Dec. 20, 1960 J. A. PADYKULA 2,965,260

CAPTIVE CAP CONSTRUCTION

Filed Nov. 25, 1958

Fig. 1.

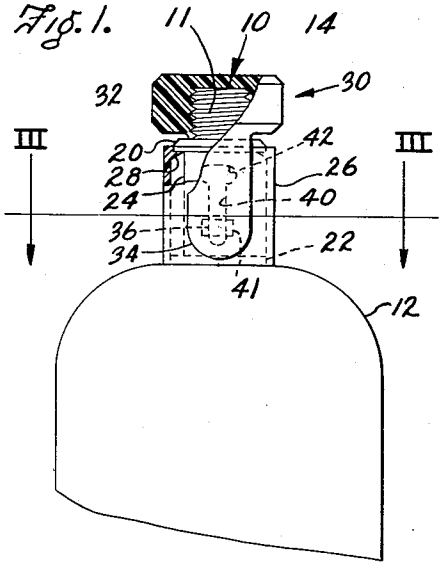


Fig. 2.

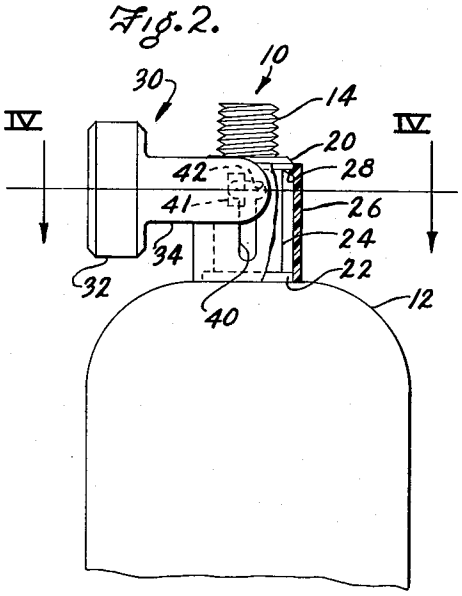


Fig. 3.

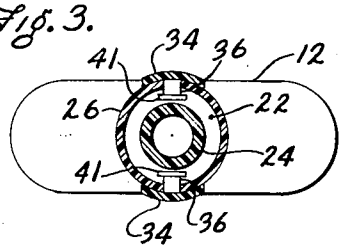


Fig. 4.

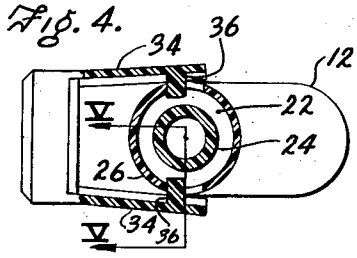


Fig. 5.

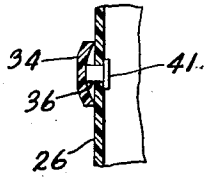
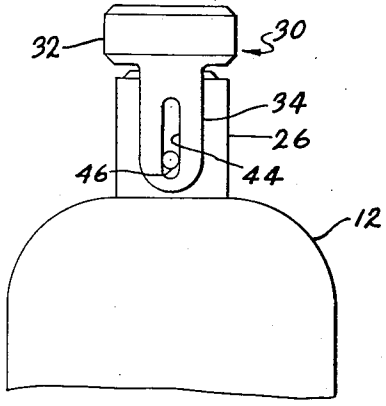


Fig. 6.



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CAPTIVE CAP CONSTRUCTION

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6 Claims. (Cl. 220—30.5)

The present invention relates to improvements in captive container closures and the like and more specifically to closures of the threaded type. The present application is a continuation-in-part of my co-pending application Serial No. 633,424, filed January 10, 1957, now abandoned.

The idea of a captive container closure is, of course, broadly old as may be exemplified by the ordinary water canteen having a screw cap tethered to the neck of the canteen by a bead chain or the like. Over the years various forms of captive closures have been developed as the highly refined state of the patent art will show. In more recent years there has been an ever-growing demand for a captive cap for expendable consumer products such as toothpaste, liquid soap, liquor and many other products. This demand is recognized in U.S. Patent No. 2,588,275 to Nadai, which shows various embodiments of a captive cap which would be suitable for consumer goods which are dispensed from one type of container or another.

In spite of the obvious advantages which can be had from preventing loss or misplacing of the cap and the tremendous competition between manufacturers to offer ever-increasing advantages in the packaging of their products, few, if any, products are today sold in containers having a captive cap.

This situation is, at least in part, due to the failure of prior captive cap devices to provide sufficient convenience and economy even though the field is highly developed, as indicated above. The present invention therefore has for its object to provide a captive closure construction which will be attractive for widespread commercial use by reason of its low manufacturing cost and great convenience in use by the ultimate consumer.

The above and other related objects as well as the novel features of the invention will be apparent from a reading of the following description of the disclosure found in the accompanying drawings and the particular novelty thereof pointed out in the appended claims.

In the drawings:

Fig. 1 is an elevation, partly in section, of the upper end of a container showing the improved captive cap construction of the present invention in its closed position;

Fig. 2 is a view similar to Fig. 1 but with the cap in its open position;

Fig. 3 is a section taken on line III—III in Fig. 1;

Fig. 4 is a section taken on line IV—IV in Fig. 2;

Fig. 5 is a fragmentary section taken on line V—V in Fig. 4; and

Fig. 6 is an elevation of an alternate embodiment of the present invention.

The captive cap construction illustrated in Figs. 1–4 is disposed on the discharge neck 10 of a container 12. The showing of the container 12 is purely for illustrated purposes and could be a toothpaste tube, a can for liquid soap or any other container of the type provided with a discharge neck or pouring spout as indicated in 10 in the drawing. The discharge neck itself, however, is especially adapted for the purposes of the present invention. Specifically the neck 10 has a discharge or filling passageway 11 extending into the container 12 and is provided with threads 14 at its outer end. Beneath the threads 14 is an upper annular rim 20, which is separated from a lower annular rim 22 by a reduced diameter or neck 24.

Rotatably mounted on the spaced bearing points provided by the rims 20, 22 is a sleeve 26 which has inwardly extending projections 28, which engage the lower surface of the rim 20 to prevent axial movement of the sleeve 26 once it has been assembled on the neck 12. More particularly, it will be noted that the lower surfaces of the projections 28 are beveled so that the sleeve 26, which is preferably formed of a resilient plastic material, such as polyethylene or polyvinylchloride, may be telescoped over the neck 10 and brought into the assembled position illustrated. During this telescoping action, the projections 28 will be deflected outwardly to pass over the upper rim 20 and then their upper surfaces will be brought into abutting relation with the lower surface of the rim 20 to prevent removal of the sleeve 26. At this point, it will be noted that the projections 28 may be integrally molded with the sleeve 26, as illustrated, or may be struck from the sleeve material after it has been molded in straight cylindrical form.

A closure member 30 is integrally molded of a resilient plastic material and comprises a cap portion 32 and depending arms 34. The cap portion 32 is provided with a socket for threadably receiving the threaded portion 14 of the neck 10 and thus seal off the container as indicated in Fig. 1. The arms 34 embrace the sleeve 26 and have studs 36 projecting inwardly thereof through a pair of longitudinally extending slots 40 formed in the sleeve 26 (Figs. 1 and 3). The studs 36 may advantageously be provided with heads 41 which are freely received in the annular space between the sleeve 26 and the neck 24. The heads 41 are flattened on their top and bottom sides to have the same dimension as the width of the slot 40 or the same dimension as the height of the cross slots 42 formed at the upper end of the slots 40. At this point it will be noted that the sleeve 26 is thus provided at each side with a T-shaped slot. With this arrangement, it is possible to assemble the closure member 30 on the sleeve 26 by spreading the arms 34 and positioning the studs 36 in the slots 40 or 42 dependent upon the relative position of the arms 34.

It will be further noted (Fig. 3) that the inner surfaces of the arms 34 are formed about a radius matching the radius of curvature of the sleeve 26. This preferred relationship is of importance in maintaining the closure member 30 out of obstructive relation with the discharge spout 10 when a product is being poured from the container, as will now be more clearly described.

When it is desired to open the container, the cap portion 32 may be manually gripped and rotated in the conventional manner. As it is rotated, it is also raised upwardly by the action of the threads 14. The studs 36 freely raise upwardly in the slots 40. When the cap portion 32 is fully disengaged from the threads 14, it may then be swung laterally of the neck 10 about a center defined by the studs 36 to the position illustrated in Fig. 2. It will be noted that the studs 36 have, in Figs. 2 and 4, been shifted to the extreme ends of the cross slots 42.

When the closure member 30 is in this lateral position, the arms 34 are flexed or tensioned as the radial surfaces thereof are cammed outwardly by the surface of the sleeve 26 as is illustrated in Fig. 4. The resilient arms 34 are thus tensioned against the sleeve 26 to provide a force which resiliently maintains the cap in its lateral position out of obstructive relation with the discharge spout so that the product may be freely poured from the container.

It will of course be appreciated that the matching surfaces of the arms 34 and sleeve 26 need not be formed about any particular radius nor in fact do they need to be radially surfaced so long as the arms 34 are cammed outwards as the cap 38 is swung to its lateral position to thereby provide a tension force which will maintain this lateral position.

From Fig. 5 it will be noted that the camming action of the sleeve 26 tends to spread the arms 34 farther outwardly than is permitted by the heads 41 on the studs 36. That is, during the initial swinging movement of the closure member 30 to its lateral position, the arms are flexed outwardly until the heads 41 engage the inner surface of the sleeve 26 adjacent the cross slots 42. Further movement of the closure member 30 tends to flex the arms 34 in a transverse sense as seen in Fig. 5. Thus an even greater gripping force is obtained from the resilient arms 34 to yieldingly maintain the closure member 30 in its lateral position.

Referring now to Fig. 6, there is illustrated an alternate embodiment of the invention in which slots 44 are formed in the arms 34 and receive studs 46 projecting outwardly from either side of the sleeve 26. The slots 44 are merely straight slots instead of the T-slots illustrated in the embodiment of Figs. 1–4. Further, the studs 46 are unheaded. Other than these noted exceptions, the neck 10, sleeve member 26 and closure member 30 are identical to what was described above. The operation of this alternate embodiment is identical to that of the previously described embodiment in that the closure member may be unthreaded from the neck 10 and then swung to a lateral position. Again the arms 34 will be flexed outwardly to grip the sleeve 26 and yieldingly maintain the closure member in its lateral position.

The present invention is capable of variations for various specialized purposes and the scope thereof is to be measured by the following claims.

Having thus described the invention, what is claimed as novel and desired to be secured by Letters Patent of the United States is:

1. In combination with a container, an elongated discharge neck having an opening therethrough and also having a threaded portion formed at its outer end, a first annular rim beneath said threaded portion and a second annular rim spaced therebeneath and separated from the first annular rim by a neck of reduced diameter, a cylindrical sleeve member formed of resilient plastic material rotatably mounted on said neck and journaled on said annular rims, said sleeve having inwardly extending projections engaging the lower surface of said first rim to prevent removal of said sleeve from said neck, said projections having beveled lower surfaces to facilitate assembly of said resilient sleeve by telescoping same over said neck with the projections passing over and beneath said first annular rim, a closure member comprising a cap portion threadably engageable with the threaded portion of said neck in the closed position of said closure member, said closure member further comprising a pair of diametrically opposed arms depending from said cap portion and embracing said sleeve member and a pivotal connection between said sleeve and closure members, said connection comprising diametrically opposed slots formed in one of said members longitudinally of the neck in the closed position of the closure member and a pair of studs projecting from the other of said members and entering said slots whereby the closure member can move axially of the sleeve member as its cap portion is disengaged from the threaded portion of the neck and then the closure member may be swung to a lateral position about an axis transverse to the axis of said discharge neck by means of said pivotal connection.

2. In combination with a container, an elongated discharge neck having an opening therethrough and also having a threaded portion formed at its outer end, a first annular rim beneath said threaded portion and a second annular rim spaced therebetween and separated from the first annular rim by a neck of reduced diameter and a cylindrical sleeve member to which may be secured an auxiliary item to be held in captive fashion on the container, said sleeve member being formed of a resilient plastic material and rotatably mounted on said neck and journalled on said annular rims, said sleeve having inwardly extending projections engaging the lower surface of said first rim to prevent removal of said sleeve from said neck, said projections having beveled lower surfaces to facilitate assembly of said resilient sleeve by telescoping same over said neck with the projections passing over and beneath said annular rim.

3. In combination with a container, an elongated discharge neck having an opening therethrough and a threaded portion at its outer end, a cylindrical sleeve member rotatably mounted on said neck and fixed against axial movement thereon, a closure member formed of resilient material and comprising a cap portion threadably engageable with the threaded portion of said neck in the closed position of the closure member, said closure member further comprising a pair of diametrically opposed arms depending from said cap portion and embracing said sleeve, the inner portions of the arms being in the form of cylindrical sections parallel to said sleeve and generated about radii at least no greater than the radius generating the outer surface of the cylindrical sleeve, and a pivotal connection between said sleeve and closure members, said connection comprising diametrically opposed slots in one of said members disposed longitudinally of the neck in the closed position of the closure member and a pair of studs projecting from the other of said members and entering said slots, whereby the closure member can move axially of the sleeve member as its cap portion is disengaged from the threaded portion of said neck and then the closure member may be swung to any desired lateral position clear of the discharge opening by movement about an axis transverse to the axis of said discharge neck, said sleeve being cylindrical in outline above, below and laterally of said studs whereby the closure member will be maintained in this lateral position by the resilient frictional force of the arms bearing against the sleeve by reason of the arms having been cammed outwardly by the cylindrical surface of the sleeve as the closure member is swung to its lateral position.

4. The combination of claim 3 wherein the studs pass through said slots and are provided with heads at a distance beyond the slots less than the distance which the arms would be cammed outwardly in swinging the closure member to its lateral position whereby a greater resilient force will be provided to maintain said closure member in said lateral position.

5. The combination of claim 3 wherein the surfaces of the arms embracing the sleeve member match the outer surface of the sleeve member in the closed position of the closure member.

6. Closure means for the elongated open-ended neck of a container comprising in combination, said neck extending longitudinally outwardly away from said container and having integral therewith a lower annular ring adjacent said container and an upper annular ring spaced upwardly therefrom disposed intermediate the opposite ends of said neck, an end portion of said neck outwardly of said upper ring being screw threaded for a cap, said lower and upper rings having peripheries of substantially equal diameters which are disposed outwardly around said neck, an elongated tubular sleeve around said neck having a lower portion rotatable on said lower ring and an upper portion provided with circumferentially spaced inwardly extending retaining lips underlying the lower side of said upper ring to prevent accidental axial displacement of said sleeve from said neck, said sleeve and neck arranged to provide an elon-

gated annular space therebetween extending between said lower and upper rings, said sleeve provided with closed T slots on opposite sides thereof having lower elongated portions extending longitudinally thereof and upper side portions extending transversely in opposite directions from the upper ends thereof, a cap having an upper body portion provided with a threaded socket for screwing onto the threaded portion of said neck and having relatively yieldable spaced side arms on opposite sides thereof extending downwardly from said upper portion in parallelism with the longitudinal axis of said socket, said side arms on lower inner ends thereof provided with inwardly extending aligned pins receivable in the T slots of said sleeve, said pins having heads on inner ends thereof extending outwardly from opposite sides thereof transversely relative to the longitudinal axis of the socket in

the cap for disposition in the space between the sleeve and neck at opposite sides of said T slots, said pins being slidable up and down in said T slots with the socket of the cap and threaded portion of the neck in alignment for screwing and unscrewing said cap relative to said neck, and said pins being arranged for sliding and pivoting in the upper side portions of the T slots whereby said cap on being unscrewed from said neck may be swung to a position at a side of said neck.

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