

May 31, 1960

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2,938,653

DISPENSING CAP FOR TUBULAR CONTAINERS

Filed March 29, 1957

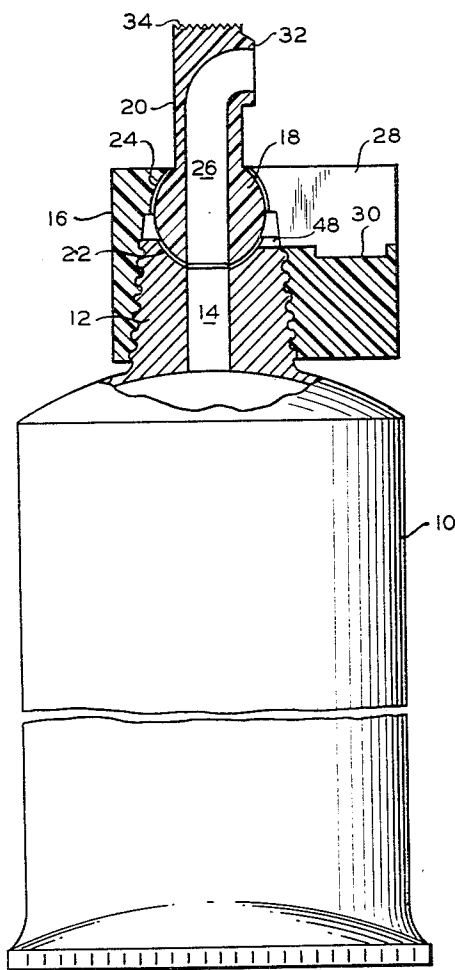


FIG. 1.

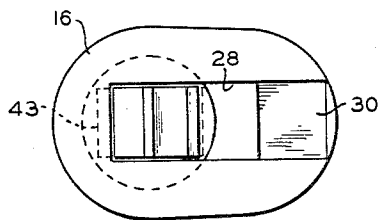


FIG. 3.

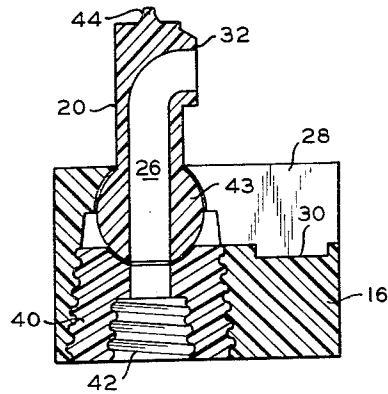


FIG. 2.

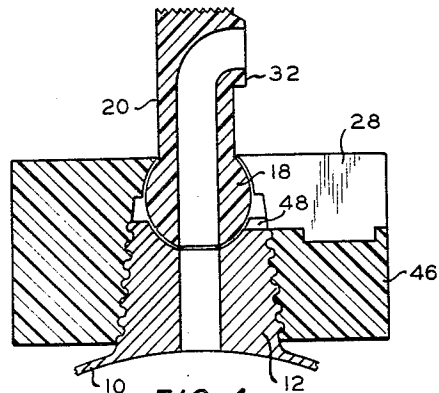


FIG. 4.

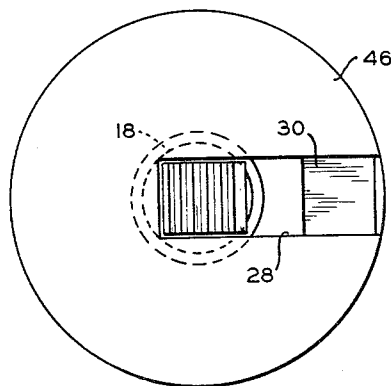


FIG. 5.

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DISPENSING CAP FOR TUBULAR CONTAINERS

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Filed Mar. 29, 1957, Ser. No. 649,469

9 Claims. (Cl. 222—536)

This invention relates to means for dispensing pastes and viscous fluids from tubular 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 thru 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 removes 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.

While tubular containers are handy to use, the cap is frequently mislaid or dropped on the floor during use thereby leaving the open end of the tube unsealed. This is unsanitary when the contents are to be used internally and also causes drying out of the contents of the tube.

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.

We have devised means for dispensing extrudable materials from tubular containers without removal and replacement of a cap or other closure device.

Accordingly, it is an object of the invention to provide improved means for dispensing flowable or extrudable materials from tubular containers. Another object is to provide a dispenser cap for tubular 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 tubular containers. It is also an object to provide a rapid dispensing device which facilitates sealing the tube end without cap removal or replacement. Other objects of the invention will become apparent from a consideration of the accompanying disclosure.

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 view of a tubular container, showing one embodiment of the dispensing device of the invention, in partial section; Figure 2 is a cross section of a dispensing device utilizing an adapter; Figure 3 is a top or plan view of the dispensing device of Figure 2; Figure 4 is a cross section of a dispensing device similar to that of Figure 1; and Figure 5 is a top or plan view of the dispenser of Figure 4.

Referring to Fig. 1, a flexible, compressible, tubular container 10 is closed in conventional manner on the lower end and terminates at the opposite end in a threaded neck or nipple 12 which is provided with an axial passageway 14. A threaded cap 16 screws onto nipple 12 and clamps expanded (ball) section 18 of dispensing tube 20 against a cupped bearing and sealing surface 22 of nipple 12. Cap 16 is also provided with a bearing and sealing surface 24 which engages expanded

section 18. Dispensing tube 20 is provided with a passageway 26 which aligns with passageway 14 of nipple 12 when tube 20 is axially aligned with tubular container 10. Nipple 12 and section 18 of tube 20 occupy a conduit through cap 16. When dispensing tube 20 is in the position shown, material (such as tooth paste) may be extruded thru passageways 14 and 26 by compression of tubular container 10. A recess 28 in cap 16 extends at right angles to the tube axis toward the cylindrical periphery of the cap. The outer end of tube 20 is blind and passageway 26 opens through a lateral side of the dispensing tube, leaving annular surface 32 surrounding the end of the passageway. After use of the dispensing device, tube 20 is rotated 90° into recess 28 which contains a receiving and sealing means 30 for surface 32 of tube 20 comprising a depressed plain surface adapted to engage surface 32 uniformly around the outer end of passageway 26. A corrugated surface 34 on the outer blind end of tube 20 provides means for lifting this tube out of its recess, into dispensing position.

Figure 2 shows a device similar in most respects to the device of Figure 1 but with the added feature of an adapter 40 which screws onto the neck 42 of a tubular container such as 10 of Figure 1. This arrangement of dispenser cap and adapter is of general application to various tubular containers where a single dispensing device is to be used on a sequence or plurality of tubes and is not to be disposed of after each container is emptied.

In Figure 2, the expanded end of tube 20 comprises a cylindrical section 43 whose axis is transverse to the axis of the tube. A narrow projection 44 on the blind outer end of tube 20 is transverse to the direction of rotation of the tube and provides means for raising the tube out of its recess when sealed therein.

Figure 3 shows a top view of the device of Figure 2 and is self-explanatory. Figures 4 and 5 show a circular cap 46 as contrasted with the oval or elliptical cap of the first three figures. The expanded section 18 of tube 20 is spherical in this embodiment of the invention as in Figure 1.

In use, the dispensing tube 20 seals with caps 16 and 46 because of the close engagement of the surface 22 of the neck of the container (or adapter) around the passageway 14 therein and of surface 24 of the underside of the cap with the spherical or cylindrical surface of the expanded end of the tube. This prevents waste and drying out of the material in the container.

The expanded section 18 or 43 of tube 20 should be enough larger than the main portion of the tube to permit rotation of the tube into its recess 28 without causing the main tube section to bind on or strike the end of neck 12 or adapter 40. Figures 1 and 4 show cut-away section 48 on neck 12 and adapter 40, which provide ample clearance for the main tube section when the tube is in its recess.

A significant feature of the invention lies in the recess for the tube which permits sealing of the open end thereof without the necessity of a screw cap or other "nuisance" means for closing the tube end. Without this feature little of any advantage in the device would be obtained. If desired, a soft, resilient pad, such as one made of rubber, may be positioned on surface 30 to aid in sealing the open end of tube 20. It is also feasible to construct the end of tube 20 around the opening therein in the form of a truncated cone so that a narrow or sharp annulus of material (surface 32) uniformly contacts surface 30. Tube 20 may be of either circular or regular polygonal cross section.

Conventional plastic materials which are used for making tube caps are suitable for construction of the

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dispensing cap of the invention. A particularly suitable material comprises a high grade polyolefin plastic sold under the name "Marlex," which is a trademark of Phillips Petroleum Company of Bartlesville, Oklahoma.

While the invention has been described in connection with a present, preferred embodiment thereof, it is to be understood that this description is illustrative only and is not intended to limit the invention.

We claim:

1. A dispensing device comprising in combination a closure cap for the open end of a tubular container having means for attachment thereto; a dispensing tube extending from the under side of said cap outwardly thru and beyond the top thereof providing a passageway for materials to be dispensed, said tube having an expanded end within said cap forming a rotatable seal with the underside thereof and having a rotatable sealing surface on said expanded end adapted to form a seal with the end of said tubular container around the opening therein, the passageway thru said tube making a turn of about 90° at its outer end so as to open thru the side thereof, and provide a blind end on said tube; a recess in the top of said cap extending from the open side of said tube toward the periphery of said cap, said tube being rotatable into said recess thereby closing said tube to flow from said tubular container; a flat sealing surface around the opening in the outer end of said tube; and a flat engaging surface in said recess cooperating with said sealing surface to seal said opening in said recess when said tube is rotated into same.

2. The device of claim 1 wherein said expanded end is generally spherical.

3. The device of claim 1 wherein said expanded end is generally cylindrical with its axis perpendicular to the axis of said tube.

4. The device of claim 1 including means for raising said tube from said recess into dispensing position comprising a projection on the blind end of said tube.

5. A dispensing device comprising in combination a closure cap having means for attachment to a tubular supply line; a conduit thru the top of said cap; a recess in the top of said cap extending from the outer end of said conduit toward the periphery of said cap; a ball of larger diameter than said conduit engaging the inner end thereof; a dispensing tube fixed to said ball and extending outwardly thru said conduit beyond the top of said cap, the passageway thru said tube being curved at its outer end so as to open thru the side of said tube; a passageway thru said ball connecting with said tube, said tube and ball being rotatable in one direction to position said tube in said recess and in the opposite direction to a dispensing position with said tube aligned with said tubular supply line; and sealing means for the opening in the outer end of said tube comprising a surface in said recess which sealably engages a surface entirely surrounding said opening.

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6. In combination a compressible tubular container having attached to one end a dispensing device comprising a closure cap for an opening in the end of said container; a dispenser tube providing a passageway for materials to be dispensed extending from the open end of said container out thru and beyond said cap when in alignment with said tubular container, the passageway thru said tube opening at the outer end thru the side of said tube to provide a blind outer end thereon; an arcuate expanded section on the inner end of said tube clamped between said cap and the end of said container so as to form a rotatable seal with said cap and with the end of said container; a recess in the top of said cap adapted to receive the exterior section of said tube when said tube is rotated about said arcuate expanded section; a sealing surface surrounding the opening in the outer end of said tube; and a cooperating engaging sealing surface in said recess.

7. The combination of claim 6 including means for raising said tube from said recess into dispensing position comprising a projection on the blind end of said tube transverse to the movement of said tube out of said recess.

8. A dispensing device for a container comprising in combination a closure cap for an open end of said container having means in its bottom for attachment to said open end; a conduit extending upwardly thru said cap adapted to align with said open end; a dispenser tube having a materials passageway therethrough and an expanded lower end seated in and rotatably sealable with the wall of said conduit, the outer end of said tube being blind and extending well beyond the top of said cap and the dispensing end of said passageway opening thru a lateral side of said tube; a recess in the top of said cap extending radially from said conduit and adapted to receive said tube when rotated thereinto; and a sealing surface in said recess for the section of said tube around the opening in its outer end so that when said tube is rotated into said recess its open outer end is sealed in said recess and its inner end is sealed in the wall of said conduit.

9. In combination a compressible tubular container having attached to one end the dispensing device of claim 8.

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