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METAL END CLOSURE FOR CONTAINER BODY

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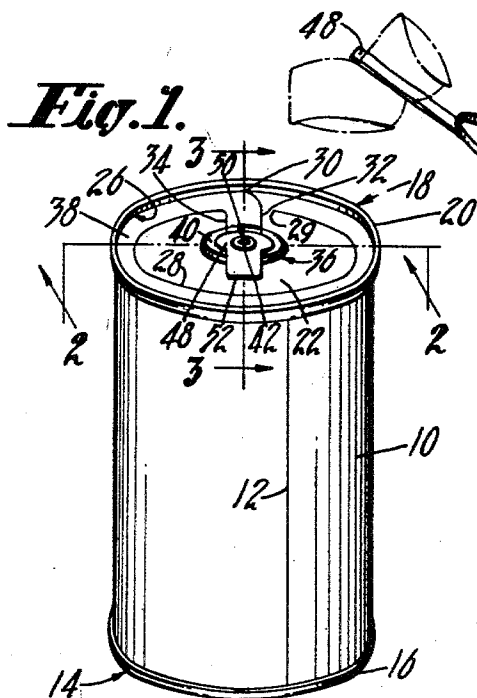


Fig. 5.

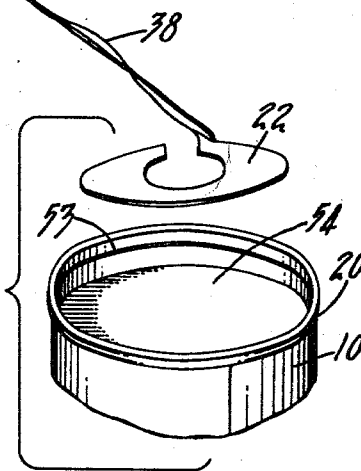


Fig. 2.

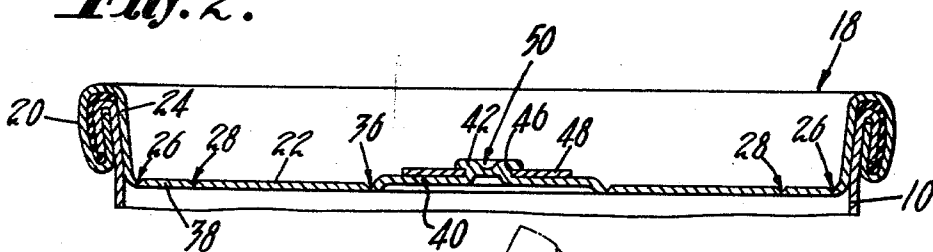


Fig. 3.

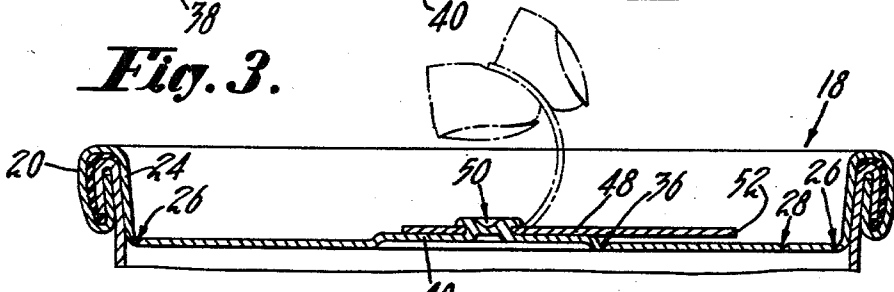
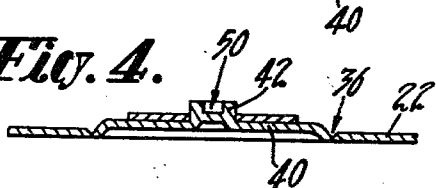


Fig. 4.



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METAL END CLOSURE FOR CONTAINER BODY
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4 Claims. (Cl. 220-54)

The present invention relates to an easily removable metal end closure for a container body. More particularly, it relates to a unique means of fastening a pull tab adjacent one end of a scored area within the metal end closure for easy removal of that portion of the closure defined by the score lines.

Metal end closures for container bodies, particularly tubular metal can bodies, which are adapted to be readily removed from the body by tearing out a scored area, are well known in the art. In general, the scored area in these prior art metal end closures is defined by a first pair of substantially concentric score lines adjacent the seam joining the end to the body; and a second pair of score lines joined to the first pair and extending inwardly towards the central portion of the end. Examples of such prior art are U.S. Patents 2,112,231 and 2,946,478.

The difference between various prior art disclosures over this general configuration outlined above lies in their varying means of freeing the inwardly extending ends of the second pair of score lines. While no severe technical problems exist in scoring the metal end closures in the manner outlined, the prior art has striven to simplify and improve the procedures for providing means for freeing the inwardly extending end of the tear strip.

It is therefore an object of the invention to provide a new and improved structure for freeing one end of a tear strip in a metal end closure for a container.

Another object is to provide a means for freeing one end of a tear strip of the character described which involves a minimum of manufacturing operations.

A further object is to provide a simple means for securely anchoring a pull tab to one end of a tear strip of the character described.

Yet another object is to provide a means for anchoring a pull tab to one end of a tear strip of the character described which is simple and efficiently accomplished with a minimum of extra operations and equipment.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

The above objects are achieved by providing for a tubular container body, a metal end closure having an embossment located towards the center of the closure, which embossment provides in effect an upstanding rivet extending through an aperture in one end of a pull tab, the upper surface of the embossment being flanged or flared outwardly over the periphery of the aperture to securely anchor the pull tab to the end closure. The embossment is located in proximity to the inwardly extending ends of spaced score lines, the opposite ends of which join or merge with a pair of spaced peripheral score lines in the closure. Upon lifting of the pull tab these inwardly extending score lines break through thereby releasing or freeing this end of the tear strip defined by the score lines so that upon continued pulling of the pull tab the tear strip is progressively removed from the closure with the resultant opening of the container.

Referring to the drawings:

FIGURE 1 is a perspective view of a container having the end closures of the instant invention;

FIGURE 2 is a sectional view taken substantially along line 2-2 of FIGURE 1;

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FIGURE 3 is a sectional view taken substantially along lines 3-3 of FIGURE 1 with the opening procedure shown in dot-dash lines;

FIGURE 4 is a fragmentary sectional view of the end closure immediately prior to the anchoring of the pull tab to the end; and

FIGURE 5 is an exploded view showing the end closure after removal from the can body.

As a preferred or exemplary embodiment of the instant invention, FIGURE 1 shows a tubular metal can body 10 preferably circular in cross-section. Can body 10 may be seamless such as being formed by impact extrusion or may be formed by interlocking the marginal edges of a flat blank in a manner well known to provide a longitudinal side seam 12. A lower end closure 14 is made integral with the can body 10 either by means of a conventional double seam 16 or in the case of an impacted extruded can, is of one piece with the can body 10. An upper end closure generally designated 18 is secured to the body 10 by means of a conventional double seam 20.

The end closure 18 comprises a countersunk central panel 22, which at its periphery merges with an upstanding countersink wall 24. The outermost periphery of the end 18 extends outwardly from the wall 24 to form a flange which is interfolded with a corresponding flange on the can body 10 to form the seam 20. A continuous score line 26 extends around the periphery of the panel 22 at the base of the wall 24. A score line 28 spaced concentrically inwardly from the continuous score line 26 extends in a circular path in the panel 22; but, unlike the score line 26, does not join itself forming a complete circle but ends at 29 for reasons explained more fully hereinafter. The score lines 26, 28 form a first pair of score lines.

At one point 30 in the length of the score line 26 a score line 32 diverges or forks from the score line 26 and extends radially inwardly towards the center of the panel 22. A score line 34 continuing from the end of the score line 28 adjacent the point 30 also extends radially inwardly towards the center of the panel 22 parallel with the score line 32. A score line 36 extending in a circular path around the center of the panel 22 connects the inner terminals of the score lines 32, 34.

It can thus be seen that the score lines 36, 34, 32, 28 and 26 define or enclose a removable area or tear strip 38 within the panel 22. It is to be understood that the inwardly extending pair of score lines 32, 34 need not extend radially inwardly but could extend into the panel 22 at any desired angle. Further, the score line 36, in connecting the ends of the score lines 32, 34, need not be located in the center of the panel 22 and may follow a path other than circular.

A first circular boss 40 extends upwardly from the panel 22 and includes the area for the most part enclosed by the score line 36. As with the score line 36, the boss 40 may have a configuration other than circular and need not be centrally located. However, this construction is preferred because of ease of tooling, registration and production. The boss 40 may be formed in any suitable manner, such as die-forming during the formation of the end 18, or by drawing after the end 18 is initially formed.

A second boss 42 extends upwardly from the center of the first boss 40. The boss 42 also may be struck from the end 18 by any suitable means such as die-forming or drawing. Whether the boss 42 extends upwardly from the boss 40 or from the unbossed panel 22 as mentioned hereinafter, it is essential to the instant invention that the boss 42 be located within the tear strip 38 adjacent the score line 36. This construction is necessary to permit rupture of the score line 36 during opening as explained more fully hereinafter.

The boss 42 extends upwardly through an aperture 46 in one end of an elongated grasping or pull tab 48. The

initial assembly of the pull tab 48 on the boss 42 is shown in FIGURE 4. The pull tab 48 is located on the panel 22 so as to extend beyond and substantially in alignment with the score lines 32, 34.

To firmly secure or anchor the pull tab 48 to the panel 22, the upper end of the boss 42 flares radially outwardly over the periphery of the aperture 46. This outward flare of the boss 42 is readily accomplished by swaging. To facilitate this swaging operation the center of the boss 42 has therein a hollow depression 50 as shown in FIGURE 4. The depression 50 is especially desirable when the end 18, including the boss 42, is composed of a relatively hard metal such as steel. However, if the end 18 is composed of a relatively soft metal such as aluminum, which is the preferred metal for the end 18, a depression 50 is not essential although it still facilitates the swaging operation.

As best shown in FIGURE 3 the free end 52 of the pull tab 48, i.e. the end remote from the aperture 46, is spaced from the panel 22. This spacing results from the mounting of the pull tab 48 on the first boss 40 with its free end 52 extending beyond the periphery of the boss 40. This upward displacement of the free end 52 of the tab 48 from the panel 22 provides a space into which one's fingers or a tool may enter to grasp this free end for lifting.

As shown in dot-dash lines in FIGURE 3, manual lifting of the free end 52 causes the tab 48 to pivot about the rivet-like boss 42 in a vertical direction. Such lifting stresses the score line 36 beyond its rupture or breaking point. In this manner the inner end of the scored area or tear strip 38 is freed from the panel 22 whereupon further upward pulling of the pull tab causes the tear strip to progressively tear along the score lines defining it. Score line 26 being continuous or endless will continue to tear until the panel 22 is completely separated from the remainder of the end 18 along line 53. Score line 28, however, ending blind at 29 will cause the tear strip 38 to remain attached to the panel 22. In this manner, when the score line 26 has completely torn through, the entire panel including the strip 38 will be removed from the body 10 as shown in FIGURE 5 to expose the canned product 54.

If desired, the first boss 40 may be omitted so that the pull tab 48 lies flush with the surface of the panel 22. However, with such a construction, it is preferred to turn the free end 52 of the tab 48 upwardly to facilitate grasping of this end.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In an end closure for a container having a tubular body, said end closure including a central panel, a peripheral portion integral with said panel and adapted to sealingly engage one end of said body in an end seam, the

inner surface of said closure facing toward the interior of said body, a first pair of spaced score lines surrounding at least a portion of said panel and disposed adjacent said peripheral portion, a second pair of spaced score lines continuing from said first pair of score lines and extending inwardly therefrom, a single score line joining each of said second pair of score lines at their inwardly extending ends, said score lines defining a continuous tear strip within said panel, and an elongated pull tab secured at one end to said tear strip adjacent said single score line; the improvement comprising a first boss extending outwardly from the outer surface of said panel, a second boss extending outwardly from said first boss through an aperture in one end of said pull tab, the outermost surface of said second boss being flared over the periphery of said aperture to secure said pull tab to said first boss, the free end of said pull tab extending beyond said first boss to provide a space between said free end and the subjacent portion of said panel whereby said free end may be manually grasped and lifted to break through said single score line and pulled to remove said tear strip from said panel to open said container.

2. The end closure set forth in claim 1 wherein said end seam extends above the level of said pull tab and said bosses.

3. The end closure set forth in claim 1 wherein said single score line extends arcuately around said first boss.

4. A metal end closure for a container comprising:

a central panel;

a removable area within said panel defined by score lines;

a first boss within said area adjacent one of said score lines;

an elongated pull tab having an aperture adjacent one end; and

a second boss extending outwardly from said first boss through said aperture and flanged over the periphery of said aperture to secure said one end of said pull tab to said first boss with the other end of said pull tab being free and extending beyond the edge of said first boss to provide a space between said free end and the subjacent portion of said panel, said pull tab adapted to be manually lifted to break through said one score line and pulled to remove said removable area from said panel to open said container.

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