June 8, 1965 J. HENCHERT 3,187,930

PLASTIC PULL TAB TO METAL TEAR STRIP ASSEMBLY WITH A CURLED CONNECTION

Filed June 19, 1963

FIG. 1

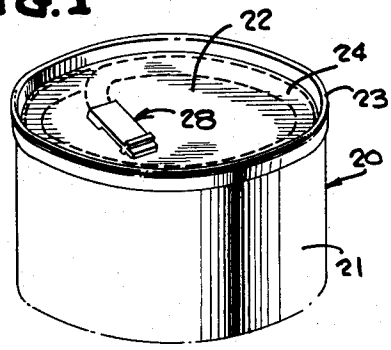


FIG. 2

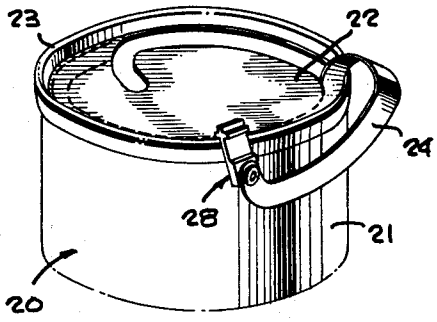


FIG. 3

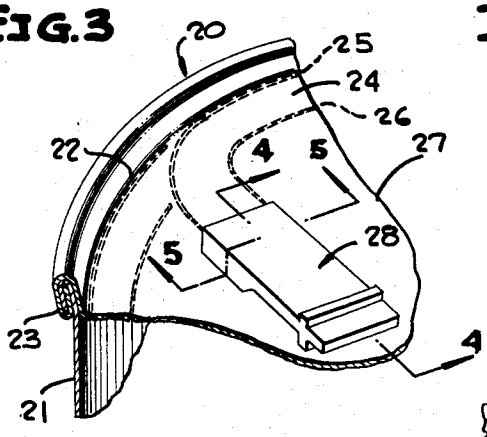


FIG. 6

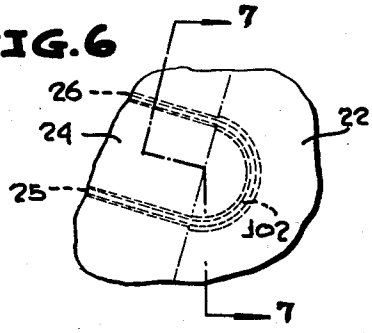


FIG. 7

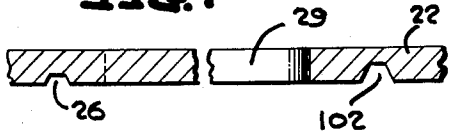


FIG. 4

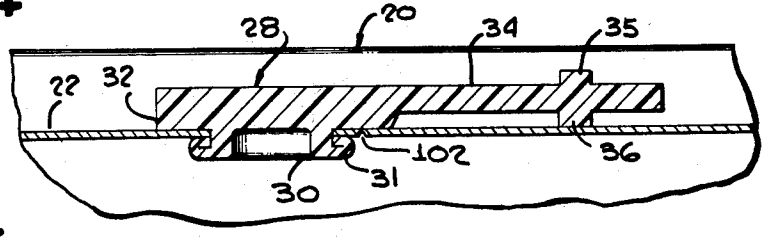
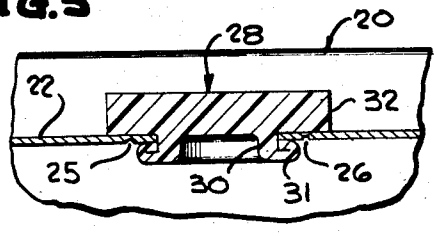


FIG. 5



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PLASTIC PULL TAB TO METAL TEAR STRIP ASSEMBLY WITH A CURLED CONNECTION

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Original application Feb. 10, 1961, Ser. No. 88,473, now Patent No. 3,151,766, dated Oct. 6, 1964. Divided and this application June 19, 1963, Ser. No. 289,013

4 Claims. (Cl. 220—54)

This application is a division of my copending application, Serial No. 88,473, filed February 10, 1961, now Patent No. 3,151,766, granted October 6, 1964.

This invention relates in general to new and useful improvements in means for opening containers, such as cans, and more particularly is directed to a novel tear strip arrangement for containers including metal can ends wherein a container may be opened by merely grasping a pull tab attached to a tear strip and removing the tear strip to thereby remove a panel of the container.

One of the primary objects of this invention is to provide a novel tear strip and pull tab combination wherein the pull tab is firmly anchored to one end of the tear strip and is of a greater width than the tear strip whereby the pull tab rests upon the associated container member on opposite sides of the tear strip to reinforce the tear strip at its starting end to eliminate the accidental rupture of the container member at the starting end of the tear strip.

Another object of this invention is to provide a novel tear strip and pull tab arrangement wherein the pull tab is provided with an end which is merely passed through an opening in the starting end of the tear strip and is thus interlocked with the tear strip, with the mechanical connection between the tear strip and the pull tab being sufficiently great to prevent the accidental removal of the pull tab from the tear strip during a tear strip removal operation.

A further object of this invention is to provide a pull tab and tear strip connection wherein the pull tab is provided with a simple boss which is passed through an opening in a tear strip and the boss upset to both form an interlock between the tear strip and the pull tab and to seal the opening in the tear strip.

Still another object of this invention is to provide a novel plastic pull tab and metal tear strip connection wherein the metal tear strip is provided with an opening through which a plug portion of the pull tab is passed, and after which the plug portion is curled to provide the necessary mechanical interlock between the pull tab and the tear strip.

This invention also proposes to provide means to facilitate the starting of the tearing of a tear strip from the adjacent metal whereby the tear strip is provided with a generally semi-circular end portion which is scored more deeply than side edge portions of the tear strip, whereby a lesser starting force is required to rupture the tear strip along the score lines.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a perspective view of an upper portion of a can having a metal can end which is provided with a tear strip and pull tab in accordance with this invention.

FIGURE 2 is a perspective view similar to FIGURE 1 and shows the tear strip partially removed.

FIGURE 3 is an enlarged fragmentary perspective view showing further the general details of the tear strip and pull tab combination.

FIGURE 4 is an enlarged fragmentary vertical sectional view taken along the line 4—4 of FIGURE 3, and shows the specific details of the connection between the pull tab and the tear strip.

FIGURE 5 is an enlarged fragmentary transverse vertical sectional view taken along the line 5—5 of FIGURE 3 and shows further the details of the connection between the pull tab and tear strip, including the fact that the pull tab overlies the metal can end on opposite sides of the tear strip to prevent the accidental rupturing of the can end along the outline of the tear strip by a downward pressure.

FIGURE 6 is a fragmentary plan view showing the general outline of the tear strip at the starting end thereof and the formation of the score lines defining the same.

FIGURE 7 is an enlarged fragmentary vertical sectional view taken along the line 7—7 of FIGURE 6, and shows the specific arrangement of the scores in the various portions of the metal can end along the outline of the tear strip.

Reference is first made to FIGURES 1, 2 and 3, wherein there is illustrated a conventional type of can which is generally referred to by the numeral **20**, and which includes a can body **21** and a can end **22**. The can end **22** is preferably formed of a light gauge metal, and it is desirable that the metal be easily rupturable. As a result, normally the can end **22** will be formed of aluminum, although the usual metals employed in the making of the can ends may be utilized. The can end **22** is secured to the can body **21** by a conventional seam **23**. The can **20** is illustrated and described only to set forth one environment of the invention. The present invention is not restricted to cans, but may be used in all types of containers, etc., where it is desired to remove a portion thereof without utilizing any opening equipment, such as a can opener in the case of a can.

Reference is now made to FIGURE 3 is particular, wherein the can end **22** is illustrated as having a circumferential tear strip **24** which is defined by a pair of score lines **25**, **26** with the score line **25** being disposed outermost and being disposed adjacent the seam **23** so that when the tear strip **24** is removed, substantially the entire can end **22** within the seam **23** will be removed. The score lines **25**, **26** are disposed generally in concentric relation for the most part of their lengths and the score line **26** generally defines an inner panel **27**.

The starting end of the tear strip **24** is provided with a pull tab, generally referred to by the numeral **28**. The pull tab **28**, as is best shown in FIGURES 4 and 5, is formed of a resilient deformable plastic.

The tear strip **24** has a simple opening **29** formed therethrough. The pull tab **28** has a tubular sleeve portion **30** which may be in the form of a hollow plug and which is passed through the opening **29**. That part of the sleeve portion **30** disposed below the tear strip **24** is reversely and outwardly curled, as at **31**, to form an enlargement **32** which directly underlies the tear strip **24** surrounding the opening **29**. It is to be understood that the formation of the enlargement **32** is such that a highly effective mechanical connection between the pull tab **28** and the tear strip **24** is formed. It is also to be noted that the enlargement tightly engages the underside of the tear strip **24** so that sealing of the opening **29** by portions of the pull tab **28**, including the sleeve portion, is assured with the seal being of a nature wherein it is suitable even for cans having products packaged therein under pressure. It is to be noted that the pull tab **28** is of a greater width than the tear strip **24** so that downward deflection of the tear strip **24** out of the plane of the can end **22** in the vicinity of the pull tab **28** is prevented.

Referring once again to FIGURE 4 in particular, it will be seen that the pull tab **28** has an elongated body

portion 34 which is thinner than that portion of the pull tab from which the plug portion 32 projects. The elongated body portion 34 is relatively resilient and in order to facilitate grasping of the pull tab to exert a tear strip tearing and removal force thereon, the body portion 34 is provided adjacent the end thereof remote from the plug portion 32 with an upper transverse rib 35 and a lower transverse rib 36. The ribs 35 and 36 are preferably aligned, and the rib 36 is of a thickness to sit on the upper surface of the can end 22 in the normal at rest position of the pull tab 28.

Reference is now made to FIGURES 6 and 7, wherein the details of the score lines defining the various tear strips at the starting end of each tear strip, are shown. For identification purposes only, the partial can end illustrated in FIGURE 6 will be considered to be the can end 22, and the tear strip, the tear strip 24. As was previously described, the tear strip 24 is defined by a pair of score lines 25, 26. As is best illustrated in FIGURE 7, these score lines 25, 26 are relatively shallow. The score lines 25 and 26 will preferably be of a depth so that the remaining metal to be torn in the removal of the tear strip 24 will have a thickness of 0.003 inch. The ends of the score lines 25, 26 are connected together by a generally semi-circular score line 102 which has a greater base width and is of a greater depth, as is best illustrated in FIGURES 6 and 7. The depth of the score line 102 will be such that in most instances, the remaining thickness of metal to be torn will range between 0.001 inch and 0.0015 inch. By making the score line 102 much deeper than the score lines 25, 26, it will be readily apparent that a sharp upward pull on the starting end of the tear strip 24 by means of the pull tab 28 will result in the rupturing of the metal of the can end 22 along the score line 102. Once the initial rupturing has been accomplished, the tear strip 24 may be removed by continuously exerting an upward pull thereon with the tear strip 24 being torn from the can end 22 along the tear lines 25, 26.

The advantage of the relatively deep score line 102 coupled with the supporting feature of the individual pull tab is obvious. Applicant has made the initially torn portion of the can end of sufficient weakness to facilitate the ease of tearing the starting end of the tear strip therefrom. On the other hand, by making each pull tab of a sufficient width to engage the can end outwardly of the tear strip, the tear strip is prevented from deflecting inwardly due to any accidental force exerted thereon, whereby the can 20 would be opened prematurely.

From the foregoing it will be seen that novel and advantageous provision has been made for carrying out the desired end. However, attention is again directed to the fact that variations may be made in the examples of the invention disclosed herein without departing from the spirit and scope of the invention, as defined in the appended claims.

I claim:

1. A tear strip assembly comprising a metal tear strip having a starting end, and a plastic pull tab, said tear strip starting end having an opening therethrough, and said pull tab having a plug portion extending through said tear strip opening and being outwardly folded at the lower end thereof and then reversely inwardly folded towards said tear strip to form first and second folds respectively, said second fold engaging said tear strip and together with said plug portion sealing said tear strip opening.

2. The tear strip assembly of claim 1 wherein said first and second folds are generally parallel to each other and to said tear strip, and said second fold having a terminal end opposing and being disposed closely adjacent to said plug portion.

3. The tear strip assembly of claim 1 wherein said first and second folds are generally parallel to each other and to said tear strip, and said second fold being in face-to-face engagement with said first fold.

4. The tear strip assembly of claim 1 wherein said pull tab is in the form of an elongated strip having a thick attaching portion from which said plug portion projects and a thinner grip portion, said grip portion having transverse ribs extending thereacross to facilitate gripping thereof.

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