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3,265,233

CONTAINER AND SAFETY CLOSURE CONSTRUCTION

Filed Oct. 5, 1964

FIG. 1

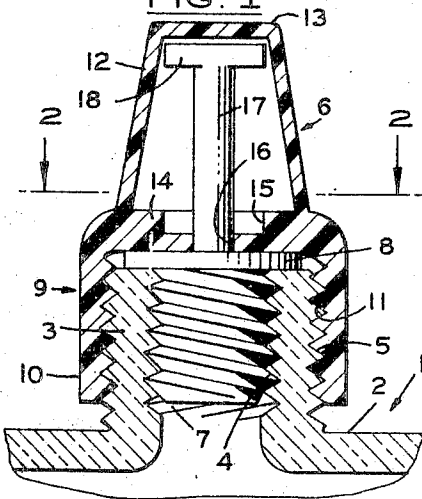


FIG. 2

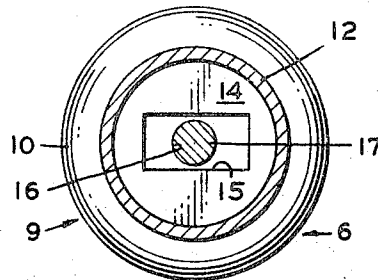


FIG. 3

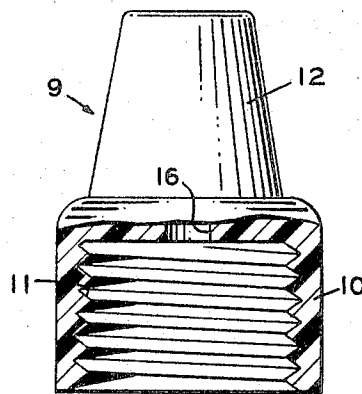


FIG. 5

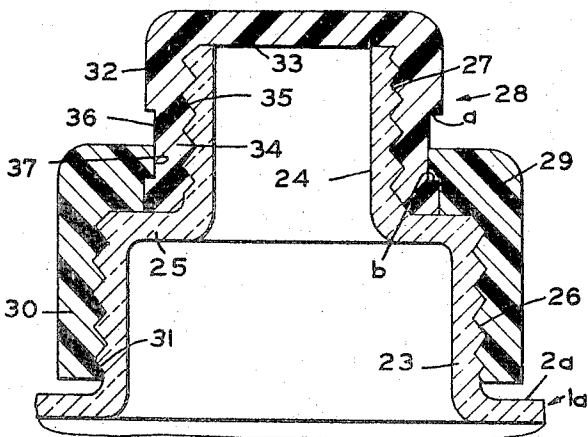


FIG. 4

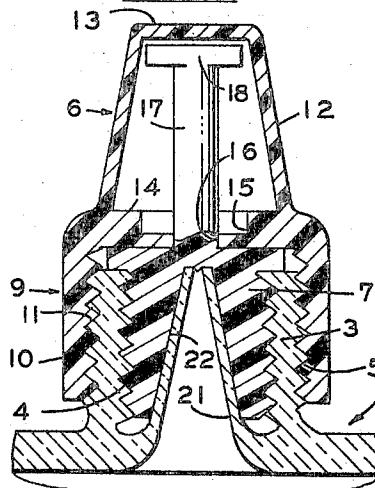
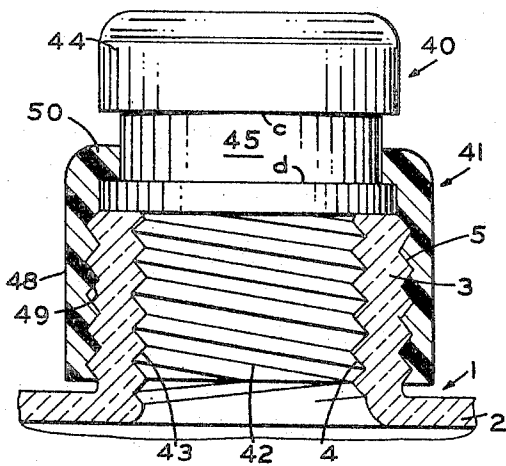


FIG. 6



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3,265,233 CONTAINER AND SAFETY CLOSURE CONSTRUCTION

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This invention relates to container and safety closure constructions of the kind adapted to prevent access to the container contents by children, and more particularly the invention pertains to the provision of safety closures for containers terminating at one end in a threaded neck or discharge opening.

An object of this invention is to provide a safety closure for containers and wherein access to the contents of such containers necessitates manipulation of the closure in a predetermined manner.

Another object of the invention is to provide a container and safety closure construction wherein removal of the closure from the container requires sequential rotation in opposite directions of a number of elements comprising the closure.

A further object of the invention is to provide a construction of the kind referred to wherein removal of the closure requires a combination of rotary and axial movements to be imparted to the closure.

Another object of the invention is to provide a safety closure for a container and wherein the closure lends itself to mass production techniques for purposes of economy.

Other objects and advantages of the invention will be pointed out specifically or will become apparent from the following description when it is considered in conjunction with the appended claims and the accompanying drawings, in which:

FIGURE 1 is a vertical sectional view illustrating the neck of a container to which is attached a safety closure constructed in accordance with one embodiment of the invention;

FIGURE 2 is a cross-sectional view taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a view partly in section and partly in elevation of a portion of the closure member illustrated in FIGURE 1;

FIGURE 4 is a view similar to FIGURE 1, but illustrating a modified form of closure attached to a different kind of container;

FIGURE 5 is a view similar to FIGURE 1, but illustrating a further modified closure and container; and

FIGURE 6 is a view similar to FIGURE 5, but illustrating still another embodiment of the invention.

The construction shown in FIGURES 1, 2 and 3 comprises a hollow container 1 having walls 2 formed of glass, metal, or any suitable plastic material, such as polyethylene, and terminating at one end in an open end, annular neck 3 having discrete internal and external helically threaded areas 4 and 5, respectively. Preferably, the hand of the internal thread 4 is opposite to the hand of the external thread 5. That is, the thread 4 may be left hand and the thread 5 right hand, or vice versa.

A safety closure member designated generally by the reference character 6 comprises a first, or radially inner, generally cylindrical element or plug 7 which is exteriorly threaded as at 7a to correspond to the threads 4 for threaded engagement therewith. The outer end of the plug 7 is provided with a flange 8 that is adapted to overlie and bear against the terminal end of the neck 3 to seal the latter. Enclosing the inner closure element 7 is a radially outer closure element 9 having an

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annular skirt portion 10 which is interiorly threaded as at 11 to correspond to the hand of the threads 5 for threaded engagement therewith.

Secured to and projecting axially from the skirt 10 is a hollow bell or housing 12. One end of the bell 12 terminates in a closed end wall 13, the other end of the bell terminating in a partition 14 in which is formed a generally rectangular clutch socket or slot 15. The partition also is provided with a centrally located opening 16 which extends from the base of the socket 15 completely through the partition wall.

Means for connecting the inner and outer closure members to one another comprises an elongated rod 17 that is axially slideable in the opening 16. One end of the rod 17 is fixed to the flange 8, and the other end of the rod has secured thereto a generally rectangular clutch or driving member 18 which is adapted removably to be seated in the socket 15.

The construction of the container and closure is such that when they are assembled in the manner shown in FIGURE 1 the outer closure member 9 must be rotated independently of the inner closure member 7 until such time as the threads 10 disengage the threads 5. Mere disengagement of the threads 5 and 11, however, is not sufficient to enable removal of the inner closure member 7. It first is necessary to engage the clutch parts 15 and 18 by seating the latter in the socket 15. Upon engagement of the clutch parts, rotation of the outer member 9 then will be imparted to the inner closure member 7 so as to enable the latter to be extracted from the neck 3. Due to the opposite hands of the threads of the inner member and its associated neck threads 4, however, it is essential that the outer member 9 be rotated in a direction opposite to that in which it was rotated to effect its disengagement from the associated neck threads 5.

When it is desired to return the closure member 6 to the container 1, the procedure described for removing the closure must be reversed, as will be understood.

The embodiment of the invention disclosed in FIGURE 4 is similar in many respects to the embodiment just described, and parts which are similar are given similar reference characters. The principal differences between the two embodiments is that in FIGURE 4 the container 1 includes a hollow, generally frusto-conical, upstanding spout 21 which is surrounded by the neck 3, and the inner closure member or plug 7 is provided with an opening 22 in which the spout 21 may be accommodated. The construction disclosed in FIGURE 4 is particularly suited for use with liquids and permits the liquid to be dispensed from the spout 21 without engaging the threads 4.

The embodiment shown in FIGURE 5 comprises a container 1a having a top wall 2a that terminates in a first annular neck portion 23 and a second annular neck portion 24 in axial prolongation thereof. The neck portion 23 is of larger diameter than the neck portion 24 and an annular shoulder 25 separates the two neck portions. The neck 23 is externally threaded as at 26, and the neck 24 also is externally threaded as at 27. The hands of the threads 26 and 27 preferably are opposite.

A closure 28 for the container 1a comprises an annular closure member 29 having a skirt portion 30 that is internally threaded as at 31 for threaded engagement with the threads 26. Rotatably and axially movable in the member 29 is a second closure member 32 having a sealing wall 33 at one end from which depends a skirt portion 34 that is internally threaded as at 35 for threaded engagement with the threads 27. The outer surface of the skirt 34 is provided with an annular groove 36 having side walls or flanges a and b and in which is received

a flange or shoulder 37 formed on the closure member 29.

To remove the closure 28 from the container 1a, it is necessary to rotate the member 29 in such direction as to cause it to move axially toward the open end of the neck portion 24. As is indicated in FIGURE 5, the width of the groove 36 is greater than the axial length of the shoulder 37. Consequently, the member 29 is capable of axial movement relative to the member 32. However, the axial length of the threads 26 and 31 is greater than the width of the groove 36. Accordingly, before the threads of the closure member 29 disengage the threads of the neck portion 23, the flange 37 will engage the outer wall a of the groove 36 and preclude further axial movement of the member 29. Upon engagement of the shoulder 37 with the wall a of the groove 36, the inner closure member 32 may be rotated relatively to the outer member 29 and to the neck portion 24 so as to effect outer axial movement of the inner closure member. Due to the opposite hand of the threads 27 and 35, as compared to the hands of the threads 26 and 31, the member 32 must be rotated in a different direction than the outer member 29 was rotated. Such rotation of the inner member 32 may continue until the shoulder 37 engages the inner wall b of the groove 36, whereupon the outer member 29 then must be rotated relatively to the neck 23 and to the member 32. This procedure may be repeated as long as is necessary to effect removal of the closure 28 from the container 1a.

To return the closure 28 to the container 1a, either of the members 29 or 32 initially may be engaged with the threads of its associated neck portion. Thereafter, the members 29 and 32 will be rotated sequentially so as to effect incremental movement of the respective members to their container sealing positions.

The embodiment of the invention shown in FIGURE 6 utilizes the container 1, an inner closure member 40 and an outer closure member 41, the outer member 41 being movable rotatably and axially relatively to the member 40. The inner closure member comprises a cylindrical plug 42 that is threaded as at 43 to correspond to the interior thread 4 of the neck 3. Fixed to one end of the plug 42 is a sealing cap 44 having an annular groove 45 therein defined by parallel flanges or walls c and d.

The outer closure member 41 includes an annular skirt 48 that is interiorly threaded as at 49 to correspond to the threads 5 of the neck 3. The outer closure 41 rotatably receives the inner member 40 and is provided with a flange 50 that is accommodated in the groove 45. The threads 42 and 49 of the inner and outer members, respectively, are of opposite hand so as to correspond to the threads 4 and 5 of the neck 3.

The operation of the apparatus shown in FIGURE 6 is similar to the operation of the FIGURE 5 construction in that removal of the closure member 40 requires sequential and opposite rotation of the members 41 and 44. The sequential movement is necessary inasmuch as the width of the groove 45 is less than the axial length of the threads 49. Opposite rotation of the members 41 and 44 is necessitated by reason of the opposite hands of the threads of the respective members and their associated neck portions.

The disclosed embodiments are representative of pres-

ently preferred forms of the invention, but are intended to be illustrative rather than definitive thereof. The invention is defined in the claims.

I claim:

1. A safety closure for a container having a tubular neck provided with two discrete threaded areas, one of which is located radially inwardly of the other, said closure comprising a first cap element having a threaded portion adapted for threaded engagement with the radially inner threaded area of said neck; a second cap element mounted on said first cap element for rotation and axial movement relative to said first cap element, said second cap element substantially wholly enclosing said first cap element and having a threaded portion adapted for threaded engagement with the radially outer threaded area of said neck; and engageable and disengageable means on said cap elements engageable when the latter are in but one position of relative axial adjustment to prevent relative rotation thereof.

2. The construction set forth in claim 1 wherein the thread hands of said threaded portions of said first and second cap elements are opposite.

3. A container and safety closure construction comprising a container terminating at one end in an annular, open end neck threaded internally and externally; an inner closure element removably received within said neck and in threaded engagement with the internal threads thereof; an outer closure element mounted on said inner closure element for rotation and axial movement relative to said inner closure element, said outer closure element enclosing said inner closure element and having an annular, internally threaded skirt portion removably receiving said neck and in threaded engagement with the external threads thereof; cooperable means on said inner and outer closure elements and engageable in response to limited relative axial movement of said elements to disable further relative axial movement thereof; and engageable and disengageable clutch means on said inner and outer closure elements engageable in but one relative position of axial adjustment of said closure elements to disable relative rotation of said members.

4. The construction set forth in claim 3 wherein said container includes a spout located radially inwardly of said neck, and wherein said inner closure element has an opening therein to accommodate said spout.

5. The construction set forth in claim 3 wherein the hands of the threads of said neck are opposite and wherein the hands of the threads of the closure members correspond to the hands of the respective neck threads.

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