Jan. 4, 1966 M. T. COSTANZA 3,227,165

COMBINED DISPENSING TOOTHPASTE HOLDER AND BRUSH

Filed Sept. 11, 1962

FIG. 1

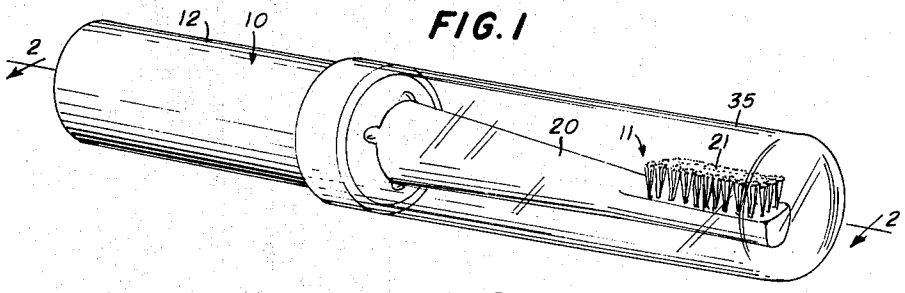
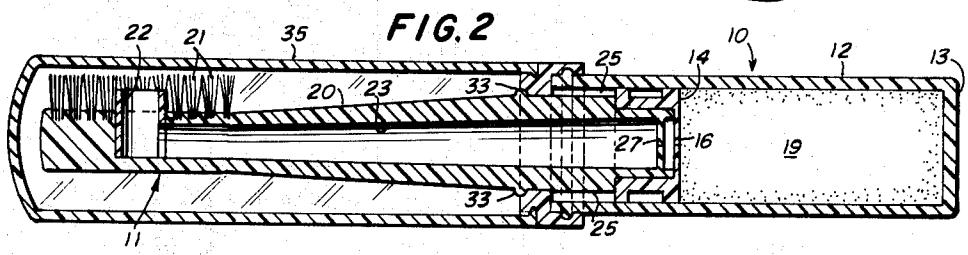


FIG. 2



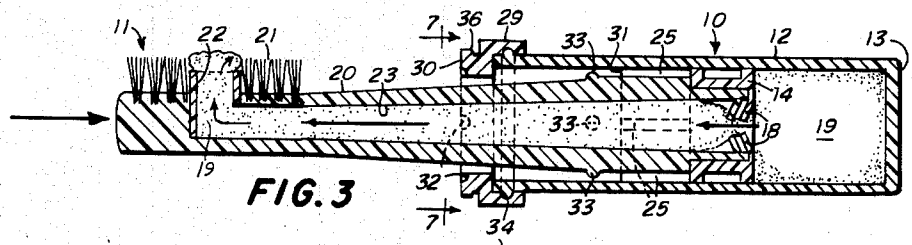


FIG. 3

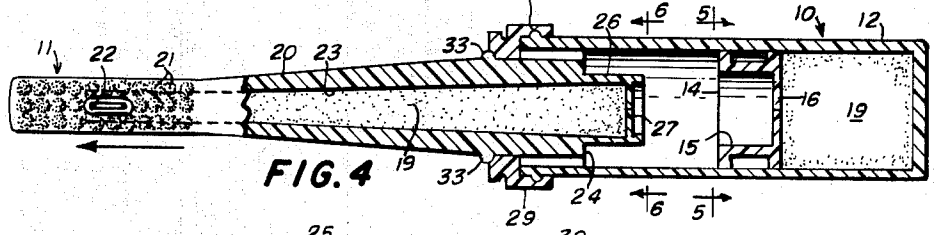


FIG. 4

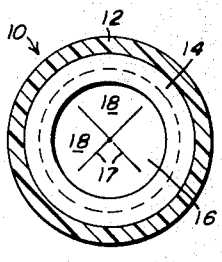


FIG. 5

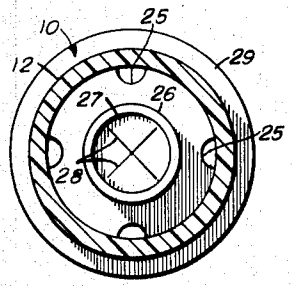


FIG. 6

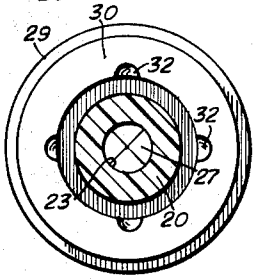


FIG. 7

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COMBINED DISPENSING TOOTHPASTE HOLDER AND BRUSH

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This invention relates to brushes, and more particularly to brushes having a self-contained supply of material capable of being dispensed to the brush.

One object of the invention is to provide a toothbrush having self-contained means for dispensing a dentifrice.

Another object of the invention is to provide a container means of the dispensing type for storing a quantity of a paste-like dentifrice in a manner convenient for use while traveling, as well as in the home.

Still another object of the invention is to provide storage container means for a toothbrush and supply of toothpaste.

A still further object of the invention is to provide a combined traveling case for toothpaste and a toothbrush with means to dispense the paste to the bristles when needed.

Another object of the invention is to provide a prefilled tube, or capsule, of toothpaste capable of attachment to a dispensing-type of toothbrush and which may be discarded when empty.

Other objects and advantages will be apparent to those skilled in the art after reading the following specification in connection with the annexed drawings, in which:

FIG. 1 is a perspective view of a preferred form of combined dentifrice-dispensing container and toothbrush in accordance with this invention;

FIG. 2 is a longitudinal cross-section taken on the line 2—2 of FIG. 1;

FIG. 3 is a cross-section in the same plane as that of FIG. 2, but with the protective cover removed and with the brush portion in position for dispensing the dentifrice;

FIG. 4 is a longitudinal cross-section taken in the plane disposed at right angles to the plane of FIGS. 2 and 3, and with the brush portion in operative position;

FIG. 5 is a transverse cross-section, on an enlarged scale, taken on the line 5—5 of FIG. 4;

FIG. 6 is a transverse cross-section taken on the line 6—6 of FIG. 4; and

FIG. 7 is a transverse cross-section taken on the line 7—7 of FIG. 3.

Referring now to the drawings in detail, the invention is shown as broadly including a dispensing portion, indicated generally by the numeral **10**, and a brushing portion, indicated generally by the numeral **11**. Practically all of the components of the device are preferably molded of a suitable plastic material, although metal or other materials could be used.

The dispensing portion **11** preferably comprises a cylindrical barrel **12**, enclosed at one end by the end wall **13**. Slidingly fitted within the barrel is a generally disc-shaped plunger **14** having a centrally located longitudinally extending bore **15**. Extending across the rear opening of the bore in a valve means, for a purpose which will later be apparent, which may be comprised of a membrane **16** formed of flexible material and provided with a pair of diagonally slit openings **17**, as shown in FIG. 5, defining a series of circumferentially arranged flaps **18**. If the plunger is formed of some pliable material, such as polyethylene or the like, the membrane **16** can be integrally formed with the plunger to provide sufficient flexibility for the flaps **18** to be capable of yielding movement.

A dentifrice, or other material to be dispensed to the brush, preferably in paste form, is contained within the barrel between the end wall **13** and the sliding plunger **14**, as indicated by the numeral **19**.

The brush portion **10** comprises an elongated tubular shank **20**, preferably formed of some plastic material, having a set of bristles **21** embedded along the side at one end. Appropriately disposed within the midst of the bristles is a radially outwardly extending feeder tube **22**, composed of some soft pliable material such as plastic or rubber, preferably plastic, which is in communication with the hollow interior **23** of the shank. The other end of the shank is received within the barrel **12** and is provided with a radially projecting annular boss **24** slidably received therein. In order to permit free sliding movement of the shank, the boss is provided with one or more longitudinally extending air passages **25**, as may best be seen in FIG. 6.

The other end of the shank is also provided with an axially projecting cylindrical coupling portion **26** which may be slidably received in close fitting engagement within the bore **15** of the plunger. The outer end of the coupling is closed by a flexible membrane **27** provided with one or more diagonally extending slits **28** to provide a valve means for retaining paste contained within the hollow interior of the shank. As in the case of the membrane **16**, the membrane **27** may be formed integrally with the shank portion or it may be formed separately and secured to the shank by suitable adhesive or other means.

The shank **20** is contained within the barrel **12** by means of a removable cap **29**, provided with an inwardly projecting annular flange **30**, against which the outer shoulder **31** of the boss **24** will abut when the shank is fully projected. In addition, the flange may be provided with one or more recessed dimples **32** (see FIG. 7) within which the projections **33**, provided on the exterior of the shank, will be received to prevent relative rotation of the shank with respect to the barrel when the brush is in use.

The cap **29** is preferably formed of slightly flexible plastic in order to permit the projections **33** to pass from one side to the other of the flange **30** when it is desired to retract the shank. The cap may be secured to the barrel by threaded engagement, but as shown in the drawings, an annular recess may be provided for snap-on engagement with the annular bead **34**. To protect the brush portion for packing and traveling, and to prevent the toothpaste from becoming hard or caked due to exposure, a clear plastic cover **35** may be provided, the open end of which may be provided with an inwardly extending flange for snap-on engagement with an annular bead **36** provided on the cap **29**.

In use, the interior of the barrel **12** is first filled with an appropriate material such as a dentifrice, preferably in paste form, by removing the cap **29** and the plunger **14**. Or, since the barrel may be made of inexpensive plastic material, it may be prepacked with toothpaste by the manufacturer with the plunger **14** already in position, so that when the paste has been used, the barrel and plunger may be discarded entirely. The plunger is then replaced with the membrane **16** in contact with the paste. The shank **20** is replaced by inserting the coupling portion **26** within the bore of the plunger, so that the boss **24** may be received within the outer end of the barrel. The cap **29** is then attached so that the relative positions of the elements will be as shown in FIG. 2.

When it is desired to dispense some of the paste material on the bristles, the shank **20** may be moved towards the right with respect to the valve, as shown in FIG. 3; the force required being sufficient to push the projections

33 past the flange 30 by temporarily distorting the cap. This movement of the shank will cause the boss 24 to come into abutting engagement with the plunger 14, thus causing it to move towards the right and forcing paste contained within the space 19 to deflect the flaps 18 of the membrane 16 and the similar flaps of the membrane 27 to permit the material to pass to the left into the interior passage 23 of the shank to the feeder tube 22, and finally upward to be distributed adjacent the upper ends of the bristles 21.

When a sufficient amount of paste has been dispensed in this manner, the shank 20 is disengaged from the plunger and returned to its projected position as shown in FIG. 4; the projections 33 being seated within the dimples 32. It will be noted that the plunger 14 will remain in position adjacent the supply of paste and that the presence of the valve means formed by the respective membranes 16 and 27 will effectively prevent leakage of the paste from the chamber 19 and the hollow passage 23. However, whenever an additional amount of material is desired on the bristles, it is only necessary to move the shank again towards the right so that with the coupling 26 received within the bore of the plunger, further movement of the plunger towards the right will cause additional amounts of paste to be forced into the interior of the shank and up to the area of the bristles.

While the present invention has been described and shown as having particular utility in the form of a toothbrush, it should be understood that it may be modified for use in other applications where it is desired to dispense a viscous or paste-like material to a surface to which a brushing action is to be applied.

Having disclosed a preferred form in which the invention is to be practiced, it should be understood that such other modifications and improvements may be made by those skilled in the art which would come within the scope of the annexed claims.

I claim:

1. In a fountain brush, a hollow cup-shaped container, an elongated shank having one end slidably received within one end of the cup-shaped container and having brushing means at the other end, a movable valve means in said container between the one end of said shank and the other end of the container, passage means between the brushing means and the interior of the container at said one end of the shank, said movable valve means being slidable to direct material in the container into said passage means when said shank is moved longitudinally with respect to the container in one direction, and means to restrict relative rotational movement between the shank and the container.

2. In an article of the class described, a cylindrical container for fluent cleaning material, an elongated shank having one end longitudinally received within the container, brushing means mounted at the other end of the shank, said shank including interior passage means communicating between the brushing means and the interior of the container, removable deformable cap means received on one end of the container and having an opening through which said shank is longitudinally movable into said container to force said fluent material to the brushing means, said cap and said one end of the container being provided with interfitting flange-and-groove retainer means, said one end of the shank being provided with radially directed detent means, said cap being provided with a depressed portion for interfitting engagement with said detent means to fix the shank longitudinally and rotationally, said cap being deformable for said interfitting engagement of the flange-and-groove means and being deformable to permit disengagement of the detent means when the shank is forcibly moved into the container.

3. In an article of the class described, a cylindrical container for fluent material, an elongated member having one end longitudinally movably received within the container and having brushing means mounted at the other end, said member having an internal conduit communicating between said one end and said brushing means, a cylindrical plunger means slidable in said container, said plunger means having a passage extending therethrough, said one end of the elongated member being movable into abutting engagement with the plunger means whereby one end of the conduit means will be in registry with said passage to force fluent material in the container through said passage and said conduit, and detent means for positioning said elongated member in a fixed position with respect to the container both longitudinally and rotationally when the brushing means is used.

4. The invention as defined in claim 3, wherein a portion of said one end of the elongated member is cylindrically formed in close-fitting slidable engagement with the interior wall of the container, said portion having passage means for allowing confined air to pass between opposite ends thereof for assisting longitudinal movement of the elongated member.

5. The invention as defined in claim 3, wherein said one end of the elongated element terminates in a longitudinally extending tubular portion which is closely received in said passage in the plunger, said tubular portion including a radial shoulder for said abutting engagement with the plunger.

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