

[54] SINGLE USE SAFETY CLOSURE

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215/274; 215/330

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[58] Field of Search 215/216, 220, 221, 252,
215/253, 272, 274, 330

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Primary Examiner—Donald F. Norton

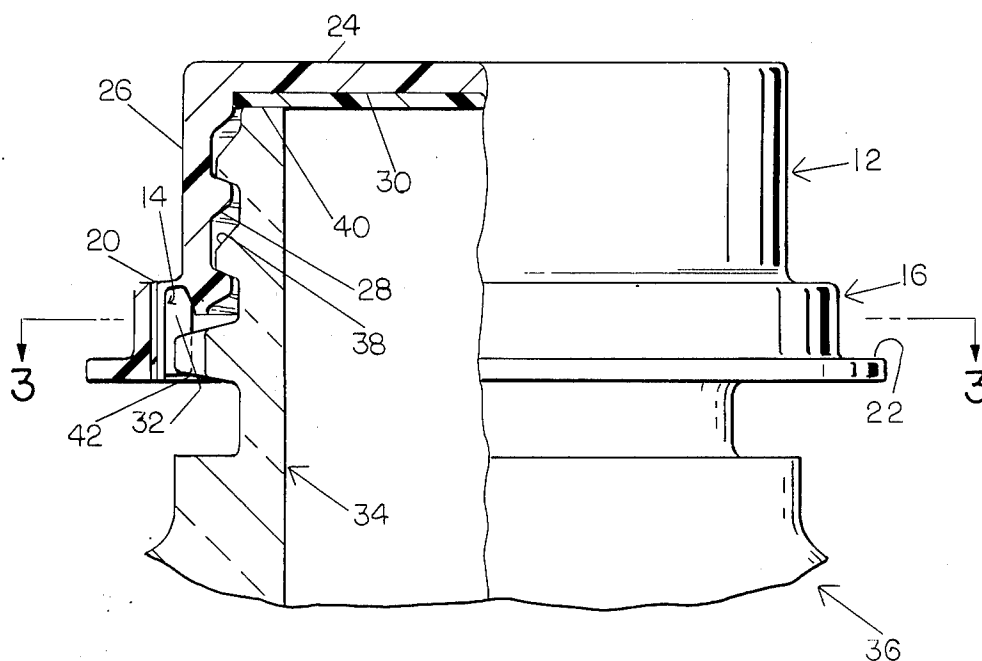
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[57]

ABSTRACT

A safety closure particularly adapted for single use containers. The safety closure includes an internally threaded main body. A flexible skirt is attached to the lower portion of the main body by a flexible circumferential ring. The skirt includes a plurality of inwardly directed interior projections. An annular locking ring is molded as a part of the closure, the locking ring being formed below the skirt and attached thereto by frangible ribs. In use, the locking ring is pushed upward to surround the skirt, fracturing the frangible ribs in the process. When the closure is placed on a container with the locking ring in place, the projections on the skirt will cooperate with external projections on the container finish to define a one-way ratchet drive. So long as the locking ring remains in place, the closure cannot be removed. When the locking ring is pushed off of the skirt, the skirt can flex sufficiently to allow disengagement of the one-way ratchet drive, thus allowing removal of the closure from the container.

3 Claims, 4 Drawing Figures



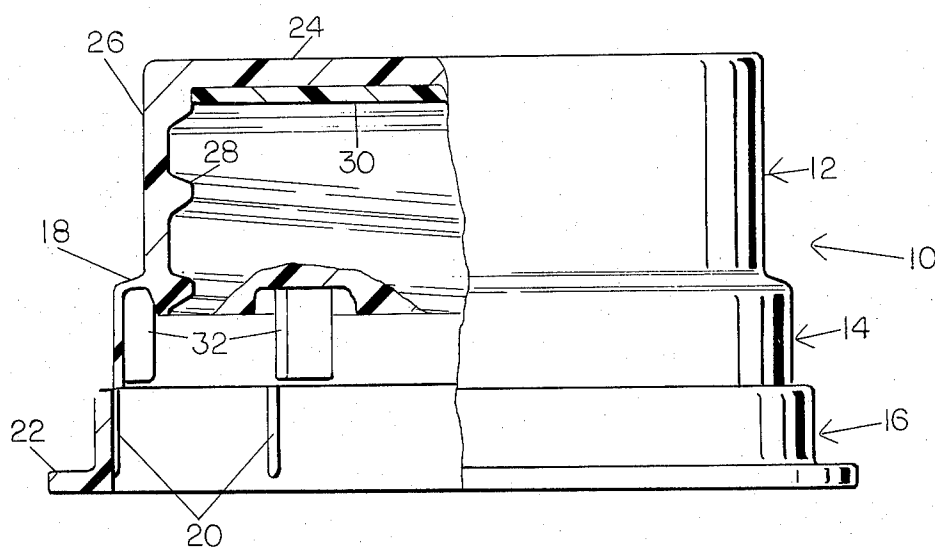


FIG. 1

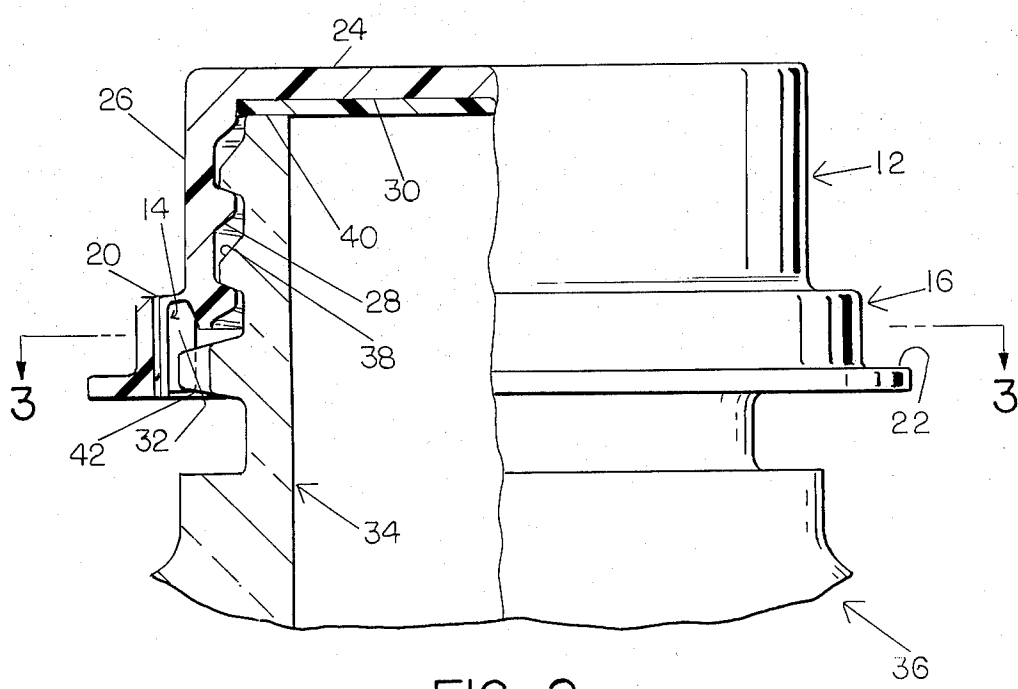


FIG. 2

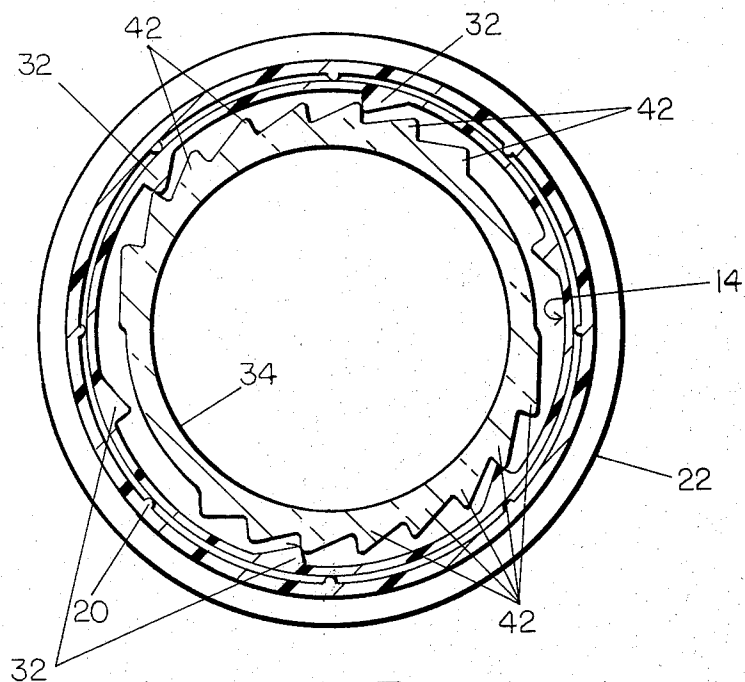


FIG. 3

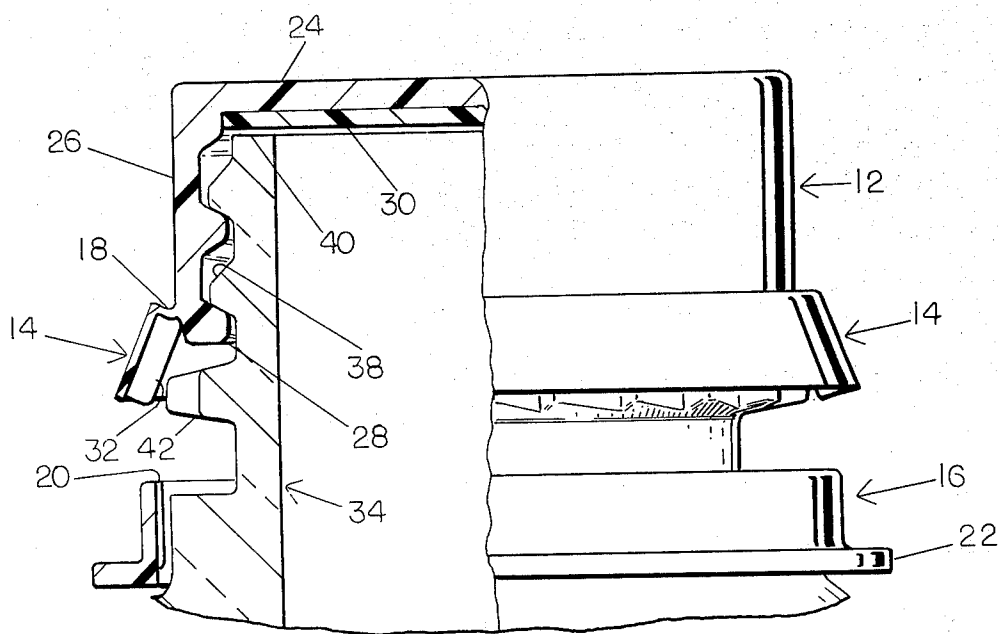


FIG. 4

SINGLE USE SAFETY CLOSURE

BACKGROUND OF THE INVENTION

This invention generally relates to safety closures for containers. More specifically, this invention relates to a safety closure designed for use with a single unit of use container. Most particularly, this invention relates to a safety closure of the class described wherein a locking ring prevents over-riding of a one-way ratchet drive until use of the container contents is desired.

Safety closures for containers have become an important item of commerce. Such closures are designed to prevent children from gaining unauthorized access to containers, thus significantly reducing the incidence of accidental poisoning of children. Some containers, for example containers for drain cleaner, may be designed as single unit of use packages. The entire contents of the packages are used at once upon opening of such packages. In this case, a safety closure designed for a long life and multiple openings and resealings of the container is not required. However, the high standard of safety required of a safety closure cannot be compromised. I have devised a safety closure that is particularly adapted for a single unit of use container that is inexpensive yet durable and capable of meeting the required safety standards. While the safety or child-resistant feature of my closure is designed for only a single actuation, it can be re-applied to the closure to once again render the closure child-resistant.

SUMMARY OF THE INVENTION

My invention is a safety closure for a container, the container including an externally threaded finish portion and a plurality of external projections located below and adjacent to the threads. The safety closure includes a main body member which has threads formed on the interior thereof for engagement with the threads of the finish. A flexible skirt is attached to the lower portion of the main body member by a flexible circumferential ring. The skirt includes a plurality of interior, inwardly directed projections. A locking means is integrally formed with the main body member of the flexible skirt. The locking means is provided for stiffening the flexible skirt when engaged therewith to prevent removal of the closure from the container when the internal and external projections are engaged. The locking means is movable out of engagement with the flexible skirt, thereby allowing removal of the closure from the container.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view, partially in cross-section, of the closure of the present invention in the as-formed condition;

FIG. 2 is a side elevational view, partially in cross-section, of the closure of the present invention in position on a container finish with the locking feature in position to prevent removal of the closure;

FIG. 3 is a top, plan view, in cross-section, taken generally along the line 3—of FIG. 2; and

FIG. 4 is a side elevational view, partially in cross-section, showing the locking feature of the closure of the present invention disengaged and the closure partially removed from a container finish.

DETAILED DESCRIPTION OF THE DRAWINGS

The safety closure of the present invention, generally designated as 10, is shown in FIG. 1. The safety closure 10 has several major components. There is a main body member or portion 12, a flexible skirt 14 and a locking ring 16. The entire closure 10 is molded as a unitary assembly and the main body 12, skirt 14 and locking ring 16 are all interconnected. The skirt 14 is connected to the main body 12 through a relatively flexible circumferential ring 18. The locking ring 16 is connected to the lower portion of the skirt 14 through a plurality of frangible ribs 20. The locking ring 16 also includes a radially extending flange 22 which is used to remove the locking ring 16 when it is in its operational position. The main body 12 includes an upper disc member 24. A skirt portion 26 depends from the upper disc 24. The interior of the skirt portion 26 is provided with threads 28 for cooperative engagement with the thread on the finish portion of a container. The closure 10 may also include a liner 30 held in position on the interior surface of the upper disc member 24. The skirt portion 14 includes a plurality of interior, inwardly directed projections 32, which will be shown in more detail later, which are of a generally wedge-shape configuration.

FIGS. 2 and 3 illustrate the closure 10 of the present invention in position on a finish portion 34 of a container 36. The finish portion 34 includes an externally threaded section 38 whose threads will cooperate with the threads 28 formed on the interior of the skirt 26 of the main body 12. The finish portion 34 terminates in an annular rim 40 which defines an opening into the interior of the container 36. The liner 30 may be seated on the top portion of the rim 40 to effect a seal of the contents within the container 36. The finish portion 34 also includes a plurality of projections 42 which are formed on the exterior thereof below the threaded portion 38. These projections 42 are generally wedge-shaped as may be seen in FIG. 3. Note that in FIG. 2, the locking ring 16 has been moved upwardly to cover the skirt 14. In this process, the frangible ribs 20 are severed from the skirt 14 and move upwardly with the locking ring 16. This procedure makes the skirt 14 a relatively rigid area, due to the influence of the locking ring 16 which surrounds it, thus making it impossible for the skirt 14 to bend or pivot about the circumferential ring 18. This procedure is carried out before the closure 10 is applied to the container 36 and the locking ring 16 is held in this position by frictional engagement. In the application procedure, the closure 10 is threaded onto the finish 34 and the projections 32 formed on the interior of the skirt 14 will slide over the projections 42 formed on the exterior of the finish 34 during the tightening procedure. As is evident from FIG. 3, once the tightening procedure has been accomplished, it is extremely difficult to unthread or remove the closure 10 because the projections 32 and 42 lock together. Thus these two projections cooperate to form a one-way ratchet drive. So long as the locking ring 16 is in position over the skirt 14, the closure 10 may not be removed from the container 36.

It should be recalled again at this time that this particular closure 10 is primarily designed as a safety closure for a unit package. That is, the entire contents of the container 36 are designed to be utilized in one application. It is not necessary to reseal the container 36 since all of the contents will be dispensed at one time. It is, therefore, unnecessary to provide such a container

with a safety closure that is capable of maintaining its safety features through a number of openings and re-sealings. The safety closure of the present invention does have the potential of being reused, but due to its operational characteristics it would require a separate step on the part of a person resealing the container before the safety feature could be reimposed after opening. Therefore, this type of closure is not particularly adaptable for multiple use containers.

In FIG. 4, the opening sequence is clearly illustrated. The locking ring 16 is moved downwardly away from the skirt 14 by pushing on the flange 22 which is a part of the locking ring 16. This then leaves the skirt 14 free. As was previously noted, the skirt 14 is a relatively flexible element, as may be seen from the cross-sectional view of FIG. 4 which shows the wall thickness of the skirt 14 to be much less than the wall thickness of the skirt 26 which is a part of the main body 12. A person desiring to open the container in this configuration simply begins to turn the main body 12 in the untightening direction. This will place a force on the projections 32 on the skirt 14 and cause the skirt 14 to bow outwardly, pivoting about the circumferential ring 18. The removal torque or force required to begin removal is quite high and will remain high until after all of the projections 32 have completely cleared the projections 42. After this has occurred, the main body 12 may be unthreaded from the finish portion 34 with normal application of force or torque. This high initial removal torque adds an additional safety feature in that the force required would be beyond the ability of most children.

I claim:

1. A safety closure for a container, said container including a finish portion having threads formed on the exterior thereof and a plurality of external projections located below and adjacent to said threads, said safety closure comprising, in combination:

a main body member having threads formed in the interior thereof for engagement with the threads of said container finish;

a flexible skirt, attached to the lower portion of said main body member by a flexible circumferential ring, which is formed with a plurality of interior, inwardly directed projections; and

locking means, integrally formed with said main body member and said flexible skirt, for stiffening said flexible skirt when engaged therewith to prevent removal of said closure from said container when said internal and external projections are engaged, said locking means being movable out of engagement with said flexible skirt to thereby allow removal of said closure from said container.

2. The closure of claim 1 wherein said locking means includes:

an annular locking ring formed in a position below said flexible skirt; and

a plurality of frangible ribs joining said annular ring to said flexible skirt.

3. The closure of claim 2 wherein said locking means further includes:

a radially extending flange integrally formed at the outer peripheral edge of said locking ring.

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