Aug. 20, 1968 W. E. TAYLOR 3,397,807

RECLOSABLE CAN

Filed July 17, 1967

Fig. 2

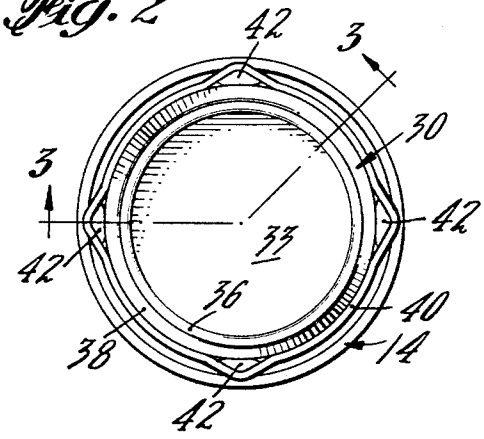


Fig. 1

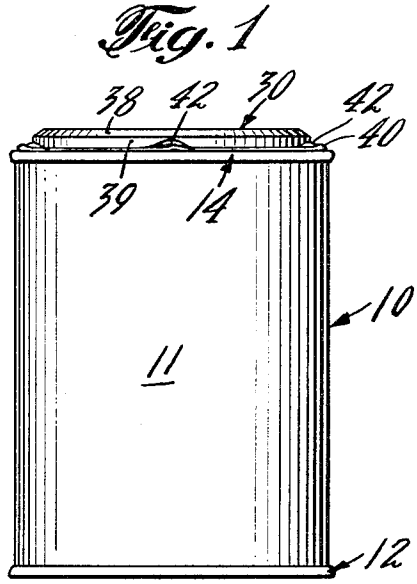
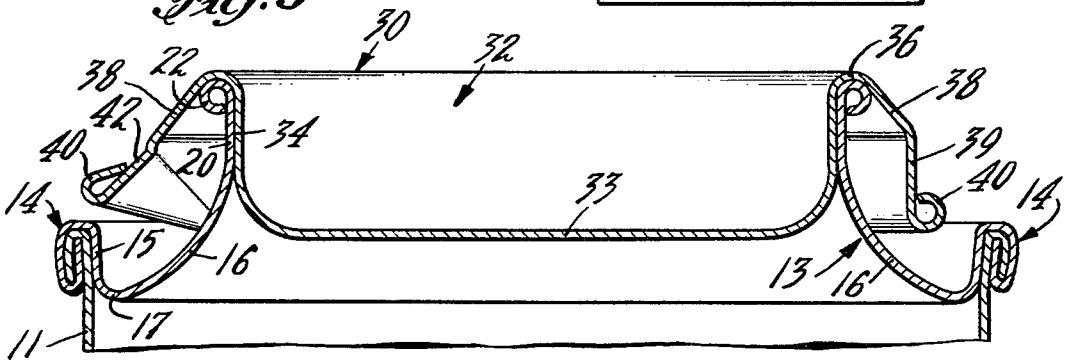


Fig. 3



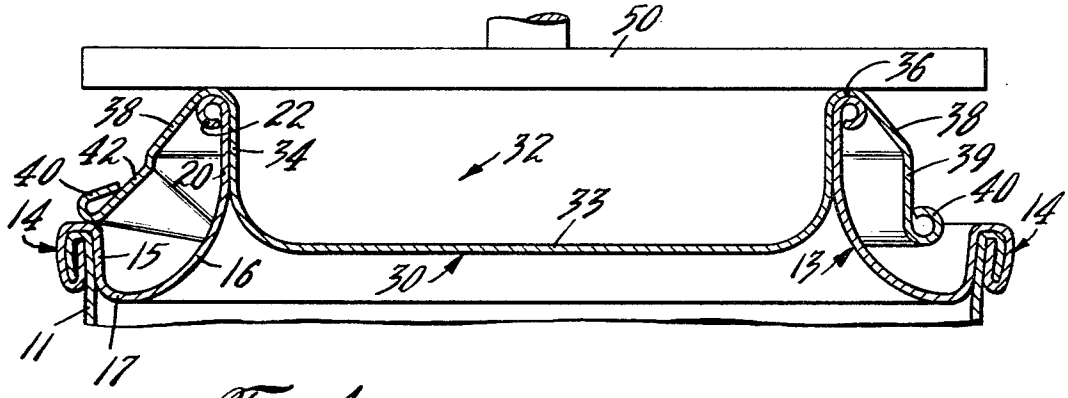


Fig. 4

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RECLOSABLE CAN

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ABSTRACT OF THE DISCLOSURE

A reclosable can of the type having an annular upwardly extending throat and a plug with an annular wall to engage the inner surface of the ring, has a plurality of lugs on the plug which engage the top of the double seam to prevent collapse of the throat due to over-assembly or an axial force applied to the lid during shipment or storage or by a shaking apparatus.

Background of the invention

One of the more familiar types of reclosable cans in use is one having a ring with an upwardly facing U-shaped channel seamed to the top of the can body and a plug having an annular U-shaped bead which fits snugly within the channel to effect a seal when the plug is pressed down upon the top of the can. Such cans are useful in applications where a large opening is desirable, as when the product is one such as paint, which must be accesible to a stirrer or brush.

Such cans have several inherent disadvantages. For one, the product is difficult to pour from the can because the U-shaped channel in the ring acts as a baffle to prevent controlled pouring of the product. Another disadvantage is that product invariably finds its way into the channel when poured or when a brush wet with the product is wiped on the ring, so that when the plug is pressed down onto the can to reclose it and the U-shaped bead on the plug descends into the U-shaped channel on the ring, the product retained in the channel splatters. Splattering, of course, is objectonable to the user. Lastly, reopening such a can is often somewhat difficult because product retained in the channel hardens after the plug has been replaced on the can and thereby makes subsequent removal of the plug from the can difficult.

All of the disadvantages discussed above have been overcome by designing a can with a ring having a raised annular throat which projects upwardly beyond the double seam and a plug having a recessed portion to provide a cylindrical friction wall which, at its outer surface, engages the inner surface of the throat to provide a seal. The cylindrical wall merges with a depending skirt which extends outwardly of the throat and terminates in a reenforced lower edge which is positioned adjacent the double seam so that a screw driver or other implement can be slid over the double seam to engage the lower edge of the skirt and be used to pry the plug off the can.

The raised throat permits controlled pouring because the product is poured out of the can directly without having to pass over a channel or any other obstacle in the ring. The absence of a channel eliminates the splattering problem and also eliminates the problem of difficult removal of the plug due to dried product being retained in the channel after prior use of the can. In addition, a can with a raised throat permits better "brush-off," that is, removal of excess paint from a brush by wiping it against the inner edge of the ring.

A can of the raised throat type is not without disadvantages. The upstanding throat is inherently weak, and therefore susceptible to permanent distortion when excess axial force is exerted upon the plug. If the axial force is high enough the throat will collapse enough to permit the downwardly extending skirt on the plug to become wedged between the throat and the countersink wall and thereby make subsequent removal of the plug almost impossible. High axial forces can occur during the closing operation unless the operation is carefully performed and also during storage or shipment because of axial loads exerted by cans supported above. Such forces can also occur if the can is used to package a product such as paint, which is mixed by placing the unopened can in a shaking machine to mix the product, because such machines having gripping elements which are tightened down on the can end and if advertently overtightened they will exert an axial force on the plug which is excessive.

Summary

The present invention has as its principal object the prevention of distortion to the throat on the ring of a reclosable can wherein the throat extends above the countersink wall when axial forces are exerted on the plug. Prevention of such distortion prevents the outer skirt from becoming wedged between the throat and the countersink wall, a condition which makes subsequent removal of the plug almost impossible. In accordance with this invention lugs are provided on the plug to abut against the top of the double seam when the plug is pressed down excessively to thereby transmit an axial load exerted on the plug to the can body and limit the axial force which can be exerted on the throat.

Brief description of the drawings

FIG. 1 is an elevational view showing a can made in accordance with the present invention;

FIG. 2 is a plan view of the can shown in FIG. 1;

FIG. 3 is an enlarged sectional view taken along the line 3—3 of FIG. 2 with the plug normally seated on the top of the can;

FIG. 4 is an enlarged sectional view showing the plug immediately after being forced downwardly by the presser plate of a can closing machine far enough to bring the stop lugs into contact with the top of the double seam.

Description of the preferred embodiment

There is shown in FIG. 1 a can indicated generally as **10** having a can body **11** which is closed at one end by a bottom end closure **12** seamed to the can body in a conventional double seam. As shown best in FIGS. 3 and 4, an annular ring **13** is seamed to the can body **11** at its upper end in a conventional double seam **14**.

The annular ring **13** includes a countersink wall **15** which forms the inner layer of the double seam **14** and at its bottom end merges into an inwardly and upwardly extending throat **16** which comprises a lower curved wall **17** and an upper cylindrical friction wall **20** which terminates at its uppermost end in an annular outwardly curled bead **22**.

A sealing plug, indicated generally as **30**, having a recessed central portion **32** defined by a bottom flat panel **33** and an upstanding annular wall **34**, is shown in FIG. 3 as seated on the can **10** so that the recessed portion **32** fits within the annular ring **13** with the outer surface of the plug wall **34** in sealing frictional engagement with the inner surface of the friction throat wall **20**. The annular wall portion **34** extends upwardly to an annular curved channel portion **36** which extends outwardly from the annular wall portion **34** and merges with an inclined flange portion **38** which in turn merges with an annular downwardly projecting skirt **39**. The skirt **39** terminates in an integral reenforcing bead or curl **40** which extends generally outwardly from the skirt **39**.

As shown in FIG. 3, when the plug **30** is fully seated

on the can **10** so that the outer surface of the annular wall **34** fits snugly against the friction wall **20** and the annular channel portion **36** engages the bead **22**, the plug can be pressed down no further without causing some distortion of the lower curved wall **17** of the throat **16**. As pointed out above, excessive distortion of the ring **13**, particularly at the friction wall **20** would make opening and reclosing the container difficult, if not impossible. This is especially true if the bead **40** and skirt **39** become wedged between the countersink wall **15** and the friction wall **20**.

In order to prevent permanent distortion of the ring **13**, stop lugs **42** are formed in the skirt **39** and extend outwardly therefrom as shown in FIG. 2. Each lug **42** extends outwardly far enough so that it overlies the double seam **14** and thus abuts against the top of the double seam **14** in the event the plug is pressed downwardly beyond the position of FIG. 3.

In FIG. 4, the arrangement of parts is shown immediately after a presser plate **50** of a closing apparatus has pushed the plug **30** downwardly until the lugs **42** have engaged the top of the double seam **14**. Because of the presence of the lugs **42**, the ring **13** is distorted only to a limited degree unless, of course, so much axial force is applied that the lugs **42** are bent or the body wall **11** is collapsed. As shown in FIG. 4, the curved wall **17** of the throat **16** is flattened somewhat by the pressure of the plate **30** so that it has less curvature than shown in FIG. 3, but there is no distortion of the friction wall **20** and the distortion of the curved wall **17** is not nearly enough to cause it to take a permanent set. As a result, the parts return to the position of FIG. 3, when the pressure exerted by the plate **50** is released. The reason for this is that this limited movement of the curved wall **17** which occurs prior to the time the lugs **42** engage the top of the double seam **14** is insufficient to cause the curved wall **17** to distort beyond its elastic limit.

The lugs **42** serve another purpose. Since they are located in close proximity to the double seam **14**, they indicate visually when the plug **30** has been pressed down to its optimum position. A large gap between a lug **40** and the top of the double seam **14** indicates that the plug **30** is not pressed down as far as it should be to provide optimum sealing, and a bent lug indicates that the closing machine is pressing the plug **30** too far down into its can **10**. Either instance gives indication that adjustment of the closing machine should be made. It is unlikely, however, that the latter condition would occur because as a rule, the presser plate of a closing machine is spring-backed, and while it could exert sufficient pressure to permanently distort the throat **16** if the lugs **40** were not present, it is not apt to exert sufficient force to bend the lugs **42**, or to collapse the can wall **11**.

The lugs also prevent excessive distortion of the ring **13** after the can has been closed as during shipment and storage, when axial loads are exerted on the plug by the weight of cans supported above.

Distortion of the ring **13** is also prevented when the can is mounted on a shaker apparatus to mix the product. Such an apparatus generally grips the can with elements which clamp against the can ends so that one of the elements exerts a downward force on the plug **30**. In the present can, the ring **13** will not be distorted and the clamping force will be transferred through the lugs **42** to the countersink wall **15** and can body **11**.

It is readily apparent that the foregoing describes only one embodiment of the present invention and that many modifications can be made thereto without departing from the scope of the present invention as defined in the following claims.

I claim:

1. A container comprising a can body, an annular ring joined to one end of the can body in a conventional double seam, a raised throat at the inner portion of said ring extending above said seam and providing a cylindrical friction wall, a plug, said plug comprising an annular wall fitting snugly inside of said friction wall, and a plurality of lugs projecting outwardly from said plug and overlying the top of said double seam when said plug is fully seated on said ring to protect said friction wall from excessive distortion when an axial force is exerted on said plug.

2. The container defined in claim **1** wherein said plug further comprises an annular channel portion extending outwardly from said annular wall and adapted to engage the top of said friction wall when said annular wall is fully seated on said ring, and an annular skirt extending downwrdly, said lugs being formed in said skirt and projecting outwardly therefrom.

3. A plug for a container of the type having an annular ring joined to one end of the container in an end seam and having a raised throat extending above said seam, said throat having a friction wall at its inner surface, said plug comprising an annular wall adapted to fit snugly within said friction wall, and a plurality of stop lugs extending outwardly from said annular wall to abut the top of said seam when said plug is pressed down upon said container.

4. A plug for a container of the type having a ring joined to one end of said container in an end seam, said ring having a raised throat extending above said seam to provide a friction wall at its inner surface, said plug comprising a recessed portion providing an annular wall to fit snugly within said friction wall of said throat, an outwardly extending annular flange portion merging with the top of said annular wall, an annular skirt merging with and extending downwardly from said flange portion, and a plurality of stop lugs, said lugs extending outwardly from said skirt and adapted to engage the top of said end seam when said plug is pressed down upon said container to stop the downward movement of said plug in time to prevent permanent distortion of said throat.

5. The plug defined in claim **4** wherein said lugs are formed in and merge with said skirt.

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