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2,591,231

SEALING AND DISPENSING CLOSURE FOR CONTAINER NECKS

Filed April 24, 1947

2 SHEETS—SHEET 1

Fig. 1

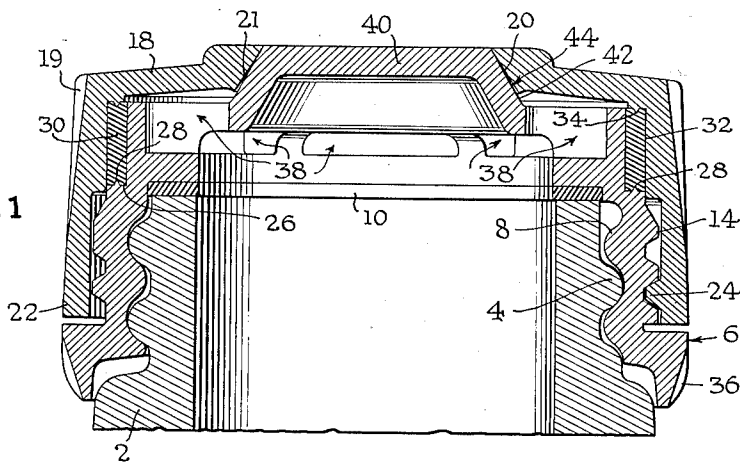


Fig. 2

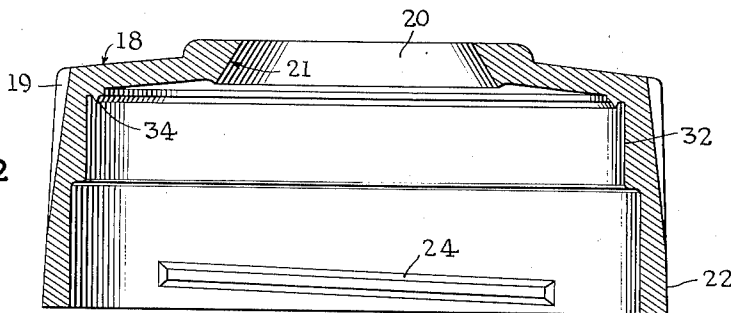
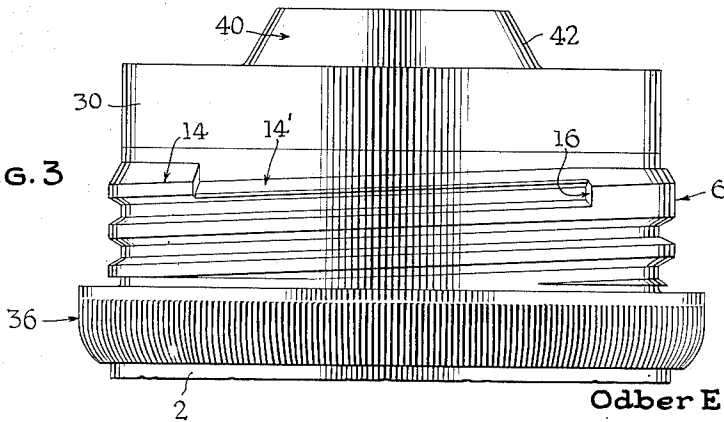


Fig. 3



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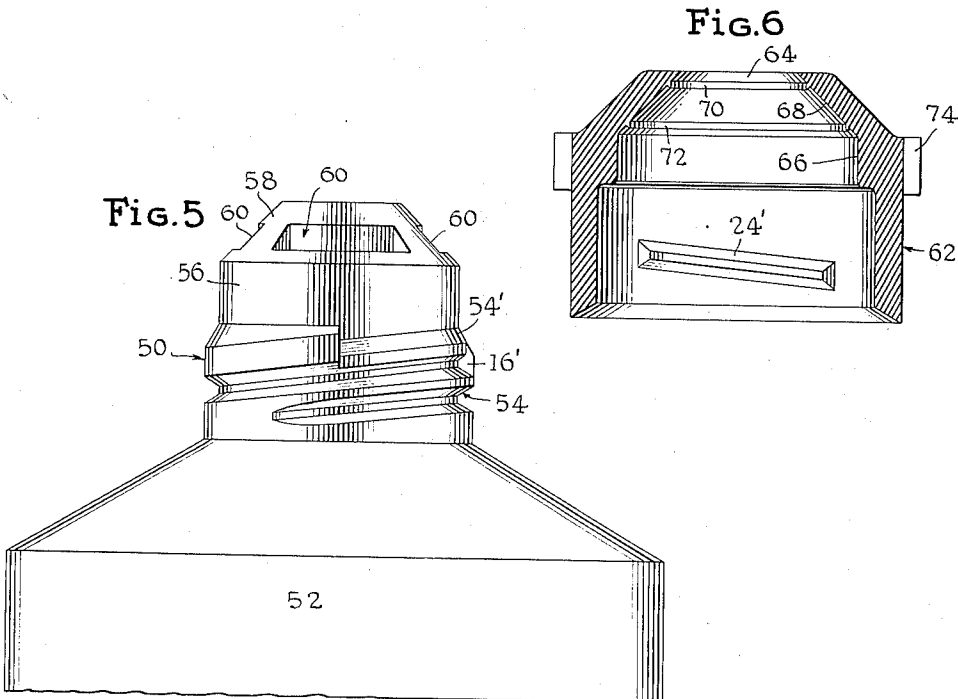
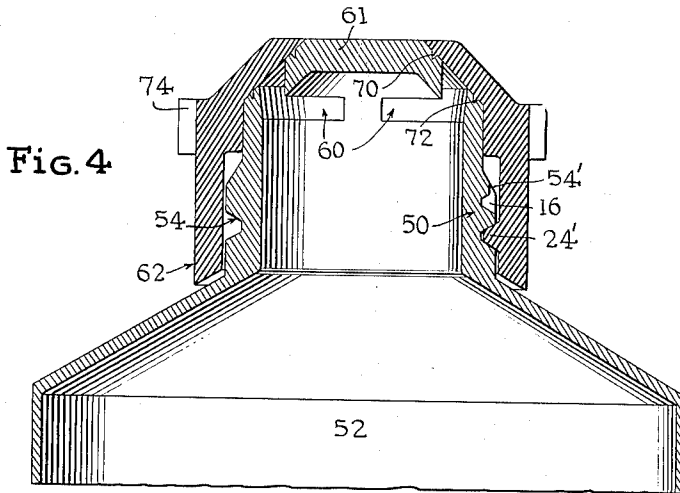
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2 SHEETS—SHEET 2



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2,591,231

SEALING AND DISPENSING CLOSURE FOR
CONTAINER NECKSOder E. Boadway, Pasadena, Calif., assignor to
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3 Claims. (Cl. 222-521)

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This invention is a closure for containers, such for example, as collapsible tubes, bottles, jars, cans, and the like.

The invention is a modification of and an improvement on the closure for containers shown in my application Ser. No. 643,869, filed January 28, 1946, now Patent No. 2,582,224, issued January 15, 1952.

The closure of the present invention is of the captive cap type, that is to say, of the type where the cap is rotated a turn or two to the open or closed position, but is not completely removable, thereby preventing the loss of the cap.

The neck portion of the present closure may be formed as part of the container itself; however, the neck portion of the closure may be formed separately and provided with interior threads for engaging with exterior threads on the container, whereby the closure of the invention is applicable to already existing types of tubes, bottles, and cans.

The principal object of the present invention is to provide a closure wherein the neck portion is provided with exterior threads, the upper end of which terminates in a limiting abutment and wherein the cap, which is provided with an interrupted thread or long inclined lug, is forced over the uppermost edge of the thread and snaps into engagement with the thread; when so engaged, the cap may be rotated to move it to open or closed position, but when the cap is moved to the open position, the interrupted thread or inclined lug will engage against this limiting abutment for preventing any further rotation, thereby preventing the removal of the cap, so that it cannot be lost.

Another object of the invention is to provide an improved seal between the upper part of the neck and the closure cap. This improved seal comprises an annular gasket carried by the upper part of the neck. The shoulder on which the gasket is seated and the inside upper part of a cap are each provided with an annular knife edge, which knife edges, when the cap is screwed to closed position, bite into the lower and upper edges of said gasket for making a very tight seal.

The closure of this invention is adapted to be used on containers for tooth paste, shaving cream, cosmetic creams, medicines, liquids generally, oily and fatty materials, liquid shoe polish, paints and pigments, glue, adhesives, and the like.

Further advantages of structure and operation are now to be described in connection with the accompanying drawings wherein:

Fig. 1 is a vertical cross section of one form of the closure of the present invention, in closed position.

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Fig. 2 is a sectional view of the closure cap.

Fig. 3 is a side view of the parts shown in Fig. 1.

Fig. 4 is a vertical section of a modification wherein the cap is threaded directly onto the neck of the container.

Fig. 5 is a side elevation of the top part of the container of Fig. 4.

Fig. 6 is a vertical section of the closure cap of Fig. 4.

Referring now to these drawings, 2 indicates the neck portion of a collapsible tube, bottle, can, or the like, provided with exterior screw threads 4. The neck portion or member of the closure, indicated generally at 6, which also functions as an adapter, is provided with interior screw threads 8 engageable with the exterior threads 4 on the container. Neck 6 could be formed as an integral part of container 2, as in Fig. 4, in which case interior threads 8 would not be used. The neck portion 6, if not integral with the container, is preferably permanently secured to the neck 2 thereof by cementing it directly thereto. However, it is preferred that an annular gasket 10, seated on the upper edge of the neck 2 of the container, be bonded or cemented to the upper edge 2 and to the annular portion 12 of the neck 6.

The neck portion 6 is provided with single or double exterior screw threads 14, such threads not running all the way to the top as usual, but terminating in a limiting abutment 16.

Cooperating with the parts just described is a cap 18 provided with finger corrugations 19 and with a central dispensing aperture 20, having an inclined surface 21. The lower or skirt portion 22 of the cap is provided with an inwardly projecting interrupted thread or inclined lug 24. The cap 18 is preferably made of plastic or of a material having some resiliency, and the cap is engaged with the neck by forcing the interrupted thread 24 over the upper edge of the topmost thread 14, shown at 14', whereby the lug will snap into the thread 14. Once in the thread 14, it will ride therein as the cap is rotated to move it to open or closed positions but further rotational movement after reaching the open position is prevented by the lug or thread 24 engaging against the limiting abutment 16, thereby preventing removal of the cap.

In order to prevent any sidewise leakage of the contents, the cap member 6 is provided with an inset annular shoulder 26 and positioned on this shoulder is the upwardly extending knife edge 28. Seated on shoulder 26 is a vertically disposed annular gasket 30, of a thickness adapted to engage snugly against the interior upper surface 32 of the cap. The under, outer

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portion of the cap is provided with an annular knife edge 34. The snug engagement between the gasket 30 and the surface 32 of the cap, together with the sealing effect, achieved by knife edges 34 and 28 biting into the upper and lower edges of the gasket, form an effective seal against leakage of the contents, serving especially to prevent the escape of the contents onto the exterior screw threads 14.

The neck member 6 is provided with corrugations 36, useful in rotating it, in case its removal is desired. The neck member 6 is also provided with dispensing apertures 38 and with a beveled plug 40, for closing aperture 20 in the cap. Beveled surface 42 of the neck and beveled surface 21 of the cap are at somewhat different angles, forming a wedgelike space 44, the result of such construction being a sharper line of contact between the upper portion of the beveled surfaces.

In that form of the invention shown in Figs. 4, 5 and 6, the neck portion of the container is formed with special threads, with which a somewhat modified type of cap cooperates. It should be understood, as already noted, that with the form of invention shown in Fig. 1, the threads 14 could be formed directly on the neck of the container; and also that the modified form of neck, dispensing openings and cap, now to be described in connection with Figs. 4, 5 and 6, could also be used with the type of closure shown in Figs. 1, 2 and 3.

Referring now to Figs. 4, 5 and 6, the neck 50 of container 52, shown as a collapsible tube, is provided with external threads 54, generally similar to threads 14 of Fig. 1. The upper part of the thread is cut away, to leave an inclined edge 54'; positioned at the upper or right hand end of edge 54' is a limiting abutment 16', analogous to limiting abutment 16.

The neck 50, above the threads, is cylindrical, as at 56. The frustro-conical top 58 is provided with escape apertures 60, and has a solid top 61.

The cap 62 is provided on its interior, lower portion with an inclined interrupted thread 24', analogous to interrupted thread 24 of Fig. 2. The cap is engaged with the neck by forcing the interrupted thread 24' over edge 54', the cap being somewhat resilient and so permitting this. The cap is thus threadably engaged with the neck 24' moving in thread 54. The opening movement, however, is limited, by the upper end of 24' engaging abutment 16'. This movement is of course sufficient to clear apertures 60 so that the paste or the like is dispensed through the central aperture 64 in the cap.

The interior of the cap is provided with a cylindrical wall 66 which slidably and snugly engages surface 56 of the neck. The inner, upper surface 68 is of frustro-conical shape and such surface is provided with upper and lower annular knife edges 70 and 72, which bite against the conical surface 58, above and below apertures 60, respectively, thus providing an effective seal. The snug fit of surfaces 66 and 56 and the lower knife edge 72 keep dispensed material from the threads. The cap may be provided with serrations 74 for use in opening and closing the cap.

In operation, the cap is opened or closed by turning in the usual way. However, the turning movement is limited by 24' engaging abutment 16', in which position the apertures 60 and 64 are clear. The cap cannot be removed, however, because 24' has been snapped over edge 54'.

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The parts described may be made of any desired materials, such, for example, as metal or plastic.

The closure of the invention is of simple and sturdy construction, susceptible of quantity production and provides an effective closure for use with containers for liquids, pastes, oils, and the like. Once the cap is forced into engagement with the exterior screw threads on the neck, it cannot be removed and so loss of the cap is effectively prevented. The closure may be applied to standard containers, as in Fig. 1, or the container may be modified, as in Figs. 4 and 5. In both forms, leakage of the contents is effectively prevented.

While the invention has been described in some detail, it should be understood that the invention is not to be limited to the precise details illustrated, but may be carried out in other ways.

I claim as my invention:

1. A closure for a container, comprising a neck portion having an exterior screw thread thereon, said screw thread being cut out near the top thereof for a substantial distance, such cut out providing an arcuate notch, extending for a substantial distance around the exterior of the neck, one end of said notch being formed into an abutment, a cap having no threads on the interior thereof, and provided on the interior thereof of only with an inclined arcuate lug, extending for a substantial distance around the interior of the cap, said lug being adapted to pass through said cut out in the thread and into operative engagement with the root of the thread just below the cut out, whereby the rotational movement of the cap toward the open position is limited by the upper end of said inclined lug coming into engagement with said abutment, the cap being provided with a central outlet, and a centrally positioned plug carried by the neck, cooperating with said central outlet in the cap.

2. The combination as set forth in claim 1, said neck portion being provided with an interior screw thread for engagement with an exterior screw thread on a container, to serve as an adapter neck.

3. The combination as set forth in claim 1, wherein the upper, outer portion of said neck is provided with an annular shoulder, and an annular gasket seated on said shoulder, in sealing engagement with the upper, inner wall of said cap.

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