

[54] CAPTIVE DISPENSER CAP

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[57] ABSTRACT

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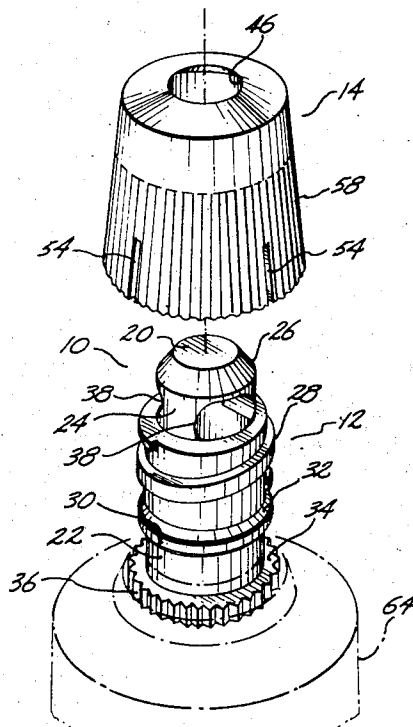
A hollow core with one end closed and the other end opening into and joined to a container, the core has an area of reduced cross-section, then is beveled inward to the closed end, at least one opening extends through the side of the reduced area, a shell mounted to the core has an opening at its outer end, the sides of which contact the core beveled surface when the shell is fully inserted to form a seal and means to provide for movement between open and closed position of the shell and means for limiting the outward travel of the shell.

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[51] Int. Cl. B67d 3/02
[58] Field of Search 222/521, 519, 520, 523,
222/525, 522

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6 Claims, 12 Drawing Figures



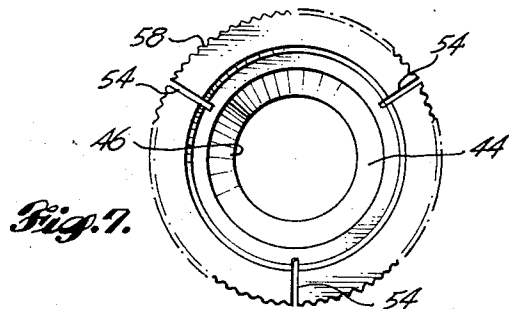
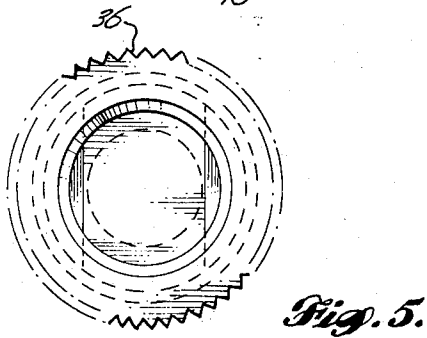
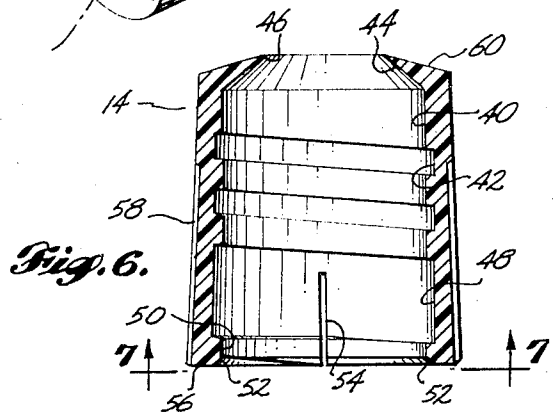
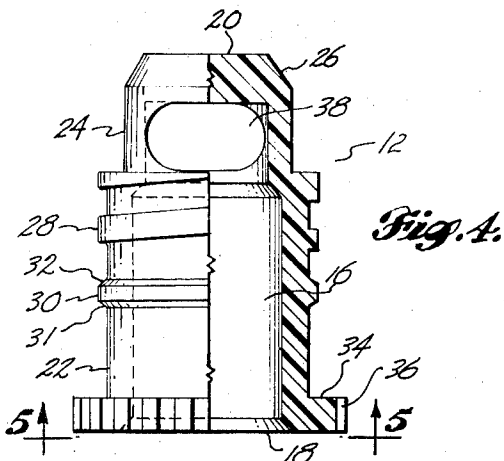
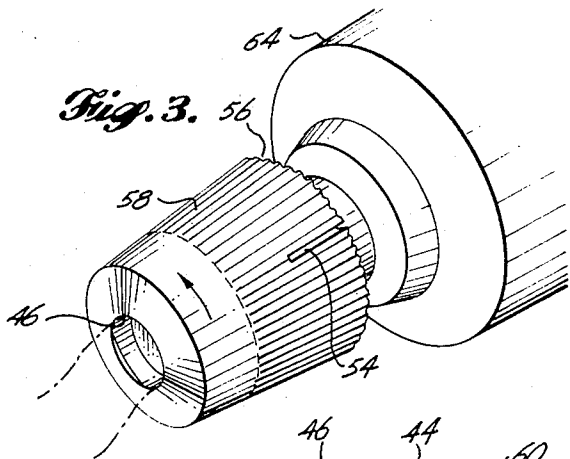
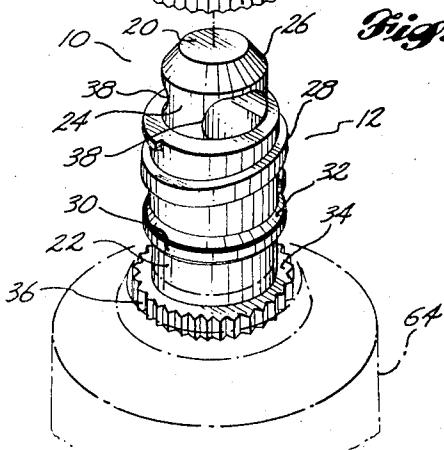
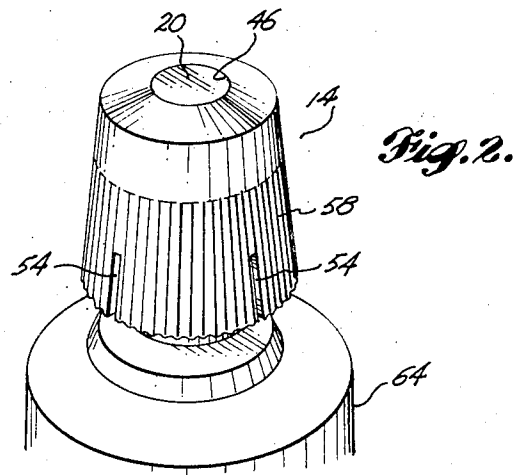
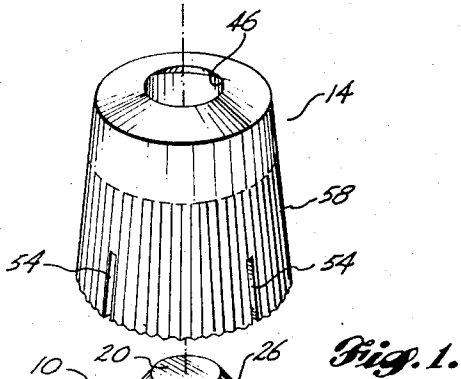


Fig. 8.

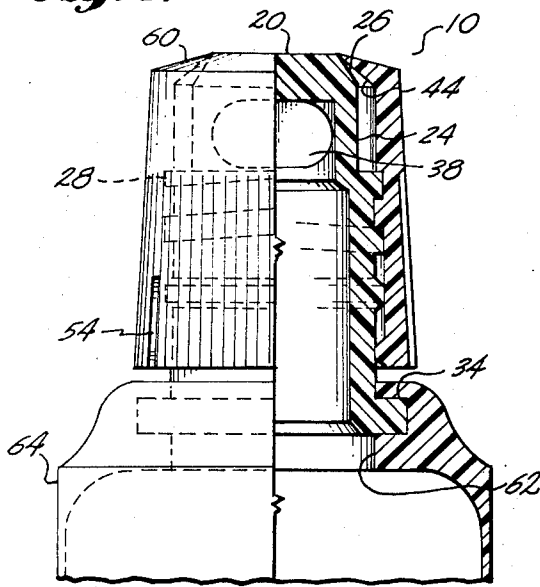


Fig. 9.

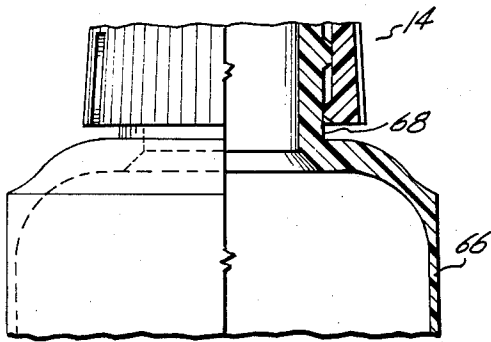
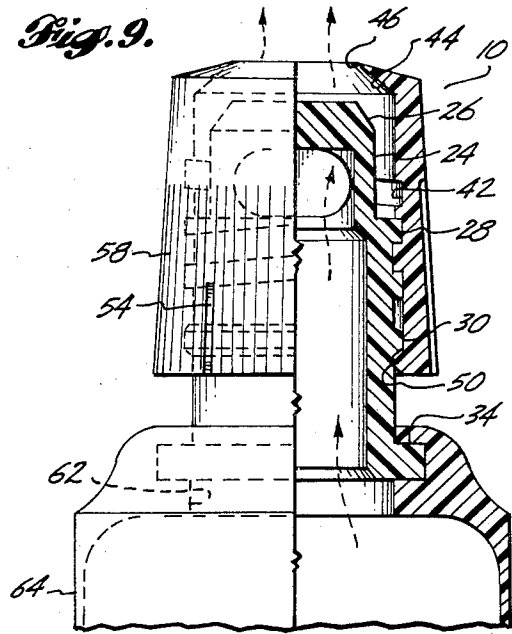


Fig. 10.

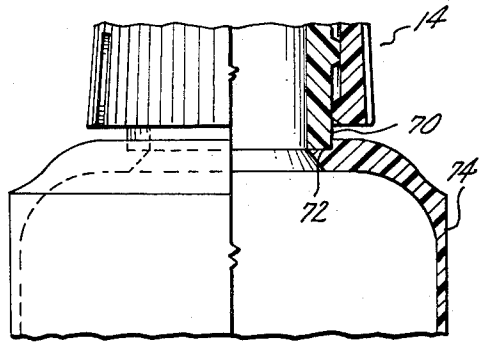


Fig. 11.

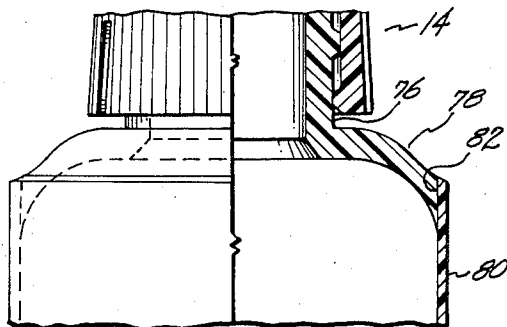


Fig. 12.

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CAPTIVE DISPENSER CAP

BACKGROUND OF THE INVENTION

Dispensers for pastes, ointments and other semi-liquid products are normally dispensed through an aperture from a container which may be squeezed to force the product through the aperture. Many types of caps have been used for these dispensers with the simplest being a cap that screws on and off. Often the removed cap is dropped or misplaced with its inherent annoyance. Captive types of caps are formed of several parts which are expensive to manufacture or use stop lugs which are bent into position once the cap is mounted.

BRIEF SUMMARY OF THE INVENTION

This invention of means for dispensing a paste or semi-liquid fluid type of contents from a container has a hollow cylindrical shaped core, one end of which is open and is either fastened to the mouth of a container or is integral with the container and constitutes a neck extending out from the container. The other end of the core is closed. The side extending from the closed end is beveled outward to a reduced diameter section of the core having at least one opening in the side in the area having the reduced diameter. A shell-like cap is mounted to the core by rotating to advance the cap along matching threads on the outside of the core and the inside of the cap.

The outside end of the cap has an opening at least as large as the end of the core where the bevel starts. The cap has a bevel extending from the opening to its inside diameter. The angle of bevel on the cap is larger than the angle of bevel on the core which forms a tight seal when the fully inserted cap contacts the end of the core. When the cap is counter rotated contents from inside the container may flow between the reduced diameter of the core and the inside of the cap, thence through the opening in the end of the cap.

The mounted cap becomes captive and upon counter rotation the rectilinear movement of the cap is limited unless one exerts an excessive rotational force.

The cap becomes captive due to a beveled ring circumscribing the core which contacts an inwardly extending projection inside the cap. The projection has a partial spiral taper and the cap has longitudinal slots which in combination allow the projection to override the ring when advancing but does not allow overriding when moving in the reverse direction.

An object of this invention is to provide for dispensing a semi-liquid fluid through the top of a dispensing cap which then mounted is held captive.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows an exploded perspective view of a cap and core of a dispenser with the core referenced to a container.

FIG. 2 shows a fragmented perspective view of a mounted core with cap in the closed position.

FIG. 3 shows a fragmented perspective view of a mounted core and cap with the cap in the open position.

FIG. 4 shows a side elevation of a core of FIG. 1 partially in section.

FIG. 5 shows a view taken along section 5—5 of FIG. 4 of a complete core.

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FIG. 6 shows a side elevation in section of a cap.

FIG. 7 shows a view taken along section 7—7 of FIG. 6 of a complete cap.

FIG. 8 shows a fragmented side elevation partially in section of a core fixed to a container and with a cap in the closed position.

FIG. 9 shows the dispenser of FIG. 8 with the cap in the open position.

FIG. 10 shows a fragmented view of the side elevation of a dispenser, partially in section, where the core is integral with the container.

FIG. 11 is a fragmented view of the side elevation of a dispenser, partially in section, showing a variation in the joining end of the core.

FIG. 12 is a fragmented view of the side elevation of a dispenser, partially in section, showing yet another variation in the joining end of the core.

DETAILED DESCRIPTION

Dispenser 10 is made up of core 12 and a covering shell or cap 14. The core is hollow 16 and one end 18 is open and the other end 20 is closed. The core is cylindrical shaped with first diameter 22 extending from the open end and a second reduced diameter 24 near the closed end. Bevel 26 extends from the reduced diameter inwardly to the end. The larger first diameter has a fast movement course thread 28 extending outwardly from its surface, an encircling ring 30 having bevel 32 on the side nearest the threads, and an outwardly extending projection 34, having serrations 36 around its outer circumference. The second or reduced diameter section of the core has at least one opening 38, and in this embodiment has two such openings through its side.

The shell or cap 14 has inside surface 40 with an inside diameter slightly larger than core diameter 22. Recessed threads 42 in the cap are located to work in conjunction with core threads 28. The cap has bevel 44 extending inwardly from the inside diameter to the sides of opening 46. The angle between the beveled surface and the inside of the cap is at an angle greater than the angle between the reduced diameter and the bevel of the core to assure a line of contact seal when the cap is fully inserted onto the core. Preferably the angle of bevel on the cap is about ten degrees greater than the angle of the bevel on the core. Recess 48 allows clearance for core ring 30 to permit free movement of the cap. Projection 50 extends inwardly and has a partial spiral taper and the bottom side 52 is beveled. The partial spiral taper on the inwardly extending projection preferably is tapered to match the taper on the threads 42. The bevel 52 of projection 50 is at essentially the same angle as bevel 32 on ring 30 of the core 12 with about 45° being the preferred angle to allow the projection to override the ring when mounting the cap. The side 31 of ring 30 may have a sharp angle of bevel as shown or may be essentially vertical to prevent the projection from riding back over the ring when the mounted cap is rotated to the open position. Longitudinal slots 54 extend upward from the bottom of skirt 56. The sides of the skirt 58 are knurled and the top 60 is beveled.

The core 12 is fastened to the mouth 62 of a container 64. This may be accomplished by rolling the mouth of the container around the projection 34 of the core. The serrated outer side 36 of the container assures a good connection.

In another embodiment of a dispenser the core is integral with the container. See FIG. 10 where the container 66 merges into neck 68 which is similar to core 12 and would be identical except for fact the neck does not have projection 34 with serrated side 36.

In another embodiment, see FIG. 11, a core 70 is similar to core 12, but has a square end 72 which is fastened to container 74 by either heat sealing or by use of an adhesive.

In another embodiment, see FIG. 12, a core 76 is similar to core 12, but has an outwardly extending shoulder 78 which is joined to container 80 at end 82 by either heat sealing or by use of an adhesive.

To mount the shell or cap 14 to the core 12, the shell is positioned as in FIG. 1, then placed over the core and rotated. The partial spiral taper in projection 50 allows the projection to override the threads 28. Recessed threads 42 in the shell are engaged in the core threads when the projection encounters the ring 30. Thrust from the threads; bevel surface 32 on the ring; the partial spiral taper and beveled surface 52 on the projection; and the longitudinal slots 54, all combine to allow the projection to override the ring. Once the projection has passed the ring it may not ride back over the ring unless excessive force is applied. The cap thus becomes captive. When the cap is closed as shown in FIGS. 2 and 8, the sides of the opening 46 of the cap contact beveled surface 26 to effectively close in the contents of the container. To dispense contents of the container 64, the cap is counter rotated to move with a rectilinear motion away from the core. Its outer movement is limited, however, as the projection on the shell engages the ring on the core to limit its travel. In the open position fluid from the container passes through the mouth 62 of the container through the inside 16 of the core 12 thence through the opening 38 and into the space between the reduced core diameter 24 and the inside of the shell 40, thence out the top of the opening 46.

We claim:

1. A movable captive cap in combination with and threadably mounted to a hollow core having one end closed, said core communicating with the contents of a container and the combination providing, at one end of the cap travel, a passage from the inside of the container through first the inside then the side of the core, thence between inwardly extending beveled outer surface to the closed end of the core and inwardly extending beveled inner surface of the cap, said bevel extending to an opening in the end of the cap, at the other end of the cap travel the inside edge of the cap opening contacts the core beveled surface to seal in the contents of the container, wherein a means for making the cap captive comprises: an outwardly extending ring encircling the core located below the threads and having the side nearest the threads beveled; a series of longitudinal slots extending upward from the lower end of the cap; and an inwardly extending projection having a partial spiral taper located on the cap below the threads, when the cap is rotated said projection with spiral taper rides over the threads on the core and with further rotation the meshed threads cause the projection to override the ring encircling the core, but it may not override coming back.

2. A movable captive cap in combination with a hollow core as in claim 1, wherein the partial spiral taper

on the cap inwardly extending projection is tapered to match the taper on the core threads.

3. A two piece captive cap for dispensing contents from a container comprising: a hollow cylindrical shaped core having an opening at one end, means for fastening the core to a container with the open end of the core in communication with the inside of the container; a reduced diameter contiguous to the closed end of the core having at least one lateral opening; an inwardly extending beveled surface extending from the reduced diameter to the closed end of the core; a shell covering the core having a beveled surface, at an angle larger than the angle of the bevel on the core, extending inwardly from an inside diameter of the shell to an opening in the end of the shell; a set of matching threads on the outside of the core and the inside of the shell to allow rectilinear movement of the shell when rotated such that at one end of travel the contents may flow between the reduced diameter of the core and the inside of the shell, thence through the opening in the shell and at the other end of travel the sides of the opening of the shell contact the beveled portion of the core to retain the contents; a ring encircling the core at a point below the threads and having a bevel on the side nearest the threads; a projection extending inwardly from the shell having a partial spiral taper; and a series of longitudinal slots extending from the extremity of the shell, when rotating the shell the spiral taper of the projection allows the projection to override first the threads and then the ring encircling the core, but may not override the ring going back.

4. A two piece captive cap as in claim 3, wherein the partial spiral taper on the cap inwardly extending projection is tapered to match the taper on the core threads.

5. A captive movable cap in combination with and mounted to a neck of a container for dispensing contents from the container with the cap sealing in contents when in one position and allowing content removal when in a second position, with the combination comprising: a hollow cylindrical shaped neck on a container having a closed end; a first diameter of the neck contiguous to the container having outwardly extending helical threads around said diameter, and an outwardly extending ring located below the threads and having the side nearest the threads beveled; a second reduced diameter having at least one lateral opening; a beveled surface extending from the reduced diameter to the closed end; a cap sized for mounting on the neck having recessed threads to match the outwardly extending threads on the neck; a beveled surface extending inwardly from the inside to the end of the cap to form an opening at least as large as the end of the neck where its bevel starts; a series of longitudinal slots extending upward from the lower end of the cap; and an inwardly extending projection having a partial spiral taper located near the lower end of the cap to permit the projection to override first the threads then the ring of the core when the cap is rotated.

6. A captive movable cap in combination with a neck of a container as in claim 5, wherein the partial spiral taper on the cap inwardly extending projection is tapered to match the taper on the core threads.

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