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DISPENSING CAP FOR SQUEEZE-TYPE CONTAINERS

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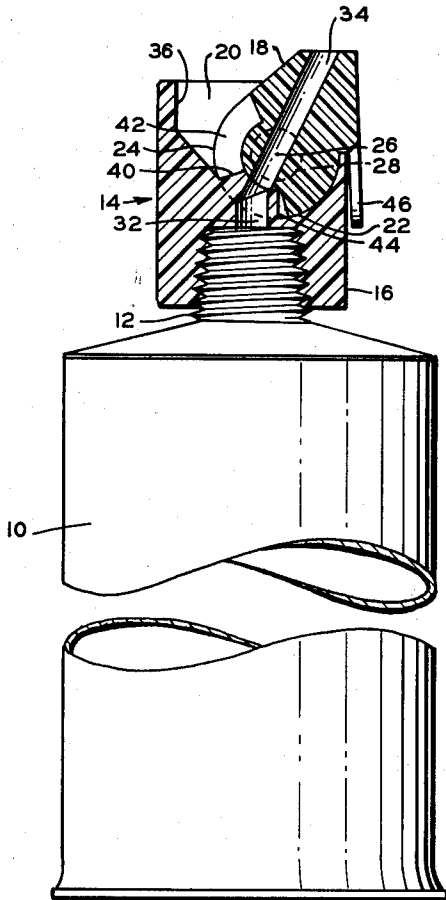


FIG. 1.

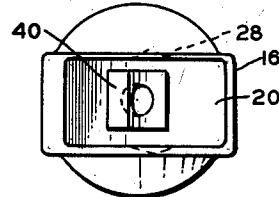


FIG. 2.

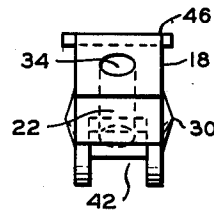


FIG. 3.

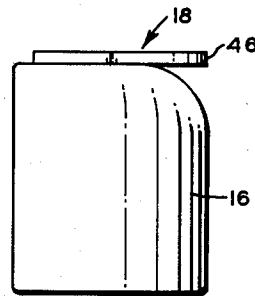


FIG. 4.

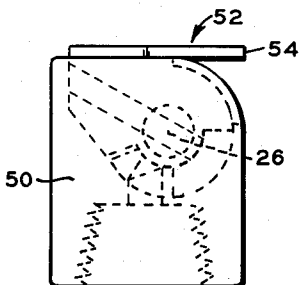


FIG. 5.

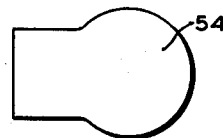


FIG. 6.

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DISPENSING CAP FOR SQUEEZE-TYPE CONTAINERS

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5 Claims. (Cl. 222-536)

This invention relates to means for dispensing pastes and viscous fluids from squeeze-type containers.

Materials such as tooth paste, shaving cream, medicinal ointments, cements, caulking and sealing compounds, etc., are packaged and sold in compressible metallic tubes. Such tubes roll up from one end and dispense the contents by extrusion through an orifice in the opposite end which is sealed by a metal membrane integral with the neck of the tube and/or a screw cap of metal or plastic threaded onto the neck. In dispensing such materials as tooth paste, the consumer removed the cap by unscrewing the same from the tube neck and squeezes out the desired amount of paste onto a tooth brush, thereafter replacing the cap to seal the end of the tube.

Various types of squeeze containers made of resilient flexible plastic are used to package fluid materials adapted to be squeezed out of the container through an orifice or outlet therein usually capped by a screw cap when not in use.

When the containers of the class described are in use, the cap frequently becomes misplaced or lost thereby leaving the outlet unsealed. This is unsanitary in many instances and, in others, allows degradation of the material in the container.

Even when the cap of the tube is not mislaid or lost, excess material gradually builds up in the threads of the cap and on the shoulder of the tube which is unsanitary and wasteful of the material being dispensed.

I have devised a cap for dispensing extrudable materials from squeeze-type containers which overcomes the foregoing difficulties.

Accordingly, it is an object of the invention to provide improved means for dispensing flowable or extrudable materials from squeeze-type containers. Another object is to provide a dispenser cap for squeeze-type containers which does not require removal for dispensing. A further object is to provide a dispensing device which saves time in dispensing and improves the sanitary aspects of dispensing from squeeze-type containers. It is also an object to provide a rapid dispensing device which facilitates sealing the tube end without cap removal or replacement. A further object is to draw the material in the tube of the dispensing cap back from the delivery end after each use so as to improve the sanitary aspect of the cap.

In order to provide a full understanding of the invention, reference is made to the accompanying schematic drawing of which FIGURE 1 is a side elevation of a tubular squeeze-type container, showing one embodiment of the dispensing cap of the invention, in partial section; FIGURE 2 is a top view of the cap of FIGURE 1 with the spout removed; FIGURE 3 is a front elevation of the spout of FIGURE 1; FIGURE 4 is a side elevation of the cap of FIGURE 1; and FIGURES 5 and 6 are top and side views, respectively, of a second embodiment of the invention.

Referring to FIGURES 1 thru 4, a squeeze container 10 is provided with a threaded outlet 12 to which is attached a cap 14 comprising a cap body 16 and a spout 18. Cap body 16 is threaded onto outlet 12 but any suitable attaching means may be used.

The cap of FIGURE 1 is a vertical section on a plane thru the center perpendicular to the axis on which the spout revolves and parallel with the plane of rotation. Cap body 16 has a cavity 20 comprising a concave segmental cylindrical section 22 adapted to sealably and

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slidably engage a convex segmental cylindrical section 24 on spout 18. The axis of these cylindrical sections is located at point 26. Opposite side walls of cavity 20 are provided with axial bearing recesses 28 which engage conical bearings 30 to allow rotation of the spout 18 in cavity 20 on axis 26.

A conduit or passageway 32 in registry with an orifice in outlet 12 extends upwardly thru cap body 16. A conduit 34 thru spout 18 is positioned to be rotatable into and out of registry with conduit 32. Spout 18 is shown in position for dispensing, with conduit 34 in registry with conduit 32. By rotating the spout counterclockwise, conduit 34 is rotated out of registry with conduit 32 so that no material in container 10 can be dispensed thru the cap. Rotation seals the outer end of conduit 34 against the inner wall 36 of cavity 20.

The most significant feature of the invention lies in the structure in the base of cavity 20 and the adjacent section of spout 18. Surrounding the upper end of conduit 32 is a crateriform protuberance 40 which extends into circumferentially elongated segmental annular slot 42. Both the upper end and the lateral sides of protuberance 40 which are parallel with the plane of rotation of the spout sealably and slidably engage the circumferential bottom of slot 42 and the walls thereof. In other words, protuberance 40 extends the depth of slot 42 and has an upper end in the form of a concave segmental cylinder to engage the convex segmental cylinder forming the bottom of the slot. These cylindrical surface (slot bottom and top of protuberance) must have the axis 26 to facilitate rotation sealing. Slot 42 is long enough to permit rotation of cap 18 from the registry or dispensing position shown to the completely closed position (shown in FIGURE 6) without the ends of the slot contacting protuberance 40 and interfering with the extent of rotation required.

The manner in which the cap operates in sucking material, being dispensed, back into the dispensing conduit (34) will now be discussed. As spout 18 is rotated to the left (counterclockwise) slot 42 rotates with the spout and forms an expanding suction chamber 44 back of or to the right of protuberance 40 due to the sealing engagement of the protuberance with the slot. This positions the inner end of conduit 34 in communication with the suction chamber so that paste or other extrudable material in this conduit is forced by air pressure (or suction) back into the suction chamber.

When it is again desired to dispense paste, spout 18 is rotated into dispensing position and the paste which entered the suction chamber is now forced back into conduit 34. In this manner the outer end of conduit 34 is maintained substantially free of paste when the cap is not dispensing. This facilitates sanitation and convenience in use of the cap.

FIGURES 5 and 6 illustrate a cylindrical embodiment of the dispensing cap. Cap body 50 is cylindrical and spout 52 is provided with a flat segmental disc top 54 which engages the top of body 50. Both the embodiment of FIGURES 1-4 and of FIGURES 5 and 6 provide a flat top suitable for standing the squeeze container upright on the end of the cap when not in use.

The contour and shape of the cap may be varied to suit conveniences and the aesthetic sense without departing from the essence of the invention, which comprises the means in the base of the cap cavity and in the cooperating adjacent section of the spout for withdrawing material in the dispensing conduit inwardly away from the outer end thereof after dispensing and returning the withdrawn material during the next dispensing step.

The cap shown and described can be made in two pieces, viz., the cap body and the spout. By making these members of resiliently flexible plastic material, such as synthetic thermoplastic materials, spout 18 may be readily

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snapped into place in cavity 20. This requires merely springing the walls of cavity 20 outwardly sufficiently to allow bearing members 30 to enter the cavity and slip into bearing recesses 28. Any stable inert material capable of resuming a pre-existing configuration following limited deformation can be used as the cap material. Polyolefins, such as polyethylene, copolymers of ethylene and other olefins, polypropylene, and similar plastics may be used. "Marlex" polyolefins are particularly well suited to such use. However, other materials may be used, and the cap may be formed of more than two pieces.

I claim:

1. A dispensing cap for a squeeze type container comprising a cap body having a segmental cylindrical cavity in an upper portion thereof, means in its bottom portion for attaching to an outlet in said container, a conduit extending upwardly centrally therethru positioned for registry with said outlet; a spout in said cavity having a segmental cylindrical configuration on its lower side for frictional engagement in said cavity to form a rotatable seal therewith, said spout being pivoted in said cavity at the axis of the cylinders of both said cap and said spout; a crateriform protuberance surrounding the upper end of said conduit; a circumferentially elongated segmental cylindrical slot in the cylindrical portion of the lower side of said spout engaging and forming a slidable seal with the sides and end of said protuberance; a dispensing passageway thru said spout rotatable with said spout into and out of registry with said conduit and the opening in said protuberance, rotation of said spout out of dispensing position forming a suction chamber in said slot between said protuberance and one end of said slot to which said passageway is exposed so that suction is applied therethru to draw dispensed material back into said passageway from its outer end.

2. A dispensing cap for squeeze type containers comprising a cap body having a segmental cylindrical cavity

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in one end and means in the other end for attaching same to an outlet of said container; a conduit thru said cap body in registry with said outlet; a spout having a passageway therethru and a convex segmental cylindrical contour slidably and sealably engaging said cavity and pivoted axially of the cylindrical segments so as to permit rotation of said spout and passageway into and out of registry with said conduit; a circumferentially elongated segmental annular slot coaxial with said segments positioned in the cylindrical segment of said spout; a crateriform protuberance surrounding the end of said conduit and extending into said slot in slidably sealable engagement with the sides and bottom thereof, whereby rotation of said spout so that said passageway is out of registry with said conduit forms a suction chamber in the vacated section of said slot and connects said passageway therewith so that material being dispensed in said passageway is drawn back from the dispensing end thereof.

3. The cap of claim 2 wherein said cap body is flexibly resilient and said spout is forcibly removable from and insertable into said cavity by temporary deformation of said cap body.

4. The cap of claim 2 wherein said spout is provided with convex conical bearings engaging concave conical seats in the walls of said cavity.

5. The cap of claim 4 wherein said cap body and protuberance are integral and molded in one piece and said spout is molded in one piece.

References Cited in the file of this patent

UNITED STATES PATENTS

1,430,313	Millity	Sept. 26, 1922
2,717,726	Mart	Sept. 13, 1955

FOREIGN PATENTS

763,782	France	Feb. 19, 1934
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