

Feb. 6, 1968

J. A. LAKE

3,367,524

CONTAINER OPENING DEVICE

Filed May 2, 1966

2 Sheets-Sheet 1

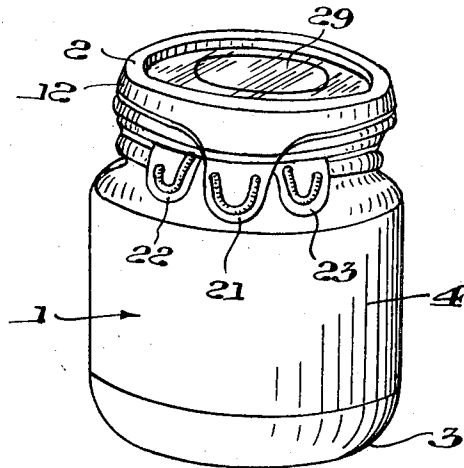


Fig. 1.

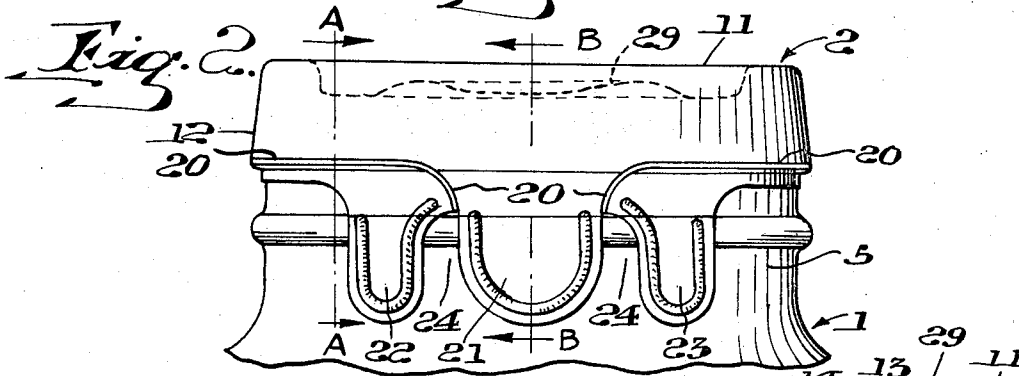
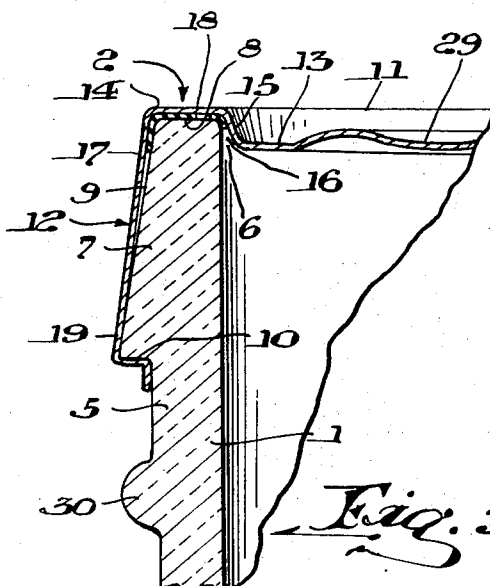


Fig. 3.

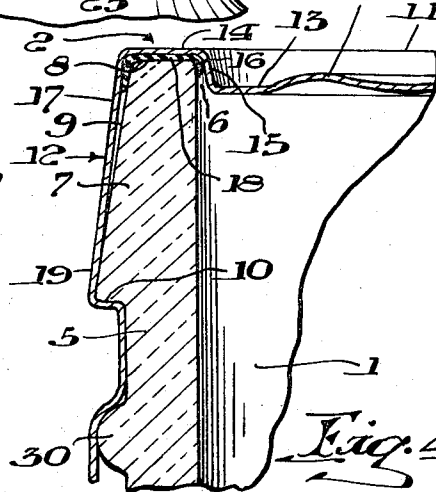


Fig. 4.

INVENTOR.
JOHN A. LAKE.

BY *Arnold B. Silverman*
his
ATTORNEY.

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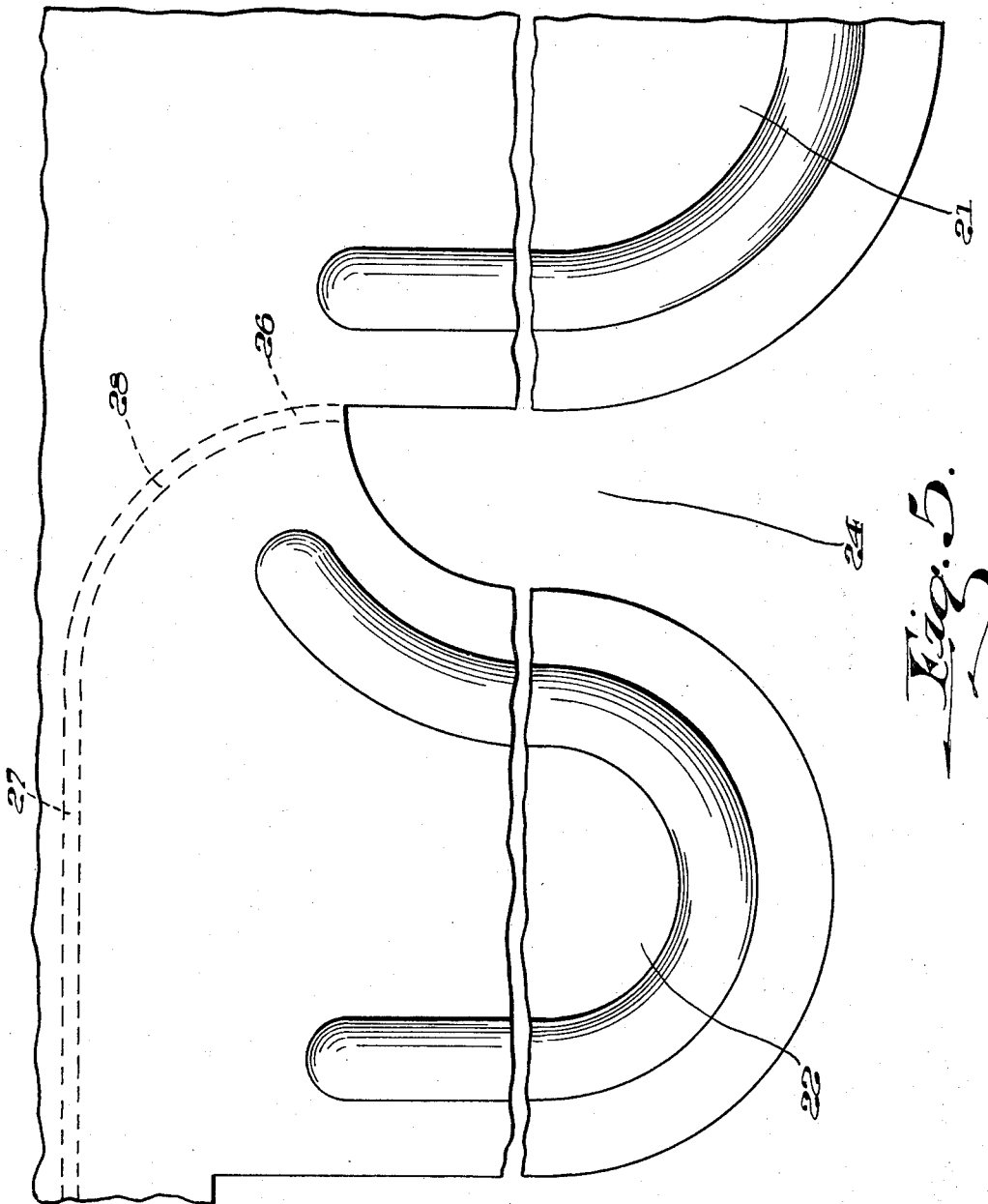


Fig. 5.

INVENTOR.
JOHN A. LAKE.

BY *Arnold B. Silverman*
265
ATTORNEY.

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3,367,524

CONTAINER OPENING DEVICE

John A. Lake, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa., a corporation of Pennsylvania

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2 Claims. (Cl. 215—40)

ABSTRACT OF THE DISCLOSURE

A sealed container assembly having a closure with three pull tabs disposed in close proximity to each other depending from the closure skirt. Either of the two outer tabs may be engaged and employed to fracture the closure skirt along a circumferentially weakened line made to permit removal of the remaining portion of the closure by means of the third pull tab.

This invention relates to tamperproof sealed containers and more specifically to containers of this type having closures adapted to be removed without the use of separate tools.

There have been numerous attempts to provide a non-metallic container which may be effectively sealed to provide a secure protective environment for its contents while retaining ease of opening characteristics. Where emphasis has been placed upon maximum security, frequent difficulty in obtaining a readily operable container have been encountered. Where emphasis has been directed toward ease of opening characteristics, difficulty with oxygen penetration and contamination has frequently resulted. Efforts have been made to employ gasket lubricants to reduce frictional resistance to opening. One difficulty involved in the use of such a lubricant, even though proven to have desired properties, is the problem of obtaining a uniform coating of a very small quantity of the lubricating material within each closure and between closures, while manufacturing them in mass production quantities.

It is an object of this invention to provide a sealed container which affords maximum security against contamination of the contents while being readily openable without the use of separate tools.

It is another object of this invention to provide a sealed container which provides a visual indication of tampering or previous opening thereof.

It is another object of this invention to provide a sealed container which has a member which is readily grasped by either the right or left hand to initiate closure severance and also provides an independent member which is readily grasped for closure removal.

It is another object of this invention to provide a sealed container having superior resistance to oxygen penetration and impact resistance.

It is yet another object of this invention to provide a sealed container which may be economically produced while maintaining superior quality control standards between closures being produced in mass production quantities.

Other objects and advantages of the invention will be understood from the following description of the invention and reference to the illustrations appended hereto, in which:

FIGURE 1 is a perspective view of a sealed container having a closure embodying a type of opening device of this invention;

FIGURE 2 is an enlarged fragmentary elevational view illustrating a type of closure opening device;

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FIGURE 3 is an enlarged sectional view through A—A of FIGURE 2 illustrating the container finish, gasket and closure sealing arrangement;

FIGURE 4 is an enlarged sectional view through B—B of FIGURE 2 illustrating the seal in the pull tab area; and

FIGURE 5 is an enlarged fragmentary detail of a portion of the closure opening device.

Referring now to the drawings, in greater detail, a non-metallic container 1, which may be made of glass, plastic or other suitable substantially rigid material, has a closure 2 sealingly engaged therewith. The container 1 has a base 3, a substantially cylindrical body 4, a neck 5 and a mouth 6 which defines a substantially circular orifice. The mouth 6 has an externally disposed bead 7 which has a substantially flat upper sealing surface 8, an outwardly and downwardly substantially straight outer sealing surface 9 and an inwardly disposed substantially horizontal surface 10 terminating at the container neck 5. The closure 2 has a panel portion 11 and a depending skirt portion 12. The panel portion 11 consists of central panel 13, an annular substantially flat periphery 14 and an angular transition portion 15 connecting the central panel with the periphery. A gasket receiving channel 16 is defined by the transition portion 15, the periphery 14 and the upper skirt portion 17. A resilient gasket 18, which may be composed of rubber, plastisol or any suitable material, is disposed within said channel and has a portion thereof extending downwardly between the outer sealing surface 1 and the closure skirt 12.

FIGURE 3 shows the manner in which the container assembly is sealed. Pressure is exerted downwardly upon the closure in order to compress resilient gasket 18. The lower skirt portion 19 is deformed inwardly into contact with the outer sealing surface 9 and is urged into sealing engagement with the shoulder surface 10. If a larger skirt is employed, the lower edge will terminate on the container neck 5 as shown in FIGURE 3, although such length is not essential to obtaining an effective seal.

Turning now to the opening device, the closure skirt 12 has a continuous scored or weakened line 20 which for convenience of description will be referred to as the dividing line between the lower skirt portion 19 and the upper skirt portion 17. The weakened line 20 is adapted to be fractured to permit removal of the lower skirt portion 19 and ultimately the remaining portion of the closure. To facilitate opening the container, three elongated tabs, consisting of a center tab 21 and two end tabs 22, 23 are formed from the closure skirt material and are disposed in close proximity to each other. The center tab 21 is separated from each end tab 22, 23 by a cut-out portion 24 and a portion of the scored line 20. The portion of the skirt connecting the center tab 21 is unscored and unweakened, while each end tab is separated from the upper skirt portion 17 by the scored line 20.

FIGURE 5 shows an enlarged section of the closure skirt 12 with tab 22 and a portion of center tab 21 being shown. The continuous scored or weakened line 20 has several portions of different orientations. Assuming that severance is to be effected with the left hand by employing tab 22, the first sector of the score line to be severed will be a substantially vertical portion 26. The other two portions are a substantially horizontal portion 27 which extends circumferentially around a major portion of the skirt and a curved transitional portion 28 connecting portion 26 with portion 27. Similarly, at the terminal edge of the scored line 20 the substantially horizontal portion 27 will be connected with a substantially vertical portion which separates the center tab 21 from the end tab 23, by means of a curved transitional portion. While in the preferred form of the invention the curved transitional portions are of constant radius, this is not essential to

the invention. In another embodiment of the invention, the substantially vertical portions are curved and may be of the same radius as the curved transitional portions, thereby minimizing the likelihood of difficulty produced by a stress concentration. In order to facilitate severance of the weakened line 25, the substantially horizontal portion thereof should preferably be placed above the plane of the inwardly disposed surface 10 of the external bead 7.

The opening of the container may be initiated with either hand as it is adapted for either clockwise or counterclockwise opening, depending upon which end tab 22, 23 is grasped. In opening the container 1 with the right hand, end tab 23 is grasped with the hand and pulled initially upwardly and then circumferentially counterclockwise around the entire skirt thereby severing the entire scored line 20 and removing the lower skirt portion 19. Center tab 21 is then grasped and raised in order to remove the remaining portions of the closure from the container and permit access to the container contents. In using the left hand to open the container, a similar process is followed, only tab 22 is grasped and tearing is effected in a clockwise direction. Thus, this container eliminates the awkwardness of having a left handed individual attempt to open a sealed container designed for use by a right handed individual.

As the closure, which is preferably made of a suitable metal such as aluminum, is likely to be of relatively thin sheet material, it is deemed advantageous to employ stiffening means to add rigidity to the tabs. This is particularly advantageous with respect to the end tabs 22, 23, one of which will be employed to sever the weakened line 20 and thereby remove the lower skirt portion 19. The most economical means of stiffening a tab is by forming one or more non-coplanar portions therein. By way of illustration, an elongated stiffening rib is shown in the drawings. In the preferred form a part of the reinforcing means will be adjacent the substantially vertical weakened line portion. This will result in more efficient transmittal of the applied force to the score line in order to facilitate stress build-up and ease of severance. While the non-coplanar portions will facilitate the gripping of a tab, it may also be desired to further improve grippability by providing one or more apertures or holes in the tab.

When the sealed container is a vacuum package, after the lower skirt portion 19 is removed, atmospheric pressure will retain the remaining portion of the closure on the container mouth 6 and the vacuum will not be broken until the center tab 21 is pulled to remove the remainder of the closure.

It will be appreciated that the sealed container having the closure skirt secured in the fashion described above, an attempt to open the container or tamper therewith will result in a fracture of a portion of the score line which will be readily apparent to a prospective purchaser upon making a casual inspection of the sealed container.

As it is possible that a sealed container through error in packaging or damage in shipment or storage may lose all or part of its vacuum and yet not have been tampered with, it is desirable in vacuum packages to provide a visual and/or audible indicator sensitive to the pressure differential across the closure panel. Many such devices are known in the art. One commonly used type of indicator employs a normally outwardly domed portion in the closure panel which assumes a convex configuration upon being sealed on a vacuum container. As is shown in FIGURE 2, the closure of this invention is adapted for use with a vacuum indicator 29 which conveniently fits into the central panel portion 13. This will not only provide a safety indicator to the consumer in the store, but in view of the retention of vacuum after removal of the lower skirt portion 19, a container, in which the lower skirt portion 19 has been inadvertently severed, may be safely put away. If through impact or other causes something occurs prior to actual use to destroy the vacu-

um, the consumer will receive a positive indication of the contamination hazard.

As a substantial portion of the closure skirt is retained after severance of the lower skirt portion 19, the remaining portion may be employed as a reclosure in the event the container contents are not entirely consumed at the time of initial opening.

Another feature which is present in the preferred form of the invention but not essential thereto, is an annular bead 30 which is outwardly directed and disposed on the container neck, longitudinally downwardly displaced from the other external bead 7. As is shown in FIGURE 4, this bead acts to urge the lower portions of tabs 21, 22, and 23 outwardly to facilitate grasping thereof by the one opening the container. For maximum benefit, the tabs should extend downwardly beyond the point of maximum outer diameter of the bead. In order to effect a seal around the entire circumference, the upper portions of the tabs 21, 22, 23 must be crimped into engagement with the inwardly disposed surface 10 and a portion thereof will be in contact with the container neck 5. It is, therefore, desirable but not essential that means be provided for facilitating the gripping of the tabs.

Whereas particular embodiments of the invention have been described above for purposes of illustration, it will be apparent to those skilled in the art that numerous variations of the details may be made without departing from the appended claims.

What is claimed is:

1. A sealed container assembly comprising, in combination:
 - a non-metallic substantially rigid container having
 - a base,
 - an upwardly extending substantially cylindrical body terminating in an annular neck portion of smaller outer diameter than said body and said neck portion having an annular mouth portion defining a substantially circular orifice,
 - said mouth portion having an externally disposed bead which has a substantially flat upper sealing surface, an outwardly and downwardly disposed substantially straight outer sealing surface and an inwardly disposed substantially horizontal surface terminating at the outer surface of said neck,
 - a second outwardly directed annular bead disposed on said neck longitudinally downwardly displaced from said other externally disposed bead,
 - a unitary closure member sealingly engaged with said container having
 - a panel portion and
 - a depending skirt portion
- said panel portion having an annular substantially flat periphery,
- a central area recessed with respect to said periphery and
- an angular transition portion joining said central area with said periphery,
- a gasket receiving channel defined by said transitional area, said periphery and the upper portion of said depending skirt,
- three elongated tabs consisting of a center tab and two end tabs depending downwardly from said skirt and disposed in close proximity to each other,
- and a portion of each of said dependent tabs in contact with said second bead extending downwardly beyond the longest diameter of said bead, and being urged radially outwardly thereby to facilitate gripping thereof
- each of said tabs having integral reinforcing means, said center tab being separated from each said end tab by a cut-out portion and a weakened line and said means on said end tabs comprising at least one elongated bead having a portion

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thereof adjacent a vertically disposed portion of said weakened line, said weakened line originating between said center tab and one of said end tabs, having an initial portion extending substantially vertically upward, a substantially horizontal portion extending around a major portion of said skirt, a curved transitional portion joining said initial portion with said substantially horizontal portion; a terminal portion extending substantially vertically downward terminating between said center tab and said other end tab and a curved transitional portion joining said terminal portion with said substantially horizontal portion, either said end tab being adapted to be grasped and pulled to effect complete severance of said weakened line and removal of the lower portion of said skirt and said center tab adapted to be grasped to remove the remaining portion of said closure after complete severance of said weakened line, and a sealing gasket disposed within said gasket receive-

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ing channel and extending downwardly between said closure skirt and said outer sealing surface of said bead.

2. The sealed container of claim 1 wherein said substantially horizontally disposed portion of said weakened line is disposed above the plane of said inwardly disposed substantially horizontal surface.

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DONALD F. NORTON, *Primary Examiner.*