

[72] Inventors Nick S. Houry  
 Worth;  
 Gareth J. Duggan, Crestwood, both of Ill.  
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 [73] Assignee Continental Can Company, Inc.  
 New York, N.Y.

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Primary Examiner—Leonard Summer  
 Attorney—Diller, Brown, Ramik & Holt

[54] TAMPER-INDICATING CLOSURES  
 5 Claims, 8 Drawing Figs.

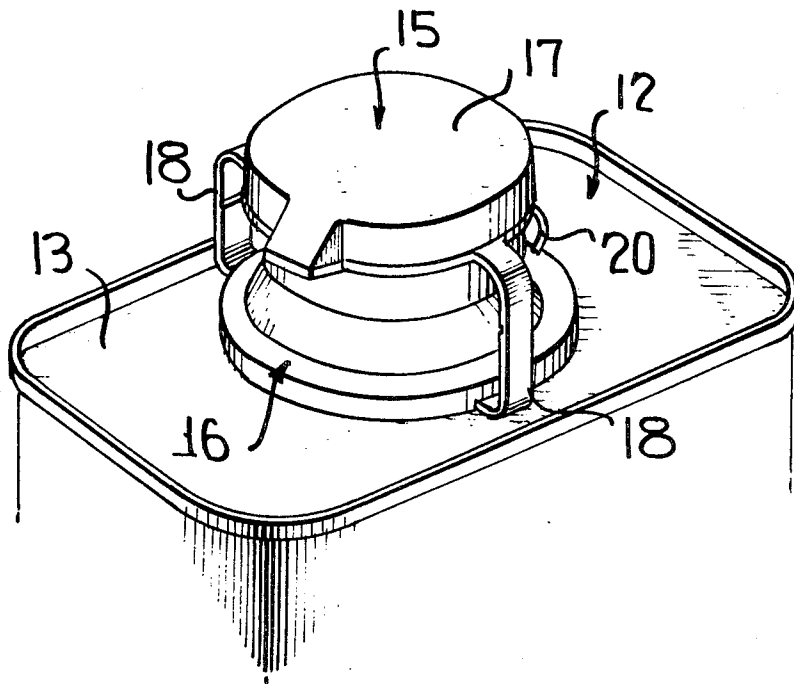
[52] U.S. Cl..... 222/153,  
 215/42, 220/27, 222/541  
 [51] Int. Cl..... B65d 41/32,  
 B67d 5/32  
 [50] Field of Search..... 222/153,  
 541; 220/27; 215/42

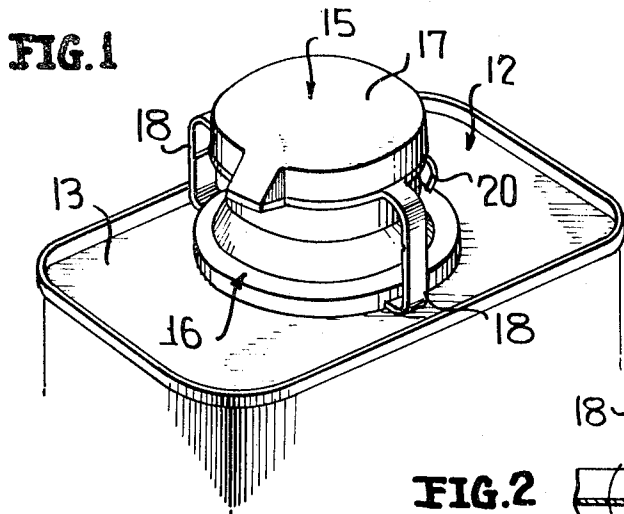
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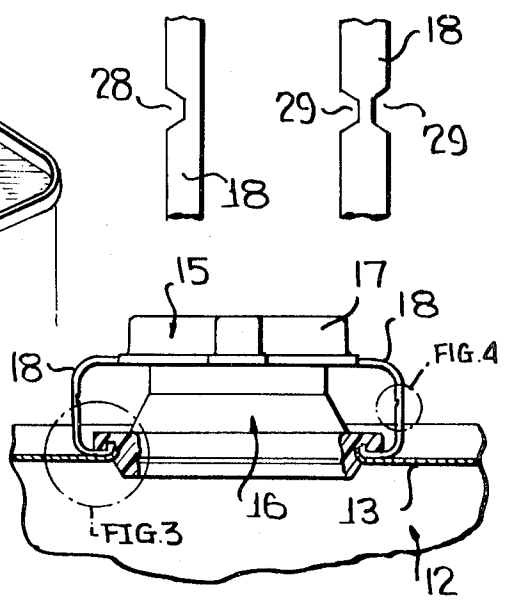
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**ABSTRACT:** This disclosure relates to tamper-indicating closures of the type which include a nozzle and a closure cap. In order that tampering may be readily apparent, the closure cap is provided with one or more straps which have their opposite ends permanently secured to the nozzle in any desired manner. The straps are of a length so that when the closure cap is removed from the nozzle, rupture of the straps is required. The straps may be suitably weakened to facilitate the rupture thereof.

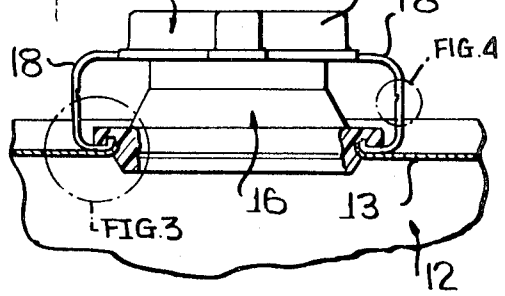




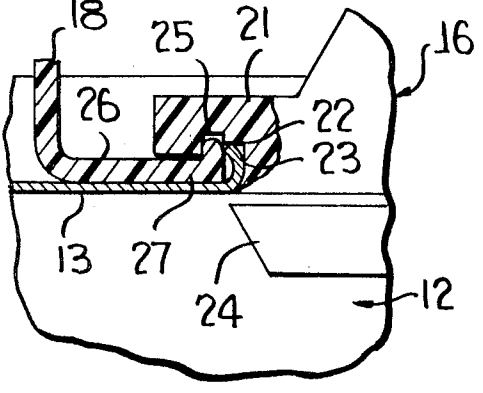
**FIG. 4      FIG. 4a**



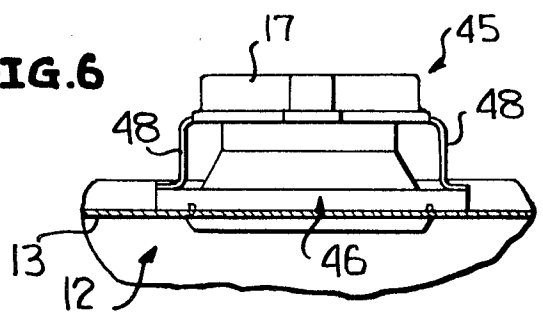
**FIG. 2**



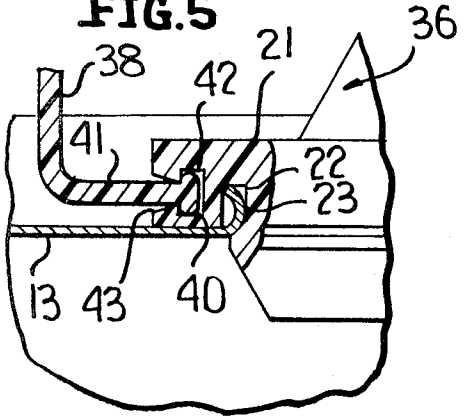
**FIG. 3**



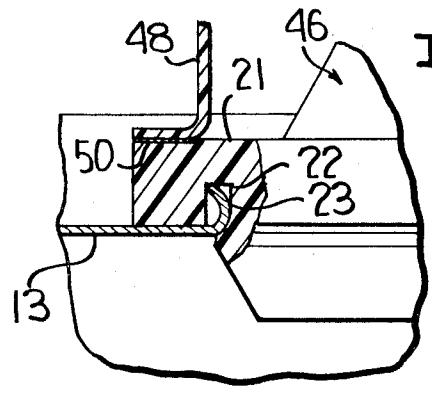
**FIG. 6**



**FIG. 5**



**FIG. 7**



INVENTORS  
NICK S. KHOURY &  
GARETH J. DUGGAN

BY *Mason, Carter, Miller & Brown*

ATTORNEYS

TAMPER-INDICATING CLOSURES

This invention relates in general to new and useful improvements in closures of the dispensing type, and more particularly to a tamper-indicating closure.

In the past many attempts have been made to provide tamperproof or tamper-indicating closures. The typical type of closure includes a nozzle and a closure cap which is releaseably secured to the nozzle and which may be readily replaced on the nozzle for resealing the same. In order to prevent tamper and for indicating tampering, the nozzle is normally provided with a rupturable diaphragm. However, this requires the removal of the closure cap in order to detect the tampering. It will be readily apparent that this is disadvantageous in that one normally purchasing a product does not desire to remove the closure cap in inspect the same to determine whether tampering has occurred.

It is, therefore, the primary object of this invention to provide external tamper-indicating means which may be readily examined during a casual observation of the container.

Another object of this invention is to provide external tamper-indicating means for closures, which indicating means are readily rupturable during the opening of a container, but which have sufficient strength so as to resist normal rupturing forces encountered during handling and shipment.

This invention particularly relates to closures of the type which include a nozzle and a closure cap, the closure cap generally being integrally formed with the nozzle and permanently secured thereto by means of a connecting strap, which connecting strap permits the ready removal of the closure cap and the movement thereof to an out-of-the-way position. The nozzle normally has a base portion which permits the ready assembly thereof with a container end by snapping engagement into an opening in the container end. In accordance with this invention, the closure cap is provided with one or more straps which extend from the closure cap and are secured to the nozzle body. The straps are suitably weakened, either by scoring or notching so as to facilitate the rupture thereof during the normal removal of the closure cap from the nozzle while at the same time permitting the straps to have sufficient strength so as to resist accidental rupture during handling, packing, etc.

In accordance with this invention, the straps carried by the closure cap may be secured to the nozzle in many ways. The straps may be bonded to the nozzle or may have mechanical interlocks therewith. If desired, a positive mechanical interlock may be assured by having the interlock between the straps and the nozzle disposed between the nozzle and the container end so as to ensure against accidental release of the straps without rupture thereof.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawing:

IN THE DRAWING

FIG. 1 is a top perspective view of a container having incorporated therein the tamper-indicating closure which is the subject of this invention, only the upper portion of the container being illustrated.

FIG. 2 is a fragmentary sectional view taken through the container to one side of the tamper-indicating closure with the closure being shown in elevation.

FIG. 3 is an enlarged fragmentary sectional view showing the details of the connection between the nozzle and the container end and one of the straps and the nozzle, the view being an enlargement of a portion of FIG. 2 identified as FIG. 3.

FIG. 4 is an enlarged fragmentary elevational view of a central portion of one of the straps, as indicated by the notation FIG. 4 on FIG. 2 and shows the specific details of the scoring of the strap.

FIG. 4a is an enlarged fragmentary side view of a modified form of strap wherein the strap is weakened by notching.

FIG. 5 is an enlarged fragmentary sectional view similar to FIG. 3 and shows a modified form of interlock between the strap and the nozzle.

FIG. 6 is a fragmentary sectional view similar to FIG. 2 showing a modified form of strap arrangement.

FIG. 7 is an enlarged fragmentary sectional view of a portion of FIG. 6 showing the specific interlock between the nozzle and the container end and the specific connection between the strap and the nozzle body.

Referring now to the drawings in detail, it will be seen that there is illustrated in FIG. 1 a dispensing-type container which is generally identified by the numeral 10. The container 10 includes a container body 11 having the upper end thereof closed by means of an end member 12. The end member 12 includes an end wall 13 which is suitably secured to the container body 11 by means of a seam 14. The end panel 13 has secured thereto the tamper-indicating closure which is the subject of this invention, the closure being generally identified by the numeral 15.

Basically, the closure 15 includes a nozzle 16, a closure cap 17 and a pair of tamper indicating straps 18 which are disposed in diametrically opposite relation and which are integrally formed with the closure cap 17 and suitably secured to the nozzle 16. If desired, the closure cap 17 may be integrally molded with the nozzle 16 and permanently secured thereto by means of a connecting strap 20. The connecting strap 20, of course, is not essential.

Referring now to FIG. 3, it will be seen that the nozzle 16 includes an annular base 21 which has formed on the underside thereof an annular groove 22. The end wall 13 has an opening therein defined by an upstanding and reversely turned curl 23. The curl 23 is seated in the groove 22 of the nozzle base 21 and preferably is in sealed contact therewith. The nozzle 16 also includes a tubular portion which projects down into the container 10 through the end wall 13, this tubular portion being identified by the numeral 24 and being interlocked to meet the end wall 13 adjacent the curl 23 so as to retain the nozzle 16 in place.

It is to be noted that the underside of the nozzle body or base 21 is provided with a generally L-shaped slot 25. The slot 25 opens down towards the outer surface of the end wall 13. The strap 18 has a reversely turned lower portion 26 which terminates in an L-shaped end portion 27 which is received in the slot 25.

The end portion 27 is positioned within the slot 25 before the nozzle 16 is assembled with the end wall 13. When the nozzle 16 is snapped into place on the end wall 13, the L-shaped end portion 27 of the strap 18 is locked within the L-shaped slot 25, as is clearly shown in FIG. 3. Thus, the strap 18 is permanently secured to the nozzle 16 at the free end thereof, while the opposite end thereof is integrally connected to the closure cap 17.

It will be readily apparent that the closure cap 17 cannot be removed from the nozzle 16 so as to open the container 10 unless one or both of the straps 18 is broken. Thus, when the container 10 has been previously opened, there will be visual evidence of the prior opening of the container after sealing.

In order that the breaking strength of the straps 18 may be controlled, it is preferred that the straps be weakened. As is clearly shown in FIG. 4, a score 28 may be formed across the inner face of the strap 18. On the other hand, as is shown in FIG. 4a the strap 18 may be weakened as by the provision of notches 29. It is to be understood that the straps 18 will have sufficient strength, despite the weakening thereof, to resist normal rupture during handling and packing.

In FIG. 5 there is illustrated a slightly modified form of nozzle and strap arrangement. The modified nozzle is identified by the numeral 36 and is identical with the nozzle 16 except for the connection of the strap 38 therewith. Accordingly, those parts thereof which are identical with like parts of the nozzle 16 will bear the same reference numerals.

It is to be noted that the peripheral wall of the body or flange 21 of the nozzle 36 is provided with a T-shaped cross section slot 40 for each strap 38. The lower end of each strap

38 is provided with an inwardly turned portion 41 which terminates in a T-shaped end portion 42 received and permanently interlocked in the T-shaped slot 40. The slot 40 is provided with a tapered entrance opening 43 which, due to the inherent resiliency of the nozzle body 21 facilitates the momentary spreading open of the slot 40 so as to receive the T-shaped end portion 42.

It will be readily apparent that once the nozzle 36 has been assembled with the end wall 13, and the mounting flange 21 is tightly clamped against the upper surface of the end wall 13, the inherent resiliency of the nozzle body of flange 21 will be greatly reduced and withdrawal of the T-shaped end portion 42 from the slot 40 will be prevented.

It is to be understood that the strap 38 corresponds identically with the strap 18 except for the aforementioned modification thereof.

In FIGS. 6 and 7 there is illustrated a slightly modified form of closure which is identified by the numeral 45. The closure 45 is identical with the closure 15 except for the configuration of straps 38 thereof and the securement thereof to the nozzle, which nozzle is identified by the numeral 46 and differs from the nozzle 16 only in the securement of the straps 48 thereto.

Referring now to FIG. 7 in particular, it will be seen that the lower end of the connecting strap 48 is provided with a reversely turned portion 49 which directly overlies the mounting flange or body 21 and the nozzle 46. The turned portion or foot 49 of the connecting strap 48 is suitably bonded to the nozzle body 21 as at 50. While it is preferred that the bond 50 be in the form of a heat seal, it is to be understood that any other desired and readily formable bond may be utilized.

It will be readily apparent that in each of the various tamper-indicating closures of this invention, it is necessary that one or both of the straps be ruptured during the removal of the closure cap from the nozzle. As a result, if there has been an opening of the container subsequent to the sealing thereof, this readily determined by inspecting the exterior of the container. Therefore, the would-be purchaser of the container and the product packaged therein may be assured that the package has not been tampered with prior to purchase.

It is also pointed out that one advantage of the tamper-indicating closure constructions of this invention is that the entire closure may be assembled, including the interlocking of the straps with the nozzle, prior to the assembling of the closure with a container. Thus, the tamper-indicating means of this invention in no way detracts from other desirable feature of the closure.

Although only several embodiments of the closure construction have been specifically illustrated and described herein, it is to be understood that minor variations may be made therein without departing from the spirit of this invention.

We claim:

1. A dispensing nozzle for a container having a tamper-indicating closure, said closure being in the form of a closure cap, and said closure cap having at least on strap connected to said nozzle in a position requiring rupture thereof to effect the removal of said cap, said strap extending radially outwardly from said closure cap and then axially in radially spaced relation to said nozzle and then radially inwardly toward said nozzle whereby rupture of said strap may be readily observed, and said strap being directly and permanently mechanically interlocked with said nozzle.

2. The nozzle claim 1 wherein said strap has a T-shaped in cross section end received in a T-shaped in cross section slot in a peripheral portion of said nozzle.

3. The nozzle of claim 1 wherein said strap has a T-shaped end received in a T-shaped slot in a peripheral portion of said nozzle with said slot having a tapered entrance and said nozzle being resilient so as to facilitate the forceful entry of said T-shaped end into said slot.

4. The nozzle of claim 1 wherein said strap has an L-shaped in cross section end seated in a like shaped slot in the underside of said nozzle.

5. The nozzle of claim 1 wherein said strap has an L-shaped end seated in a like-shaped slot in the underside of said nozzle with said L-shaped end being disposed between said nozzle and a container end supporting said nozzle.

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