Oct. 4, 1938. O. I. WARING 2,131,775

CONTAINER CLOSURE

Filed Dec. 28, 1937

Fig. 1.

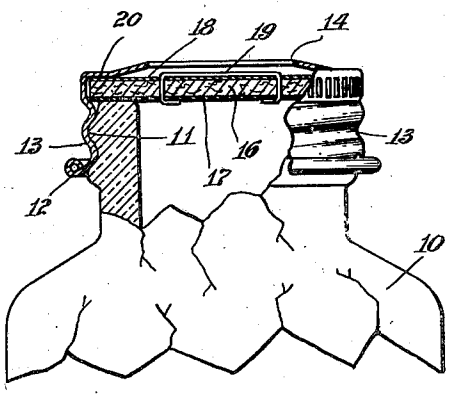


Fig. 2.

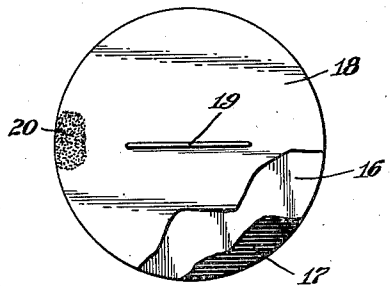


Fig. 6.

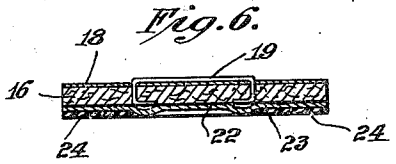


Fig. 3.

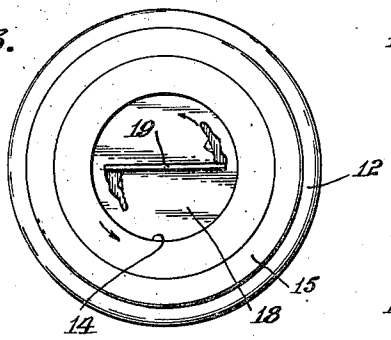


Fig. 7.

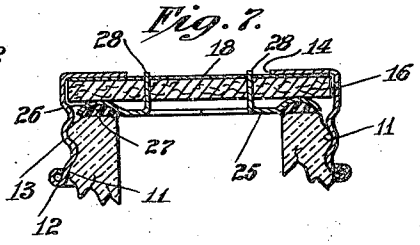


Fig. 4.

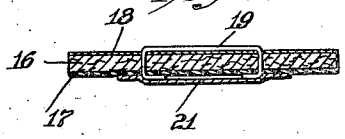


Fig. 8.

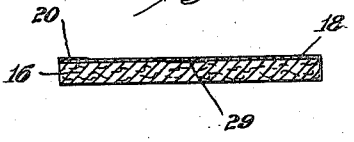
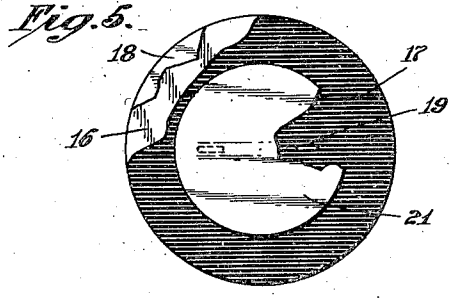


Fig. 5.



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2,131,775

CONTAINER CLOSURE

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Application December 28, 1937, Serial No. 182,052

11 Claims. (Cl. 215—7)

The invention relates to container closures, and more particularly to a closure so constructed as to prevent the refilling or adulteration of the contents of a container without detection.

It is not an uncommon practice for unscrupulous merchandisers to refill containers with inferior stock, or to remove a part of the contents of a container and dilute the original product. Sometimes counterfeit labels and closures are used in the packaging of inferior merchandise. Such practices, in addition to reducing the volume of business of a legitimate producer by the palming off of inferior merchandise in containers bearing its labels and closures, adversely affect the reputation of the merchandise with the public because of such inferiority. Losses to legitimate producers from the above sources may be very great. Reduced sales and a reputation for a poor product are not the only sources of loss since advertising and sales cost, with a reduced demand, show further great losses when the demand thus created is supplied by inferior merchandise furnished by others.

With the above conditions in mind, I have produced a container closure of the re-seal type, wherein the liner is adapted to act against and to engage, frictionally or adhesively, the top of the mouth of a container, and has associated therewith and positioned between it and a shell, a disc of rupturable material exposed through an opening in the shell, so secured in relation to the liner that turning the shell while the liner is compressed and engaged with the container mouth will cause the rupture of this disc during the initial turning movement in removal of said shell. In this manner, the removal of the closure from a container is prevented without a resulting presence of physical evidence that the closure has been disturbed.

The disc of rupturable material may have impressed thereon a safety design attesting genuineness of the contents of the container, which design may embody safeguards against counterfeiting, commonly found in bank notes, stamps and negotiable instruments of various kinds, and an ink containing water soluble coloring matter may be used so that by wetting the disc through the opening in the shell, reactions resulting in smudging in the design may be relied upon as a further safeguard against counterfeiting.

In bottling various materials, machines are used for applying the closures to the containers, and it is desirable that the outer shell of the closure be so formed as to avoid parts protruding therefrom to an extent to interfere with the proper agitation of the closures while in the hopper of the applying machine.

A closure embodying the invention acts in exactly the same manner as an ordinary re-seal closure while being applied to or removed from the container, with the exception that when removing it from the container, the shell and the rupturable disc have such movement in relation to the liner as to cause the mutilation of said disc in the manner above referred to.

The disc of rupturable material is secured at one point to the liner, and at some point toward the periphery thereof to the shell, thus permitting movement of a limited portion of the disc in relation to the liner with the shell, during which the rupturing herein referred to occurs.

The means of securing the disc to the other parts of a closure is capable of wide variation.

Prior to my present invention, the practice of interposing a disc of rupturable material between a sealing gasket in the shell and the neck of the bottle or other container has been extensively followed, this inner sealing disc having been cemented to the neck of the container to prevent access to the container without rupturing said disc.

With the packaging of many beverages, such as ardent liquors, the presence of an adhesive about the pouring lip at the mouth of the container may be objectionable, so that in producing the closure of the invention, a construction has been employed which does not require the use of any adhesive upon or about the top of the container neck, the effectiveness of the seal being secured solely by the engagement of the liner or gasket within the shell and the neck of the bottle.

When the closure is applied to the container with a turning motion, the liner or sealing gasket is of a material which may be made to have free sliding contact with the neck of a container while applying the closure thereto; a volatile lubricant, such as water, may be applied to the neck of a container to ensure such free sliding contact, slippage being essential to permit the turning of the shell, the liner and the rupturable disc in unison when applying the closure to avoid rupturing the material of the disc.

The invention consists primarily in a container closure embodying therein a shell having an opening through the top thereof, and means engageable with co-operating means about the neck of a container requiring turning movement of the shell in removing a closure from the container, a liner or gasket of compressible material within said shell capable of adherence to the

neck of a container, a disc of rupturable material positioned between said liner and said shell, and means securing one portion of said disc to said liner, and another portion thereof to said shell, whereby when removing a closure from a container, said shell and said disc may have movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell; and in such other novel features of construction and combination of parts as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawing,

Fig. 1 is a view of a fragmentary portion of the neck of a container with a portion of the closure broken away;

Fig. 2 is a plan view of the liner and attached rupturable disc used in the form of the invention shown in Fig. 1 with portions thereof broken away;

Fig. 3 is a plan view of the closure shown in Fig. 1 after removal from a container;

Fig. 4 is a sectional view of the liner and disc in which the central portion of the exposed face of the liner is protected by a center spot;

Fig. 5 is a bottom plan view of Fig. 4;

Fig. 6 is a sectional view of another form of liner;

Fig. 7 is a similar view of still another form of liner; and

Fig. 8 is a sectional view of still another form of liner.

Like numerals refer to like parts throughout the several views.

In the accompanying drawing, the invention is shown in connection with a container 10 of glass or other material having, about the neck thereof, exterior means such as inclined lugs or screw threads 11 engageable with co-operating means upon a closure to retain the closure upon the container while permitting the removal of the closure by a turning movement thereof.

The closure proper consists of a shell having a skirt 12 provided with means such as screw threads 13 co-operating with the exterior attaching means upon the neck of the container. This shell has an opening 14 through the top thereof affording an edge rim 15 for compressing a liner or gasket into the desired sealing contact with the top of the neck of the container 10.

Within the shell is a sealing liner or gasket 16 adapted to engage the top of the neck of the container, and to be so compressed by the rim 15 as to form an effective sealing joint about the top of the neck of said container. This gasket must possess two characteristics. It must be sufficiently compressible to form a tight seal when applying the closure, and it must be capable of adhering to the neck of the container when so compressed to an extent to permit turning movement of the shell, when removing the closure, without imparting turning movement to the liner or gasket until the pressure on the gasket has been relieved.

The liner structure may take a variety of different forms, several of which are illustrated in the accompanying drawing. While these different liners vary in their detailed construction, they having common the feature that the portion of the liner engageable with the neck of a container is of compressible material capable of adhering to the neck of the container when compressed, to an extent to permit turning movement of the shell, when the closure is removed, without imparting turning movement to the liner until the compression has been relieved, and that this liner has secured thereto a rupturable disc, a portion of which, adjacent its periphery, is capable of being secured to the edge rim 15.

In the embodiment of the invention shown in Figs. 1 to 3, the liner 16 is shown as being composed of pulp board having the under or exposed face thereof, in the assembled closure, coated with a rubber compound or other material 17. It is merely essential that the portion of this liner which engages the closure be so coated, although, as a matter of manufacturing expediency, the coating of the entire disc is preferable.

A liner or gasket so formed possesses a sufficiently high degree of compressibility to form an effective seal, pulp board being commonly used in re-seal closures. The vulcanized rubber or other composition of the coating is strongly adherent to the pulp board and will, in the presence of a volatile lubricant such as water, permit free turning of the liner in relation to the neck of the container, but after the application of pressure, will be self-adherent to said neck.

The diameter of the liner is sufficiently smaller than that of the inside of the shell closely adjacent the top thereof, to permit free turning movement of the shell in relation thereto, and sufficiently larger than the inside diameter of the screw threads 13 to prevent the escape of the liner from the shell.

In the assembled closure there is interposed between the liner 16 and the rim 15, a disc 18 of rupturable material such as thin paper or similar material, secured to the liner 16 by a staple or stitch of thin wire 19. At some point or points adjacent the edge of the disc, it is bonded to the rim 15 by means of adhesive, indicated at 20. The staple or wire stitch 19 is turned or clinched against the coating 17.

The disc 18 is exposed through the opening 14 in the top of the shell and may be decorated in the manner heretofore described, the decorated portion being exposed through said opening.

The closure made the subject matter of the invention is not suitable for use in the packaging of carbonated or otherwise charged beverages. The use of the staple or wire stitch 19 will, however, permit the use of the closure with the bottling of uncharged liquids without possibility of leakage.

The portion of the coating 17 exposed within the opening of the container neck serves to protect the liner 16 from the liquid contents of the container. It may be desirable, however, to provide facing means, other than the coating 17, protecting this portion of the liner. This is done, as shown in Figs. 4 and 5 of the drawing, by providing the central portion of the liner with a facing spot or disc 21 of metal or other material neutral to the contents of the container. This center spot or facing disc may be secured by means of any desired adhesive and will serve to prevent contact of the contents of the container with the material of the coating 17, as well as with the upset ends of the staple 19.

It may be desirable to provide the under or exposed face of the liner disc with a metallic plate 22 against which the ends of the staple or wire stitch impinge when inserting same through the disc 18 and the liner disc 16, so as to clinch or upset the ends of the staple during the stapling operation. When such a plate is used, (Fig. 6) an annular rib 23 is formed upon the plate, and a ring gasket 24 is molded or secured

between this bead and the outer periphery of the plate. This gasket 24 is of vulcanized rubber or other material, similar to that used in the coating 17. Said plate 22 is cemented to said liner.

In the embodiment of the invention shown in Fig. 7, instead of using a staple or wire stitch to secure the disc 18 in relation to the liner 16, I provide a metal plate 25 having an inverted channel formed about the periphery thereof, as shown at 26, which channel is filled with a rubber composition or other material 27 like that used in the coating 17. This plate has a plurality of prongs 28 projecting upwardly through the liner 16 and into the opening 14 through the top of the metal shell.

Referring to the embodiment of the invention shown in Fig. 8, the paper or other rupturable disc 18, centrally thereof, is bonded at 29 to the liner proper 16 and to the inturned rim 15 of the metal shell. In all other respects this embodiment of the invention is as shown in Figs. 1 to 3, the sole difference, as pointed out, being the use of a spot of adhesive about the center of the disc and of the liner for securing these parts together, in lieu of a wire staple or stitch 19.

As compared with this embodiment of the invention, the use of a staple or of prongs, as shown in the other embodiments, is preferable because with the use of such staple or prongs, the fibers of the paper or other material have already been disturbed where these parts penetrate the paper, so that the subsequent tearing or rupturing of the paper when moving the shell is more positive and definite. If adhesives solely are relied upon, there is a possibility, in some instances, that the paper may not be torn.

In all embodiments of the invention shown, the essential characteristic of a closure embodying the invention is present, to wit: a construction by which, during removal of the closure, turning of the paper disc with the shell is prevented by the adherence of the liner to the top of the container, mainly by friction but possibly in part by the self-adherent properties of the facing or coating of the liner when pressed against the neck of the container. Hence, movement of the shell, independently of the liner, causes tearing of the disc 18 at the point of its connection with the liner as a result of the connection of this disc with the shell.

In some well known forms of closures, the engaging means 13 are not present before application of the closure to the container, but are formed during application. In such cases, the closure is applied without being rotated and no lubricant is needed. But removal of the closure is accomplished with a rotary motion which ruptures the disc 18.

In use, the action of a closure embodying my invention is substantially as follows:—

To apply a closure, of the type having a screw threaded skirt, it is merely necessary to mesh the co-operating means 13 on the skirt of the closure and screw threads 11 on the neck of the container and turn the shell. When so applying the closure, the liner is loosely retained within the shell, in part by the attachment between the disc 18 and the rim 15, and in part by the presence of the screw threads below the liner. Consequently, the liner and the disc 18 turn freely with the shell until the coated portion of the liner is engaged with the top of the neck of the container.

After the initial engagement of the liner with the neck of the container, it still has turning movement in relation to said neck, although the amount of such movement is small because of the pitch of the threads and the rapid development of compressive stresses upon the liner. Slippage, however, between the liner and the neck of the container does occur, so that a proper sealing relation of the liner and the neck of the container is secured without mutilating the disc 18.

It is preferable, to avoid a possible rupture of the disc 18 when applying the closure to a container, to apply a lubricant to the neck of the container. With a vulcanized rubber compound such as described, this lubricant may be plain water which is neutral to any contents of a container and in a very short time will evaporate, so that any adhesion between the liner and the neck of the container will result, either from friction engendered between the neck of the container and the liner coating, or by properties inherent to the coating 17.

No adhesive is used. When the liner is thus adhered merely by the exertion of mechanical pressure thereon, and the effect of said pressure upon the contacting surfaces, the removal of the closure from the container without rupturing the disc 18 is prevented.

When removing the closure, it is merely necessary to impart a reverse rotation to the shell. During the initial turning movement, the shell moves slightly away from the liner, because the liner is held against the neck of the container, and turns freely in relation to the liner. Since the disc 18 is bonded to the shell, this disc has turning movement therewith and in relation to the securing means between same and the liner. During this turning movement, the disc is torn or ruptured, so that the fact that the closure has been removed may be detected through the opening 14.

After the disc has been ruptured, the screw threads upon the skirt of the shell engage the lower face of the liner and force it out of contact with the conainer mouth. No adhesive being used, the top of the mouth of the container will have no foreign substances thereon. The presence of adhesive upon the mouth of the container is sometimes objectionable.

Irrespective of the detailed construction of the means attaching the closure to a container, a turning of the closure is necessary to remove same, and this turning movement will inevitably rupture the protective paper disc in the manner above described. Hence, access cannot be had to a container without leaving well defined indications that the closure has been removed.

After a closure has once been removed, and notwithstanding that the disc 18 has been destroyed, the closure may be used for re-sealing purposes by the ultimate consumer.

As heretofore stated, if the material of the coating 17 may be acted upon by the contents of the container to impart an objectionable taste or flavor thereto, this portion of the container may be protected by a center spot, as shown in Figs. 4 and 5, of the character long used in connection with closures of the crown type.

If the form of liner shown in Fig. 6 be used, the staple 19 may be applied after the closure is upon the container, so that a Government stamp may be used as a part of the disc 18, which stamp will be automatically cancelled when the closure is removed from the container.

The action of the form of liner shown in Fig. 7 is like that shown in Figs. 1 to 6, except that the

prongs 28 for tearing the rupturable disc 18 are used in lieu of the thin wire staple.

As to the form of the invention shown in Fig. 8, rupturing of the disc 18 will result if this disc is made of very fragile material, and a sufficiently strong bond is secured between same and the metal shell. This form of the invention, however, lacks the reliability of the other forms shown, and is not capable of production in a manner to secure uniformity in all closures produced.

It is not my intention to limit the invention, considered in its broader aspects, to any particular manner of securing the disc 18 to the liner and to the shell, it being obvious that various expedients may be resorted to which will secure the desired mode of operation as above described.

Having described the invention, what I claim as new and desire to have protected by Letters Patent, is:—

1. A container closure embodying therein a shell having an opening through the top thereof, and means engageable with co-operating means about the neck of a container requiring turning movement of the shell in removing a closure from the container, a liner or gasket of compressible material within said shell capable of adherence to the neck of a container, a disc of rupturable material positioned between said liner and said shell, and means securing one portion of said disc to said liner, and another portion thereof to said shell, whereby when removing a closure from a container, said shell and said disc may have movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell.

2. A container closure embodying therein a shell having an opening through the top thereof, and means engageable with co-operating means about the neck of a container requiring turning movement of the shell in removing a closure from the container, a liner or gasket of compressible material within said shell having a surface coating upon the exposed face thereof capable of adherence to the neck of a container, a disc of rupturable material positioned between said liner and said shell, and means securing one portion of said disc to said liner, and another portion thereof to said shell, whereby when removing a closure from a container, said shell and said disc may have movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell.

3. A container closure embodying therein a shell having an opening through the top thereof, and means engageable with co-operating means about the neck of a container requiring turning movement of the shell in removing a closure from the container, a liner or gasket of compressible material within said shell capable of adherence to the neck of a container, a disc of rupturable paper having a safety design impressed upon the portion thereof exposed through said opening positioned between said liner and said shell, and means securing one portion of said disc to said liner, and another portion thereof to said shell, whereby when removing a closure from a container, said shell and said disc may have movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell.

4. A container closure embodying therein a shell having an opening through the top thereof, and means engageable with co-operating means about the neck of a container requiring turning movement of the shell in removing a closure from the container, a liner or gasket of compressible material within said shell having a surface coating upon the exposed face thereof capable of adherence to the neck of a container, a disc of rupturable paper having a safety design impressed upon the portion thereof exposed through said opening positioned between said liner and said shell, and means securing one portion of said disc to said liner, and another portion thereof to said shell, whereby when removing a closure from a container, said shell and said disc may have movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell.

5. A container closure embodying therein a shell having an opening through the top thereof, and means engageable with co-operating means about the neck of a container requiring turning movement of the shell in removing a closure from the container, a liner or gasket of compressible material within said shell capable of adherence to the neck of a container, a disc of rupturable material positioned between said liner and said shell, a wire staple or stitch passing through said disc and said liner, and means securing said disc adjacent the edge thereof to said shell, whereby when removing a closure from a container, said shell and said disc may have movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell.

6. A container closure embodying therein a shell having an opening through the top thereof, and means engageable with co-operating means about the neck of a container requiring turning movement of the shell in removing a closure from the container, a liner or gasket of compressible material within said shell having a surface coating upon the exposed face thereof capable of adherence to the neck of a container, a disc of rupturable material positioned between said liner and said shell, a wire staple or stitch passing through said disc and said liner, and means securing said disc adjacent the edge thereof to said shell, whereby when removing a closure from a container, said shell and said disc may have movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell.

7. A container closure embodying therein a shell having an opening through the top thereof, and means engageable with co-operating means about the neck of a container requiring turning movement of the shell in removing a closure from the container, a liner or gasket of compressible material within said shell capable of adherence to the neck of a container, a disc of rupturable paper having a safety design impressed upon the portion thereof exposed through said opening positioned between said liner and said shell, a wire staple or stitch passing through said disc and said liner, and means securing said disc adjacent the edge thereof to said shell, whereby when removing a closure from a container, said shell and said disc may have movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell.

8. A container closure embodying therein a shell having an opening through the top thereof, and means engageable with co-operating means about the neck of a container requiring turning movement of the shell in removing a closure from the container, a liner or gasket of compressible material within said shell having a surface coating upon the exposed face thereof capable of adherence to the neck of a container, a disc of

rupturable paper having a safety design impressed upon the portion thereof exposed through said opening positioned between said liner and said shell, a wire staple or stitch passing through said disc and said liner, and means securing said disc adjacent the edge thereof to said shell, whereby when removing a closure from a container, said shell and said disc may have movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell.

9. A container closure embodying therein a shell having an opening through the top thereof, and a screw threaded skirt adapted, in co-operation with the screw threads upon the neck of a container, to permit the application or removal of a closure from the container by a turning movement of the closure, a liner or gasket of compressible material within said shell having a surface coating upon the exposed face thereof capable of adherence to the neck of a container, or to have free sliding movement in relation thereto when a lubricant is interposed between said surface and the neck of the container, a disc of rupturable material positioned between said liner and said shell, a wire staple or stitch passing through said disc and said liner, and means securing said disc, adjacent the edge thereof, to said shell, whereby when a lubricant is applied to the neck of a container, said shell, said disc and said liner may be turned in unison when applying the closure to a container, and said shell and said disc may have movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell when removing the closure from the container.

10. A container closure embodying therein a shell having an opening through the top thereof, and means engageable with co-operating means about the neck of a container requiring turning movement of the shell in removing a closure from the container, a liner or gasket of compressible material within said shell, a metal plate upon one side of said liner, a ring gasket of a material capable of adherence to the neck of a container upon the exposed face of said plate about the edge thereof, a disc of rupturable material positioned between the other face of said liner and said shell, a wire staple or stitch passing through said disc and said liner with its ends upset against said metal plate, and means securing said disc adjacent the edge thereof to said shell, whereby when removing a closure from a container, said shell and said disc may have movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell.

11. A container closure embodying therein a shell having an opening through the top thereof, and means engageable with co-operating means about the neck of a container requiring turning movement of the shell in removing a closure from the container, a liner or gasket of compressible material within said shell, a metal plate upon one side of said liner, a ring gasket of a material capable of adherence to the neck of a container upon the exposed face of said plate about the edge thereof, a disc of rupturable material positioned between the other face of said liner and said shell, prongs upon said metal plate passing through said liner and through said disc for securing said disc to said liner, and means securing said disc adjacent the edge thereof to said shell, whereby when removing a closure from a container, said shell and said disc may mave movement, independently of said liner, to an extent to cause the rupturing of said disc upon turning movement of said shell, after lubricant has evaporated.

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