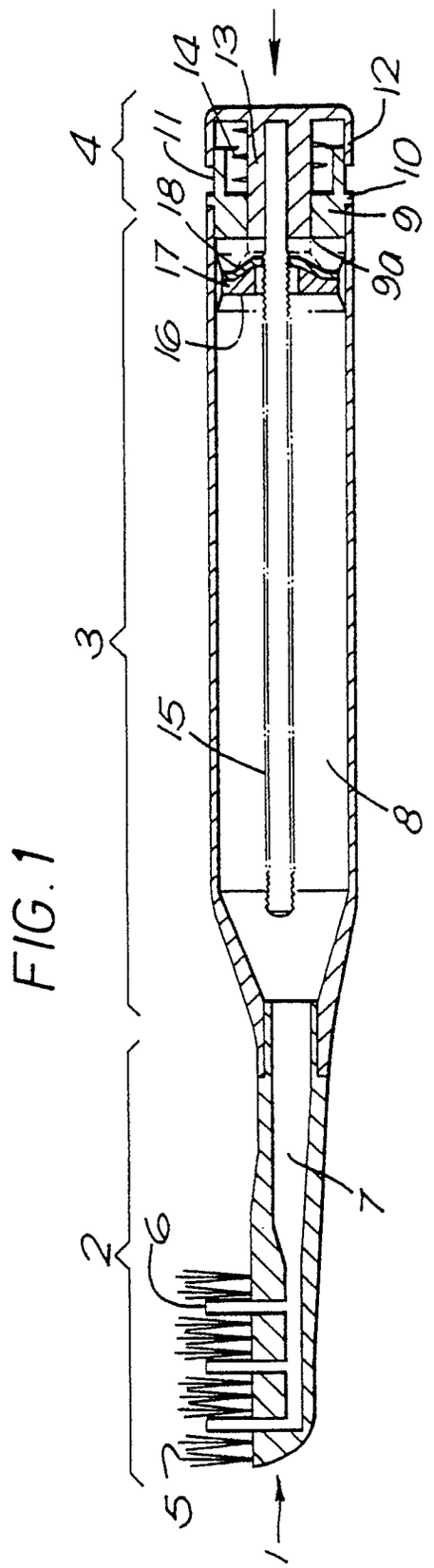

FIG. 1

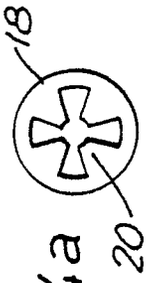

FIG. 4a

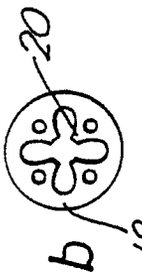

FIG. 4b

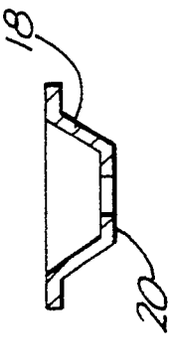

FIG. 3

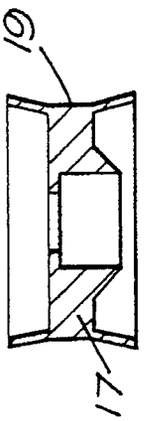

FIG. 2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 30 7854

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	GB-A-264733 (LORD) * page 1, line 92 - page 2, line 107; figures 1-4 *	1, 5, 6	A46B11/02
X	FR-A-2597734 (LELIEVRE) * claims 1-4; figures 1-5 *	1, 5, 6	
Y		3, 4	
Y	US-A-3227165 (COSTANZA) * column 2, lines 5 - 12; figures 2-4 *	3, 4	
A	US-A-1921912 (PHILIPPS) * page 1, line 58 - page 2, line 81; figures 1-6 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A46B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	29 OCTOBER 1990	ERNST R.T.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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