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O. E. BOADWAY
CLOSURE FOR CONTAINER

2,582,224

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2 SHEETS—SHEET 1

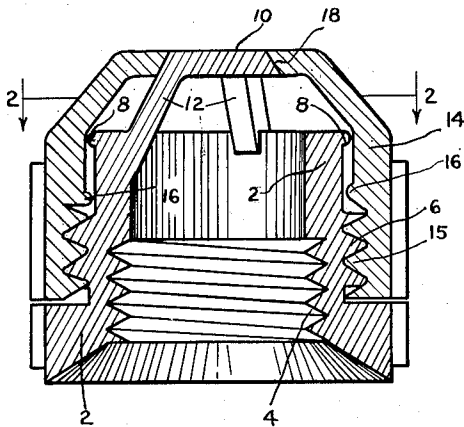


FIG 1

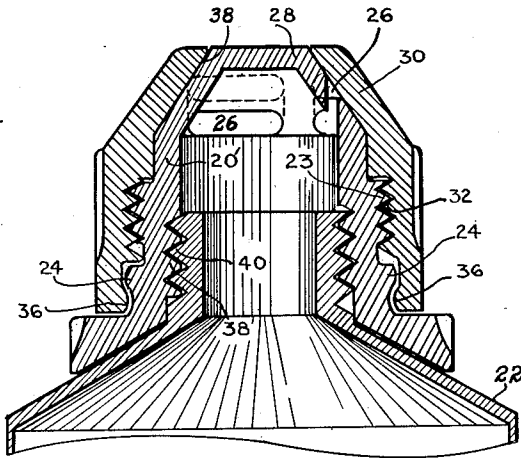


FIG 5

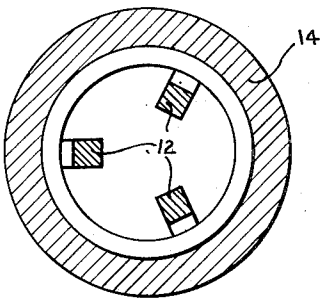


FIG 2

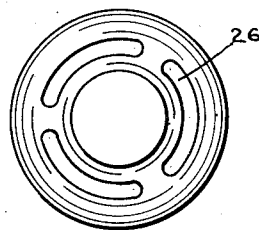


FIG 6

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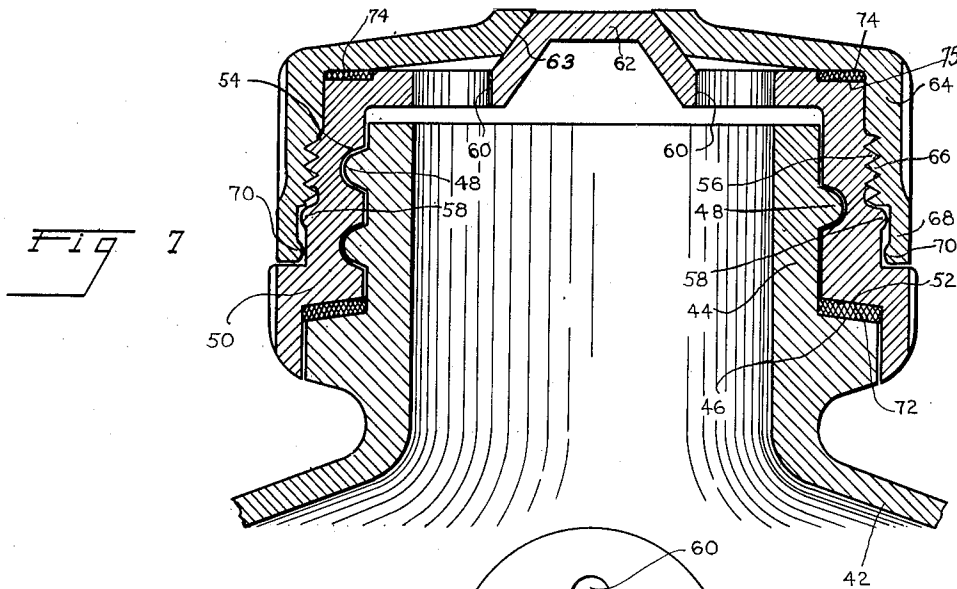
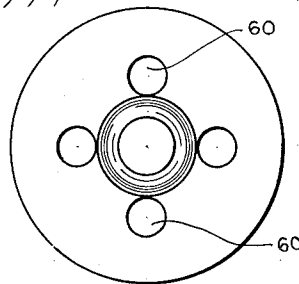
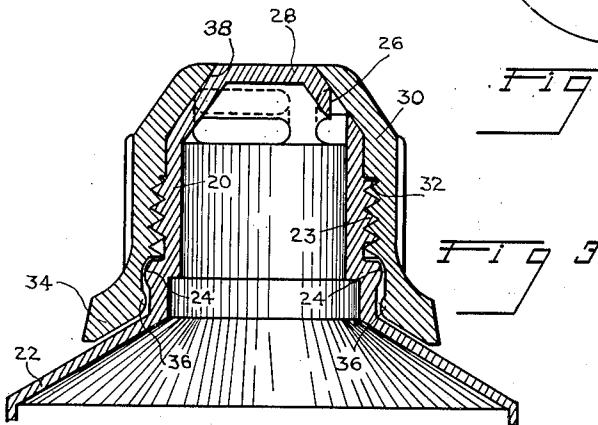
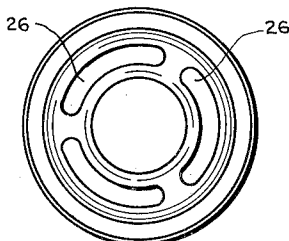
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2 SHEETS—SHEET 2



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UNITED STATES PATENT OFFICE

2,582,224

CLOSURE FOR CONTAINERS

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3 Claims. (Cl. 222—521)

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This invention is a closure for a container, especially for such containers as collapsible tubes and large and small bottles and cans.

The closure is of the captive cap type, wherein the cap is not completely removed, but is rotated a few turns to open and close the discharge opening for the contents. There is, therefore, no possibility of losing the cap.

The principal object of the invention is to provide a captive cap which may be forced or snapped into position on the container, and which, when so positioned, is free to rotate to uncover and cover the discharge apertures, but which cannot normally be removed.

Another object of the invention is to provide a captive cap which can be removed by the application of considerable force, but which normally remains in the captive position.

Another object is to provide a liquid and oil and grease tight closure with a captive cap, wherein the neck of the container may be formed to cooperate with the captive cap, or wherein an adapter neck is used to fit on standard containers, the adapter neck being formed to cooperate with the captive cap. The closure of this invention may therefore be applied to known types of tubes and bottles without modifying them, by use of the adapter neck.

These and other objects are achieved by providing on the container neck or adapter neck an annular locking bead, extending outwardly, and by providing a cooperating annular locking bead on the inside of the captive cap; the outside diameter of the bead on the neck is a little greater than the inside diameter of the bead on the cap, so that one bead cannot get past the other without being forced past. However, the cap is made of a material, such as plastic or metal, having some elasticity, whereby, upon the application of a fair amount of force, the bead on the cap snaps over the bead on the neck and so normally locks the cap in place. The neck and cap have cooperating screw threads, so that after the cap has been snapped into position, it may still be rotated to cover and uncover discharge apertures in the neck portion. While the cap is not intended to be removed, when once in place, still it can be removed by the use of some force, to snap the bead on the cap over the bead on the neck, to release the cap, for cleaning, replacement, etc.

Further objects and advantages will be developed in connection with the accompanying drawings, illustrating several ways of carrying out the invention.

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In these drawings:

Fig. 1 is a vertical cross section of one form of closure in accordance with this invention;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a vertical cross section of another form of closure;

Fig. 4 is a top plan view of part of Fig. 3, with the cap removed;

Fig. 5 is a vertical cross section of another form of the invention, using an adapter neck;

Fig. 6 is a top plan view of part of Fig. 5, with the cap removed;

Fig. 7 is a vertical cross section of another form of the invention, particularly for bottles and having an adapter neck; and

Fig. 8 is a plan view, on a reduced scale, of the central part of Fig. 7.

Referring now to these drawings, 2 shows the neck portion of the closure, which could be formed as part of a container, such as a collapsible tube, but here shown as an adapter neck provided with internal threads 4 to engage the usual threads on the tube. The neck 2 is provided with exterior screw threads 6, and as an important feature, with an annular, outwardly extending integral locking bead 8, well above the screw threads 6. The upper part of the neck portion 2 is provided with a closure plug 10 supported by legs 12, the spaces between the legs providing discharge apertures.

Cooperating with the neck 2 is a captive cap 14, having threads 15 cooperating with threads 6 and provided with an annular, inwardly extending integral locking bead 16 having an internal diameter a little greater than the external diameter of bead 8. Cap 14 is made of material having some elasticity, such as plastic, metal or wood, so that, by the use of a fair amount of force, the bead 16 can be forced against bead 8 until it snaps over 8, the threads 15 previously having been threaded over and past head 8.

The captive cap 14 is provided with a central discharge aperture 18, controlled by closure plug 10.

When the cap is applied, as in Fig. 1, the cap may be rotated to raise and lower it and so to open and close discharge aperture 18. The cap, however, cannot readily be removed, because the bead 16 cannot get past bead 8, and so loss of the cap is prevented. However, by the use of sufficient force, the bead 16 can be forced over and past bead 8 and so the cap can be removed, for cleaning the discharge openings or for replacement.

In the form of the invention shown in Fig. 3,

the neck 20 is formed as part of the container 22. The neck is exteriorly threaded at 23 and is provided, below the threads, with an outwardly extending, annular locking bead 24. The upper part of the neck is provided with a tapered top having discharge apertures 26 therein and formed into a closure plug 28. Where a liquid is being dispensed, the liquid will flow out of one of the apertures 26, and air will flow into the container through the other two apertures 26, giving a smooth, uninterrupted flow of liquid.

The cap 30 is interiorly threaded at 32 and is provided, in the flared skirt portion 34, with an inwardly extending annular bead 36, having an internal diameter a little smaller than the external diameter of the locking bead 24. Cap 30 is provided with a tapered top and a central discharge aperture 38 controlled by closure 28.

The cap 30 is made of material having some elasticity, such as plastic, metal or wood. In use, the cap is placed over the neck and a twisting force applied, which will force bead 36 to snap over bead 24 and so lock the cap in place. The fact that the bead 36 is near the lower edge of the cap facilitates the slight expansion necessary to accomplish this. Part 34, however, is sufficiently rigid so that the cap cannot be removed except by the use of considerable force to carry bead 36 over bead 24.

In the form of invention shown in Figs. 5 and 6, the formation of the cap and neck portions is substantially the same as in Fig. 3 and parts are correspondingly numbered. Neck portion 20', however, instead of being formed as a part of the receptacle, as in Fig. 3, is formed as an adapter neck and is interiorly threaded at 38 to cooperate with external threads 40 on the container. Where a liquid is being dispensed, the liquid will flow out of one of the apertures 26, and air will flow into the container through the other two apertures 26, giving a smooth, uninterrupted flow of liquid.

In the form of the invention shown in Figs. 7 and 8, the container 42 is provided with a neck portion 44 having a shoulder 46 and external threads 48. An adapter neck 50, provided with a shoulder 52 and internal threads 54, is exteriorly threaded at 56 and is provided, below the threads, with an outwardly extending, integral, annular locking bead 58. The upper part of the adapter neck is provided with discharge apertures 60 and with a tapered closure plug 62. Where a liquid is being dispensed, the liquid will flow out of one or two of the apertures 60, and air will flow into the container through the other apertures 60, giving a smooth, uninterrupted flow of liquid.

Cap 64, provided with a central discharge aperture 63 controlled by plug 62, is provided with interior threads 66 engageable with threads 56. Below the threads, the cap is provided, within a skirt portion 68, with an integral, annular, inwardly extending locking bead 70, having an inner diameter a little greater than the outer diameter of bead 58. Cap 64 is of material having some elasticity, and the locking bead 70 is forced past locking bead 58 in assembling and disassembling the cap, as already described. The elasticity afforded by skirt 68 facilitates this attachment and detachment of the captive cap 64.

A sealing gasket 72 may be positioned between

shoulders 46 and 52, and a sealing gasket 74 may be positioned on the upper, outer part of the adapter neck, preferably in an annular seat 75, for more effectively sealing the receptacle. In order to increase the sealing effect of gasket 72, this gasket is preferably of a sticky nature, for holding neck 50 more or less permanently in place.

There has thus been provided a captive cap which is normally secured against removal, but which, by virtue of the locking beads, can be forced into place, and removed, if necessary, by the application of sufficient force. The invention is applicable to standard containers by the use of the adapter neck, or the container may be provided with the locking bead when it is made.

While several ways of carrying out the invention have been described in some detail, it should be understood that the invention is not limited to these details, but may be carried out in other ways.

I claim as my invention:

1. A closure for a container, comprising a neck having top discharge apertures and a top central closure plug, and provided with integral exterior screw threads and with an annular integral rounded locking bead on the outer portion of the neck, spaced downwardly from said exterior screw threads, a captive cap provided with a central discharge aperture cooperating with the closure plug on the cap and provided with interior integral screw threads adapted to cooperate with the exterior threads on the neck, said cap being further provided with an annular integral rounded bead spaced downwardly from its interior screw threads, the inner diameter of the annular bead on the cap being smaller than the outer diameter of the annular bead on the neck, the cap being made of resilient material whereby the cap may be applied by forcing the bead on the cap to snap past the bead on the neck, said beads then cooperating to prevent removal of the cap.

2. The combination as set forth in claim 1, wherein said neck is provided with interior screw threads adapted to cooperate with corresponding threads on a container, to thereby serve as an adapter.

3. The combination as set forth in claim 1, wherein said neck is provided with an interior annular shoulder, adapted to serve as a seat for a gasket.

ODBER E. BOADWAY.

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