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CLOSURE

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Fig. 1.

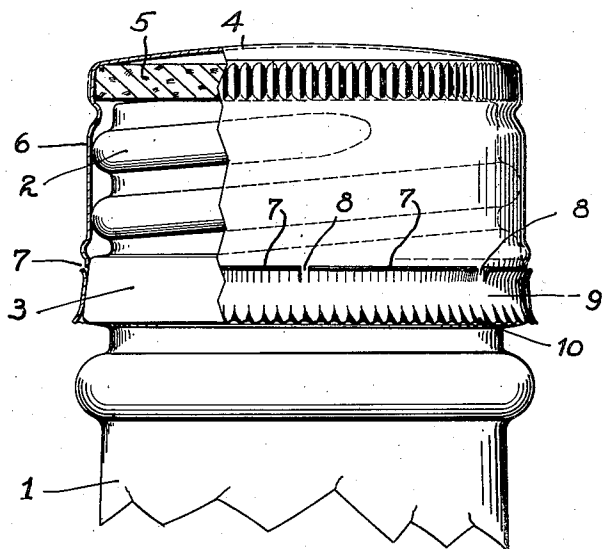
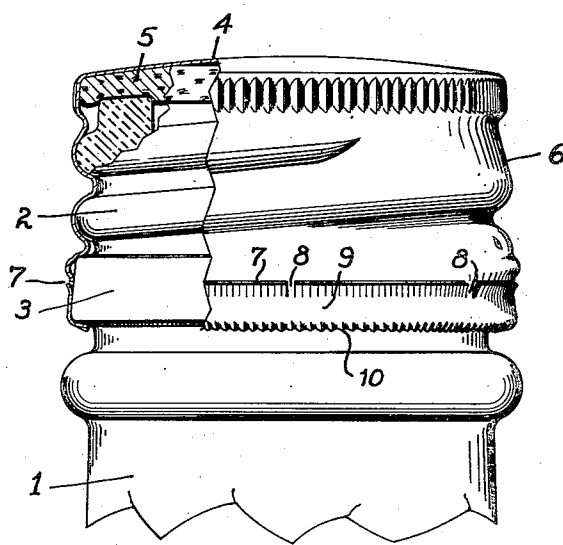


Fig. 2.



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CLOSURE

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3 Claims. (Cl. 215—7)

This invention relates generally to closures for bottles and similar receptacles and it concerns, more particularly, a closure having a portion adapted to be fractured upon loosening or removal of the closure from the bottle and so to indicate that the bottle has been opened.

A tamperproof type of closure well known in the art comprises a one-piece cap having an upper reclosure portion threaded to conform to the configurations of a bottle or similar container and a lower band adapted to be bent under a shoulder on the neck of the container. The upper reclosure portion of the cap and the lower band are spaced apart but connected intermittently by a series of narrow frangible bridges disposed circumferentially about the periphery of the cap. Upon the relative movement of the reclosure portion and the band required to loosen or to remove the cap, the bridges are fractured, separating the reclosure and the band portions of the cap, and the consumer is thereby given notice that the package has previously been tampered with or opened.

In sealing the package, the closure is seated upon the mouth of the bottle, its side walls either being pre-threaded to match the threaded configurations of the container or pressed while in position on the container by a suitable mechanism into engagement with the bottle finish. The lower margin of the band then is turned under the shoulder of the container, usually by a rolling or spinning operation.

When made from ductile metal such as thin gauge aluminum, this closure is well adapted to be formed upon the mouth of the container. However, heavy gauge material and the rigid or less ductile metals such as the ferrous base metals which usually are provided with a coating of other material and of which tin plate, black plate, andterne plate are examples cannot be used effectively in the construction of the closure. When the lower margin of the band is turned under the shoulder of the bottle, as for instance by a rolling or spinning operation, the band, if formed of rigid materials or heavy gauge metal, becomes bowed or bulged outwardly. This not only mars the appearance of the closure on the mouth of the bottle but also quite often fractures the frangible bridges connecting the reclosure portion of the cap and the lower band, giving the package the appearance of having been opened and necessitating the replacement of the closure. By increasing the number of the bridges connecting the reclosure and the lower band portions, the closure can be strengthened against fracturing

while the band is being turned inwardly, but this does not avoid distortion of the closure and renders opening of the package by the ultimate user so difficult that the closure is impractical.

The object of this invention is to provide an improved closure of the tamperproof type. More particularly, the invention has for its object the provision of an improved tamperproof type closure having a reclosure portion and a band turned inwardly under a shoulder on the neck of a container and joined to the reclosure by a series of spaced bridges adapted to break upon relative movement of the reclosure portion and the band and thereby to give notice that the package has been tampered with or opened. A specific object of the invention is to provide such a closure provided with a band having a lower margin adapted to be turned inwardly under the shoulder of the container without fracturing the bridges connecting the band and the reclosure portion of the closure and without distorting the side walls of the band.

My invention is predicated upon the discovery that the lower margin of the band can be turned inwardly under the shoulder of a container without materially distorting or bulging the rest of the band outwardly and without fracturing the bridges connecting the band with the reclosure portion if the lower margin of the band is provided with vertical crimping. By this I mean that the lower margin of the band is formed into alternate ridges and furrows before being turned inwardly under the shoulder on the container finish.

It is necessary in the practice of my invention that the crimping be confined to the lower margin of the band. By the term "the lower margin of the band," I mean only that portion of the band which is to be turned inwardly under the shoulder of the container. During the inturning operation, the band is bent inwardly immediately above this lower margin, and the folds provided by the crimping need only be crimped further as the margin is rolled or compressed inwardly to accommodate this portion of the band to its final position under the shoulder of the container. Since less resistance is offered to the further crimping of these folds as the lower margin of the band is turned inwardly than is offered to the inturning operation by a band having the same structure but not having crimping, it is considered that the lower margin of the band which is provided by my invention is weakened by the crimping. The crimping should not be permitted to extend above this lower margin since the band,

if crimped above this margin and through the line along which bending is to take place, instead of being weakened, is strengthened against bending normal to the crimping and is caused to offer greater resistance to the forming operation.

An embodiment of my invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a side view partially in section of a closure in position on a container prior to being pressed or forced into engagement with the exterior surface of the container, and

Fig. 2 is a side view also partially in section of the closure illustrated in Fig. 1 after being pressed or forced into engagement with the container finish.

The closure illustrated in Figs. 1 and 2 is adapted to seal a container 1 having threaded configurations 2 on its neck adjacent its mouth and an annular shoulder 3 below the threaded configurations.

As shown in the drawing, the closure is cup-like in form and comprises a top portion 4 adapted to lie over the mouth of the container. The top portion 4 is generally provided with an internal sealing lining 5 of rubber or cork or other suitable material. Integral with the top portion 4 is a depending skirt 6 which lies adjacent the neck of the container, as shown in Fig. 1, and which may be pressed or forced into engagement with the container finish in the manner shown in Fig. 2. The top portion and its depending skirt form a reclosure which may be screwed on and off the mouth of the container.

Separated from the skirt 6 by a series of perforations or by spaces 7 extending around the periphery of the closure but integrally connected to the skirt by a series of narrow bridges 8 is a band 9. This band, in accordance with my invention, is provided about its lower margin with vertical crimping 10. After the closure is seated upon the mouth of the container in the manner shown in Fig. 1, the lower crimped margin of the band is turned inwardly by a rolling or spinning or other suitable operation, preferably at the same time as the skirt 6 is being pressed into engagement with the threaded neck of the container. This, as is shown in Fig. 2, secures the band against being lifted from its position adjacent the shoulder 3 of the container. Preferably the top of the closure is subjected to a downwardly exerted pressure while this operation takes place. This forces the top portion of the closure against the mouth of the container, causing the rim of the container mouth to be pressed into the lining 5, as is shown in Fig. 2, and providing a tight seal.

To open the package, the closure is unscrewed from the mouth of the container, causing the frangible bridges 8 to break. The upper reclosure portion thereby is separated from the band, which is secured against removal from the container by its intumed lower margin. The separation of the reclosure and the band by the breaking of the frangible bridges 8 thereafter gives notice that the package has been opened and warns the consumer of the possibility that there may have been tampering with the contents of the container since it was originally sealed.

The crimping 10 permits the lower margin of the band to be turned under the shoulder 3 of the container with a minimum of resistance and prevents the band from becoming distended and the bridges 8 from being fractured during the operation. The crimping also permits the clo-

sure to be constructed with fewer or weaker bridges 8; and having fewer or weaker bridges 8, the closure offers less resistance to the breaking of the bridges when initially unsealed and the package is more easily opened.

Still a further advantage of the crimping along the lower margin of the band resides in the fact that fracturing appears in the crimping should the lower margin be bent from under the shoulder of the container, and this gives the ultimate consumer even further notice that there has been tampering with the package.

While the closure may be made from any of the metals commonly used in making closures, the advantages of the crimping along the lower margin of the band are especially apparent when the closure is of tin plate, black plate, terne plate or other rigid metal. This is because distortion of the band and fracturing of the connecting bridges are especially common when caps made from such metals are subjected to rolling or spinning to turn them under the shoulder of the container. Even when the closure is constructed from other more ductile metals such as aluminum, however, there are still advantages in providing the lower margin of the band with crimping. Even then, the operation of turning the band under the shoulder of the container is facilitated by the crimping. Moreover, since less resistance is offered by the band to this operation, less stress is exerted upon the bridges connecting the reclosure and the band during the rolling or spinning step. Accordingly, fewer or weaker connecting bridges may be used. This permits a closure to be constructed which can be opened with a minimum of effort.

It will be understood that the invention is not limited to the form specifically illustrated herein but that it may be embodied in other forms as defined in the following claims.

I claim:

1. A cup-like closure adapted to be reformed on a container having an annular shoulder below its mouth, said closure having a skirt perforated at intervals about its periphery to divide the closure into an upper reclosure portion and a lower band, said band having a crimped margin adapted to be turned inwardly under the shoulder of said container without fracturing the closure between said perforations or distorting said band during the inturning operation, the crimping of said margin extending to the lower edge thereof and being confined to that portion of the band to be turned under said shoulder, said closure being adapted to fracture along said perforations upon relative movement of said reclosure portion and said band to loosen or remove said closure from the container.

2. A cup-like closure adapted to be reformed on a container having an annular shoulder below its mouth, said closure having a skirt perforated at intervals about its periphery to divide the closure into an upper reclosure portion and a lower band, said band having a vertically crimped margin adapted to be turned inwardly under the shoulder of said container without fracturing the closure between said perforations or distorting said band during the inturning operation, the crimping of said margin extending to the lower edge thereof and being confined to that portion of the band to be turned under said shoulder, said closure being adapted to fracture along said perforations upon relative movement of said reclosure portion and said band to loosen or remove said closure from the container.

3. In combination with a container having threaded configurations adjacent its mouth and an annular shoulder below said threaded configurations, a one-piece closure cap having a skirt conforming to the threaded configurations of said container and a band spaced from said skirt but integrally connected therewith by a series of frangible bridges about the periphery of the cap, said band having a crimped margin

5 turned inwardly under said shoulder, the crimping of said margin extending to the lower edge thereof and being confined to that portion of the band turned under said shoulder, said closure being adapted to fracture along said series of connecting bridges upon relative movement of said skirt and said band.

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