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RUPTURABLE CROWN CAP

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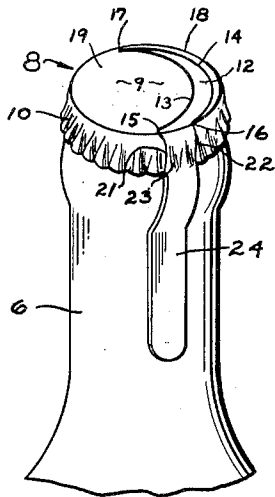


Fig. 1

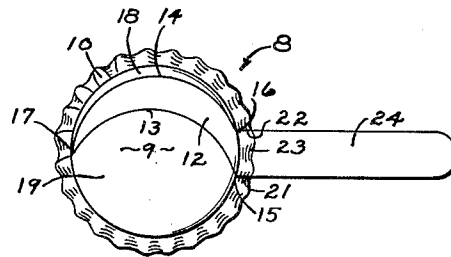


Fig. 2

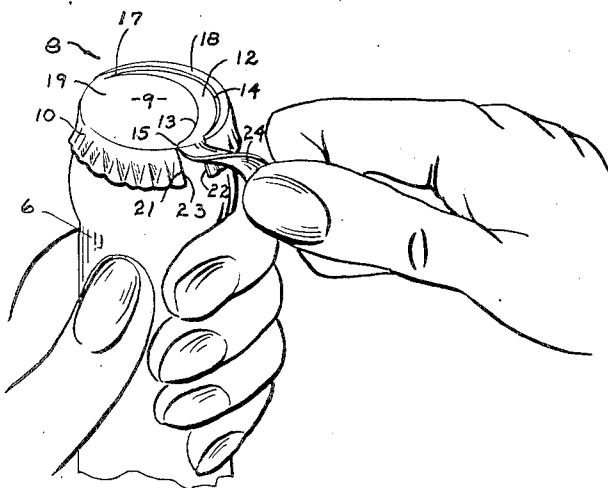


Fig. 3

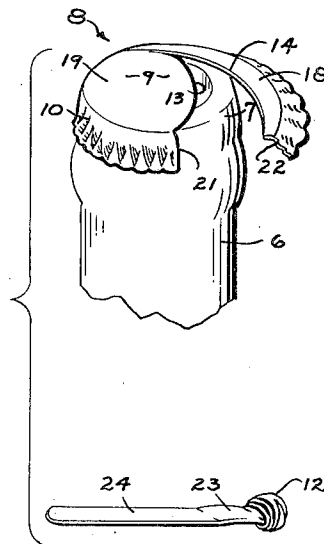


Fig. 4

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RUPTURABLE CROWN CAP

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2 Claims. (Cl. 215-46)

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This invention relates to closures for bottles, jars, and like containers and more particularly relates to sealing caps of the kind having a locking flange commonly crimped upon an annular shoulder at the mouth of a container and known as crown caps.

It is an object of my invention to provide a sealing cap which may be removed from a bottle or like container without the use of a bottle opener or other instrument.

A further object of my invention is to provide a sealing cap which may be readily applied to a bottle by existing bottling machinery but which is destroyed by the act of removing it, so that its presence in unbroken condition is a substantial guarantee that the contents of the bottle are also in the condition in which they left the bottling plant.

I am aware that others before me have sought to provide bottle caps which would attain the above objectives and have utilized the tear-strip principle in the construction of their caps; that is, they have provided caps having indented or otherwise weakened lines of rupture defining the sides of a strip extending transversely of the caps, the removal by rupture of this strip permitting the cap to be spread and removed from the bottle. However, none of these caps of which I am aware have met with favorable response from the bottling industry or from the public, in spite of the great advantage that they could be removed without using a bottle-opener, because they suffered from two great disabilities, the avoidance of either of which brought the other closer. Either the lines of rupture had to be made so weak that the cap was unsuited for sealing bottles of carbonated beverages in which a considerable internal pressure might be generated, or the lines of rupture were so strong that the cap could be torn open only by a person with strong fingers. In either case, the person attempting to remove the cap would do well to have tough and calloused fingers, as the ruptured edges of the tear-strip were sharp and exposed, and people would inevitably place their fingers against the tear-strip to gain leverage.

It is accordingly a further object of my invention to provide a sealing cap of the tear-strip type in which mechanical leverage is provided for tearing the lines of rupture and in which the ruptured edges of the tear-strip are remote from a position in which they might injure the fingers of a person removing the cap.

In broad terms, I accomplish the foregoing objects and others which will become apparent

as this specification of a preferred embodiment of my invention proceeds, by forming on a bottle-cap a tear-strip which is substantially radial to the cap at the crimped or locking edge portion of the cap and which then departs from the radial alignment at a substantial angle and follows a non-rectilinear course across the plane surface of the cap to a point diametrically opposite to its starting point. A handle or tab is provided for the tear-strip, which may extend radially to the cap or may, being thin and pliable, be folded across the top of the cap or down the side of the bottle-neck, or be twisted and moved to other positions relatively to the tear-strip. When the tab is brought to a position of radial extension to the cap, it is angulated in relation to the part of the tear-strip traversing the cap, although lying in the same plane, in substantially the same relation that the handle of a sickle bears to the sickle blade. It thereby forms a key integral with the tear-strip, by which the tear-strip may easily be ruptured and removed by rotation of the tab-key in the well-known manner in which a separate key is used to open a sardine can or coffee can. The cap may then be spread and removed.

In the accompanying drawing, illustrative of a preferred embodiment of my invention,

Fig. 1 is a perspective view showing my improved closure applied in sealing position to a bottle;

Fig. 2 is a plan view of the blank from which the closure is formed;

Fig. 3 is a view similar to Fig. 1, showing how the tab is used as a key to rupture the tear-strip; and

Fig. 4 is an exploded view showing the tear-strip removed and the closure spread for removal.

Having reference now to the details of the drawing, I have shown a conventional bottle 6 having an annular shoulder or bead 7 adjacent the rim of the mouth of the bottle. My improved crown cap 8 has a central circular cap portion 9, and an annular flange 10 to be crimped upon the bead 7 in the usual manner to provide a locking engagement between the cap and the bottle. The cap 8 may be provided with a cork or foil insert to effect a better seal, but such inserts easily rupture when the backing cap portion 9 is ruptured, and are not illustrated as being only conventional supplements to the invention.

A tear-strip 12 is formed upon the cap portion 9 by the usual manner of indentation along in-

tended lines of rupture. As clearly shown in Fig. 2, illustrating the cap as a blank, the lines of rupture 13 and 14 which form the tear-strip 12 start at spaced marginal points 15 and 16 on the central cap portion 9 and depart from these points at acute angles to the margin of the portion 9, and traverse the portion 9 to converge at a position 17 on the opposite margin of the portion 9. Preferably, the convergent position 17 is diametrically opposite some point lying between the points 15 and 16, so that neither of the segments 18 and 19 into which the tear-strip 12 divides the circular portion 9 has an arc exceeding 180 degrees. Preferably, also, the lines of rupture 13 and 14 follow arcuate courses proximately following one side of the portion 9 and thereby define a tear-strip having a form somewhat resembling the blade of a sickle. It is not, however, requisite that the lines 13 and 14 follow any particular course, as they might be closer to or farther away from the margin of the cap portion 9 than shown; but it is advantageous for purposes of winding as hereinafter described that they be gently curved rather than sharply curved or angulated, and that for the greater part of their length they converge gradually if at all, being initially substantially parallel, to provide a tear-strip which may wind upon itself rather than twist and which is not easily torn across.

From the points 15 and 16, lines of rupture 21 and 22 are formed in the flange 10, leading directly to the nearest margin of the flange and so defining an extension 23 of the tear-strip 12 across the flange. From the flange margin of the tear-strip extension 23 there extends a handle or tab 24, the sides of which are in alignment with the lines of rupture 21 and 22. For facility in manufacture, as by a simple stamping process, the tab 24 is of one piece with the rest of the cap, but it may be added and made integral therewith as by welding. If so added, it may be of thicker material or have thickened or rounded margins to provide a more secure and comfortable grip.

When the cap 8 is crimped upon the bottle 6, the tab 24 may either be bent down in contact with the bottle-neck or be folded up in contact with the tear-strip extension 23 and then folded flatly upon the cap portion 9. In the latter position it will not interfere with stacking caps in a capping-machine.

To open a bottle closed with my improved cap, the tab 24 is brought to a position radial to the bottle as shown in Fig. 3 and then is pulled or twisted slightly in the direction to follow the course of the tear-strip 12. This initial pull or twist will exert a strain upon the line of rupture 21 before exerting it upon the line of rupture 22, and these flange-lines will rupture one after the other, requiring the application of less force than would be required to rupture them simultaneously. Once the lines of rupture have been started, they will thereafter yield more easily, and the entire operation of removing the cap is such as to induce the operator to start twisting the handle towards the tear-strip 12 instead of trying to pull loose the tear-strip extension 23 by straight upward pull. Continued twisting of the tab 24, in the generally familiar manner of rotating a can-opening key, will cause the line of rupture 13 to start to break and then cause the line of rupture 14 to start, again giving the me-

chanical advantage of overcoming consecutive rather than concurrent resistances. Once the lines of rupture 13 and 14 have been started, the tear-strip 12 may easily be wound upon itself to the position 17, and separated from the cap. The cap segments 18 and 19 may then be spread and removed from the bottle as each will engage less than 180 degrees of arc of the bead 7.

The ruptured cap 8 may not be replaced to seal the bottle, and therefore it will indicate that the bottle has been opened after being sealed. If the narrow segment 18 is simply bent back without removing the wider segment 19, sufficient rim space is available for pouring from the bottle, while the segment 19 still serves to make difficult the access of dirt or insects to the bottle.

Having now described and illustrated a preferred embodiment of my invention as an example, I wish it understood that changes and alterations falling within the scope of the appended claims are to be considered as alternative embodiments of the spirit of my invention.

I claim:

1. A rupturable crown cap for a bottle, having a disc portion and a peripheral flange, the flange having a radial tab on the margin thereof, and a tear-strip having a first portion starting at said tab and integral therewith and extending across said flange in extension of a radius of said disc portion, and having a second portion extending circuitously around the disc portion of said cap to a point diametrically opposite to said first portion and there terminating, the first and second portions of said tear-strip being joined at a sharp angle approaching a right angle.

2. As a blank for the manufacture of a crown cap: a circular disc having a circular central portion for closing the mouth of a bottle or like container, and having a marginal portion adapted to be crimped as a flange to engage the rim of said container mouth and a tab extending radially from said marginal portion, said disc having indentations forming two lines of rupture extending in alignment with the sides of said tab across said marginal portion and then extending into said central portion at a sharp angle to said tab so as to form abrupt angles of departure at the inner edge of said marginal portion and convergently, proximately following one side of said central portion to a point on the edge of said central portion diametrically opposite to said tab.

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