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DISPENSER FOR FLUIDS

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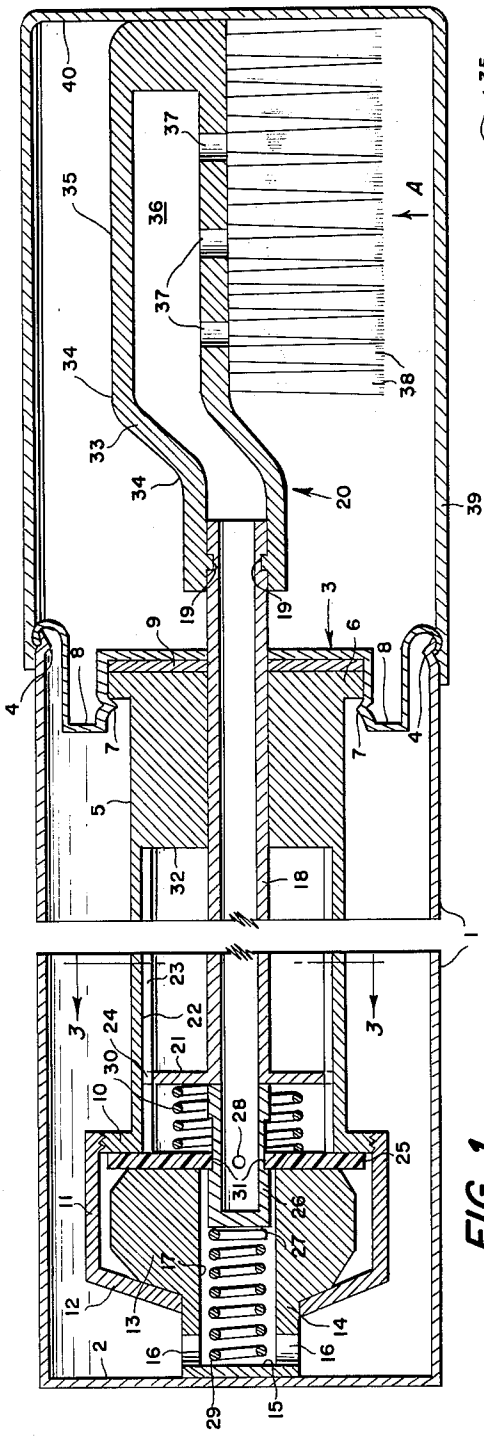


FIG. 1

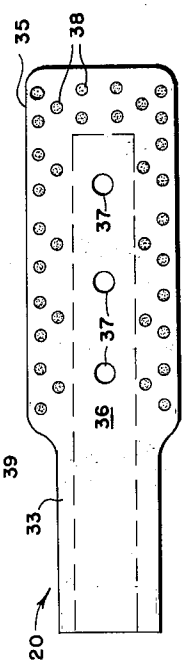


FIG. 2

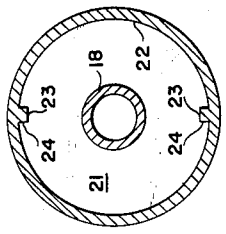


FIG. 3

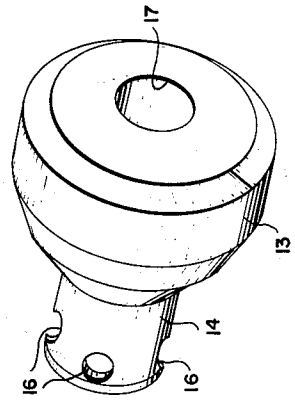


FIG. 4

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DISPENSER FOR FLUIDS

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This invention relates to an improved dispenser for fluids and, more particularly, to such a dispenser for the discharge of toothpaste which incorporates a brushing device for use on the teeth of the user.

It is an object of the present invention to overcome the disadvantages associated with the application of toothpaste from a tube or tin to a brush for the brushing of the teeth since this task is irksome, time-consuming, and is potentially wasteful of the toothpaste.

A dispenser according to the invention comprises a rigid container having an axially slidable tube passing through and in fluid-sealing engagement with one wall of the container, the tube being movable relative to the container from a position in which an orifice or orifices, which serve to communicate the interior of the tube with the interior of the container, are covered by a stationary valve closure member located within the container to a position in which said orifice or orifices are not covered by the valve closure member, and a brushing device being mounted to the end portion of the tube located externally of the container and being formed with a passage or passages which are in communication with the interior of the tube to permit fluid from the interior of the container to be dispensed therefrom.

In the accompanying drawing in which the preferred embodiment of the invention is illustrated:

FIG. 1 is a view in vertical axial section of the dispenser,

FIG. 2 is a view in the direction of the arrow A of FIG. 1 of that portion of the dispenser which constitutes the brushing device,

FIG. 3 is a view taken along 3—3 of FIGURE 1, and

FIG. 4 is a perspective view of element 13 of FIGURE 1.

Referring to the drawings, 1 denotes a rigid cylindrical container which is closed at one end by an end wall 2 integrally formed with the container 1 and at the other end by an end wall 3 of annular form which is secured to the walls of the container 1 by crimping as illustrated at 4 (FIG. 1).

A rigid tube 5 is axially located within the container 1 and is formed at the end portion adjacent to the wall 3 with an annular flange 6 to which the wall 3 is secured by crimping as shown at 7, the wall 3 being formed with an annular depression, denoted by the numeral 8, to facilitate said securement of the tube 5 thereto.

A resiliently deformable gasket 9 of annular form is positioned between the flange 6 and the adjacent face of the end wall 3 to ensure that the joint between the tube 5 and the wall 3 is substantially fluid-tight.

The end portion of the tube 5 remote from the flange 6 presents a second annular flange 10, the peripheral surface of which is screw-threaded for engagement with a correspondingly screw-threaded portion of a union nut 11 which is in the form of a cylinder having an inwardly directed abutment shoulder 12 of substantially annular form disposed at one end thereof.

A flange portion 13 presented by a valve seating member 14 of substantially cylindrical form is located within the nut 11, and is restrained therein by the shoulder 12, the end face 15 of said member 14 remote from the flange portion 13 being in abutting engagement with the end wall 2 of the container 1. Passages 16 are formed in the member 14 to permit toothpaste from the interior of

the container 1 to enter the centrally disposed bore 17 in the member 14.

Slidably located within the tube 5 is a further rigid tube 18, which is the tube referred to in the third paragraph of this specification, one end portion of the tube 18 protruding through the end wall 3 and being formed with means 19 for attachment thereto of a brushing device 20 which is hereinafter described in detail. The end of the tube 18 remote from the brushing device 20 is formed with an annular flange 21. The internal diameter of that portion 22 of the tube 5 through which the flange 21 travels during sliding movement of the tube 18 within the tube 5 is such that the flange 21 is a clearance fit therein and axially disposed spines 23 are presented by the internal surface of the portion 22, the spines 23 being located within corresponding notches 24 formed in the periphery of the flange 21 thereby operatively to guide the tube 18 and to prevent rotation thereof relative to the tube 5.

An annular partition valve closure member 25 is located between the adjacent faces of the flange 13 of the valve seating member 14 and of the flange 10 of the tube 5, a cylindrical tube 26 being slidably located within the bore in the member 25. The end of the tube 26 adjacent to the end wall 2 is closed by an end wall 27 and an orifice or orifices 28 are formed in the cylindrical wall of the tube 26 to permit the passage of toothpaste to the interior of the tube 26 from the interior of the container 1 by way of the passages 16 and the bore 17, the outside diameter of the tube 26 and the diameter of the bore 17 being such that toothpaste may pass between said parts.

Compression springs 29, 30 are mounted between the end wall 15 and the end wall 27 and between the valve closure member 25 and the flange 21 presented by the tube 18, respectively. The spring 29 serves to urge the tube 26 into the position in which the annular partition valve closure member 25, covers the orifice or orifices 28 in the tube 26, the valve closure member 25, when the tube 26 is in this position, being seated within an annular notch 31 formed on the external surface of the tube 26 while the spring 30 serves to urge the tube 18 out of the container 1. The extent to which the tube 18 may be ejected from the container 1 is determined by the position of a shoulder 32 presented by the tube 5 and defining the end of the portion 22.

The brushing device 20 comprises a tubular portion 33 formed with a double bend 34 for ease of use, one end portion of said portion 33 being connected to the end portion of the tube 18 located outwith the container 1 by the means 19. The tubular portion 33 presents an integrally formed tooth-brush head 35 at the end thereof remote from the tube 18. The tooth-brush head 35 incorporates a blind bore 36 which is a continuation of the bore in the tubular portion 33. A plurality of holes 37 are formed in the face of the tooth-brush head 35 from which the brushing bristles 38 protrude as in known constructions of toothbrushes, said holes 37 being in communication with the bore 36 in the tooth-brush head 35 so that toothpaste being dispensed is caused to issue from the tooth-brush head 35 into the brushing bristles 38.

A cap 39 comprising a cylindrical portion of substantially the same diameter as the cylindrical container 1 and one end of which is formed with an end wall 40 is adapted to be a press fit on the end portion of the container 1 with which the end plate 3 is associated, the end wall 40, when the cap 39 is so mounted to the container 1, abutting against the brushing device 20 thereby to restrain the tube 18 against possible movement out of the container 1.

In practice, when it is desired to use the dispenser the cap 39 is removed and the tooth-brush head 35 is urged toward the container 1 thereby causing the tube 18 and

the tube 26 to be moved axially against the influence of the springs 29, 30 to the position in which the orifice or orifices 28 are no longer covered by the valve closure member 25. Toothpaste within the container 1, which is under pressure exerted by a propellant incorporated within the container 1, is then caused to pass through the orifice or orifices 28 from the interior of the container 1 by way of the passages 16 and the bore 17. Thereafter the toothpaste passes by way of the tube 26, the tube 18, the tube 33 and the bore 36 and the plurality of holes 37 to the brushing bristles 38.

When the required quantity of toothpaste has been dispensed the force on the tooth-brush head 35 is released so permitting the tube 26 to return under the influence of the spring 29, to the position in which the valve closure member 25 covers the orifice or orifices 28 in the tube 26 thereby preventing further toothpaste from entering the tube 26. Simultaneously the tube 18 is ejected from the container 1 under the influence of the spring 30 thereby causing the toothbrush head 35 to be spaced from the container 1.

The tooth-brush head 35 is then used in the customary manner to clean the teeth of the user.

When the cleaning operation has been completed and it is desired to store the dispenser the toothbrush head 35 is urged against the influence of the spring 30 to the position in which the tube 18 is returned to the original position, in which it is located mainly within the container 1, and the cap 39 is replaced to restrain the axially movable parts in this position.

What is claimed is:

1. An improved fountain toothbrush comprising a rigid container containing dentifrice under pressure, an axially slidable tube through and in fluid-sealing engagement with one wall of said container, a cylindrical casing secured within said container coaxial therewith and spaced radially from the slidable tube whereby a substantially annular reservoir is provided which contains the supply of dentifrice, means entirely within the casing for restraining other than axial movement of the sliding tube, an annular partition clamped within said casing, a spring disposed between said annular partition and the sliding tube, a second sliding tube coaxial with an in abutting relation with the first sliding tube, said second tube positioned slidably within the annular partition part of which is in communication with dentifrice in the rigid container but unconnected therewith except by a peripheral port in the second tube, a spring interposed between the container and the end of said second tube maintaining the second tube in abutting relation with the first mentioned tube and the peripheral port in the tube closed by the partition, in combination with a toothbrush head located externally from the container on the axially slidable tube and formed with a plurality of passages which are in communication with the interior of the tube whereby fluid from the interior of the container may be dispensed when inward movement of the slidable tube against the action of the springs exposes the part of said second tube to communication with the dentifrice containing portion of the container.

2. The improved fountain toothbrush as claimed in claim 1 in which the means for restraining the movement of the slidable tube comprises a flange presenting peripheral surface elements cooperating with surface elements on the inner peripheral walls of the casing.

3. The improved fountain toothbrush as claimed in claim 2 including a cap which is adapted to be press-fit on the end portion of the container, said cap abutting against the brushing device restraining the axially slidable tube in abutting relation with said second tube without substantial movement of the second tube, the peripheral port in said second tube remaining out of communication with said dentifrice supply container.

4. In a fountain toothbrush in which inward movement against the action of springs of a tube slidable within a rigid dentifrice container and carrying a tubular brush head exposes a port by which dentifrice from the container is delivered through the tube to the brush head, in combination with the container the sliding tube and the toothbrush head, a cylindrical casing secured within the container coaxial therewith and with the sliding tube and spaced radially from the latter, means entirely within the casing for restraining other than axial movement of the sliding tube, said means comprising a flange on the tube, said flange presenting peripheral surface elements cooperating with surface elements on the inner peripheral wall of the casing, an annular partition clamped within the casing, a spring disposed between the annular partition and the flange on the sliding tube, a second sliding tube coaxial with and in abutting relation with the first mentioned sliding tube said second tube lying in part in a space in communication with the dentifrice in the container, but unconnected therewith except by a peripheral port in the tube and a spring interposed between the container and the end of the said tube said spring maintaining the second tube in abutting relation with the first mentioned tube and the peripheral port in the tube closed by the partition.

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