

Sept. 13, 1966

J. HENCHERT

3,272,166

METHOD OF ASSEMBLING A PULL ELEMENT AND A CAN END

Original Filed Feb. 10, 1961

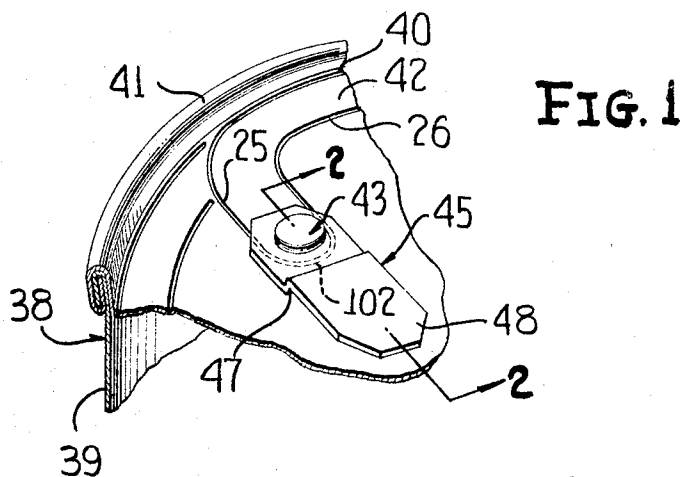


FIG. 2

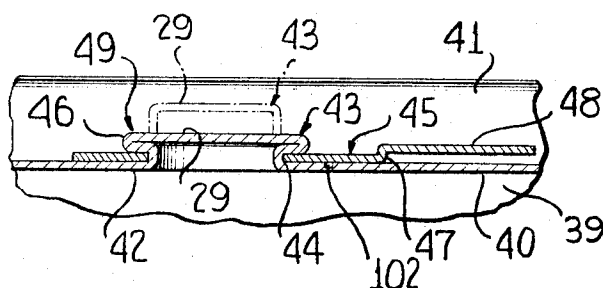
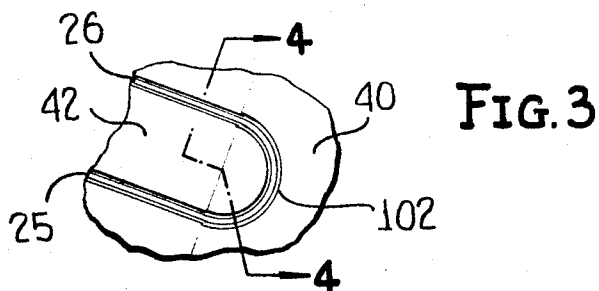
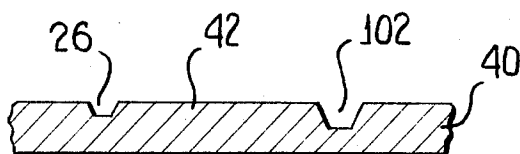


FIG. 4



INVENTOR
JOHN HENCHERT

BY
Mason, Porter, Miller & Stewart
ATTORNEYS

1

3,272,166

METHOD OF ASSEMBLING A PULL ELEMENT AND A CAN END

John Henchert, Oak Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y., a corporation of New York

Continuation of application Ser. No. 88,473, Feb. 10, 1961, now Patent No. 3,151,766, dated Oct. 6, 1964. This application May 7, 1964, Ser. No. 365,689
1 Claim. (Cl. 113—121)

This invention relates to a novel method of assembling a pull tab element with an end panel of a container, such as a can, to form a novel tear strip arrangement wherein a container may be opened by merely grasping the pull element attached to the tear strip and removing the tear strip to thereby remove the panel of the container.

This application constitutes a continuation of my co-pending commonly assigned application for U.S. Letters Patent, Serial No. 88,473, filed February 10, 1961, and now Patent No. 3,151,766.

A primary object of this invention is to provide a novel method of joining a first sheet-like element to a second sheet-like element of deformable material by forming an aperture in the first element, deforming the second element to form a hollow offset member integral therewith having a transverse wall and being of a length greater than the thickness of the first element, superimposing the first element on the second element with the offset member extending through the aperture, and thereafter forceably moving the transverse wall toward the first element to displace sufficient material outwardly of the offset member to form an outwardly directed circumscribing bead having a wall thickness substantially greater than the thickness of the transverse wall.

A further object of this invention is to provide a novel method of joining a pull tab to a tear out portion of a can end including the steps of forming an aperture in the pull tab, deforming the tear out portion to form a hollow offset member integral therewith having a transverse wall and being of a length greater than the thickness of the pull tab, and deforming the hollow offset member to provide an outwardly directed circumscribing bead having a thickness greater than the thickness of the transverse wall and overlying and engaging the defining edge portion of the aperture of the pull tab to effect the jointure between the pull tab and the tear out portion.

A still further object of this invention is to provide a novel method of joining a metallic sheet-like pull element to a metallic sheet-like can end panel comprising the steps of forming a score line in the end panel to at least partially define a tear starting end portion of a tear strip, forming an aperture in an end portion of the pull element, deforming a central portion of the end portion of the tear strip to form a hollow upwardly offset member integral therewith having a transverse wall and being of a length greater than the thickness of the pull element, inserting the offset member of the tear strip into the aperture with the end portions in contact and the end portion of the pull element overlying a portion of the score line adjacent the aperture, and forceably moving the transverse wall toward the pull element to displace material of the offset member outwardly of the aperture to form an outwardly directed circumscribing bead having a wall thickness at least twice the thickness of the transverse wall.

A final object of this invention is to provide a novel method including each of the steps immediately above set forth and including forming the score line of a differential depth including a deeper portion adjacent the aperture as compared to remaining portions of the score line whereby a lesser starting force is required to rupture the tear strip along the score line.

2

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 claim and the several views illustrated in the accompanying drawing:

In the drawing:

FIGURE 1 is an enlarged fragmentary perspective view of a can having an end seamed thereto, and illustrates the general details of a pull element secured to a tear strip by the novel method of this invention.

FIGURE 2 is an enlarged fragmentary vertical sectional view taken along line 2—2 of FIGURE 1, and shows the specific details of the connection between the tear strip and the pull element and the shape of a connecting portion of the tear strip in dotted lines prior to the reforming thereof in accordance with the practice of the method of this invention.

FIGURE 3 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 4 is an enlarged fragmentary vertical sectional view taken along the line 4—4 of FIGURE 3, and shows the specific arrangement of the score lines in the various portions of the can end along the outline of the tear strip.

Reference is now made to the drawing in detail wherein there is illustrated in FIGURES 1 and 2 a can, generally referred to by the numeral 38. The can 38 includes a can body 39 which has the upper end thereof closed by a can end 40 secured to the can body 39 by a seam 41 in the conventional manner. The can end 40 is provided with a tear strip 42.

The tear strip 42 is defined by a pair of score lines 25, 26 with the score line 25 being disposed outermost and being disposed adjacent the seam 41 so that when the tear strip 42 is removed, substantially the entire can end 40 within the seam 41 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 tear strip 42 is provided with an upstanding boss 43 which is received through an opening 44 in a pull element or pull tab 45 associated therewith. The boss 43 is initially upstanding, as indicating by dotted lines in FIGURE 2, and is preferably crimped, as at 46, to provide the desired mechanical interlock between the tear strip 42 and the pull element 45.

It is to be noted that the pull tab 45 remote from the tear strip 42 is vertically offset, as at 47, to define a grip portion 48. It is also to be noted that the width of the pull tab 45 is greater than the width of the tear strip 42 so that the pull tab 45 overlies the can end 40 outside of the area of the tear strip 42 at the starting end thereof to eliminate any accidental rupturing of the can end 40 by a downward pressure being exerted on the starting end of the tear strip 42. The pull element 45 may be formed of any suitable material such as plastic, but is preferably constructed from a light gauge metal, such as steel.

In accordance with the novel method of this invention, a plurality of can ends, such as the can end 40, are stamped from a sheet of metal in a conventional manner well known in the prior art and of itself, forming no part of this invention. Each of the can ends is then provided with the pair of score lines 25, 26 in an upper exposed surface thereof by a suitable score line forming operation, such as a punching operation.

The score lines 25, 26 are, for the most part, of a relatively shallow depth relative to the thickness of the end panel, as is best illustrated by the score line 26 of FIGURE 4 which illustrates the relationship between the score line 26 and the can end 40 highly exaggerated.

3

The score lines 25 and 26 are preferably of a depth so that the remaining metal to be torn in the removal of the tear strip 42 will have a thickness of approximately 0.003 inch. As is best illustrated in FIGURES 3 and 4 of the drawing, 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 than either of the score lines 25 or 26. This differential in score line depth and base dimension is accomplished by selectively punching or otherwise selectively forming the score lines. The depth of the score line 102 is such that in most instances, the remaining thickness of metal to be torn will range between 0.001 inch and 0.0015 inch. By this method of 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 portion of the tear strip 42 by means of the pull element 45 will result in the rupturing of the metal of the can end 40 along the score line 102. Once the initial rupturing has been accomplished, the tear strip 42 may be removed by continuously exerting an upward pull thereon with the tear strip 42 being torn from the can end 40 along the tear lines 25, 26.

The advantage of forming the relatively deep score line 102 is that the starting portion of the tear strip which is initially torn is of sufficient weakness to facilitate the ease of tearing thereof.

The boss 43 (phantom outline in FIGURE 2) is formed in the can end 40 prior to or after the formation of the score lines 25, 26 and 102, and is maintained in the upstanding position shown in FIGURE 2. The pull element 45 is then telescoped relative to the boss 43 to bring the portion adjacent the offset portion 47 into engagement with the end panel 40. It should be particularly noted that the portion adjacent the offset portion 47 extends radially beyond the score lines 25, 26 and 102, for a purpose to be described more fully hereafter. Once the elements 45 and 43 have been telescoped relative to each other, the offset portion 43 is crimped, as at 46, to provide the desired mechanical interlock between the tear strip 42 and the pull tab 45. This crimping is preferably accomplished by forceably moving a transverse wall 29 (FIGURE 2) toward the end panel 40 to displace the material of the offset 43 outwardly a sufficient amount to form an outwardly directed circumscribing bead 49 having a wall thickness substantially greater than the thickness of the transverse wall 29, as is best illustrated in FIGURE 2 of the drawing.

The circumscribing bead 49, since it is of a thickness substantially twice the thickness of the transverse wall 29, serves to reinforce the connection radially outwardly of the edge defining the aperture 44 in the pull member 45, and thus effects an efficient, sealed mechanical connection therewith. Furthermore, since the portion of the pull member 45 adjacent the circumferential or circumscribing bead 49 overlies portions of the score line 25, 26 and 102, as is best illustrated in FIGURE 2, any accidental rupturing of the can end 40 by a downward pressure being exerted on the starting end portion of the tear strip 42 is precluded. That is, the width of the pull member 45 is greater than the width of the tear strip 42 so that the pull member 45 overlies the can end 40 outside of the area of the tear strip 42 at the starting end portion thereof and any force directed downward against, for example, the transverse wall 43 is transmitted directly to the pull tab 45 and thereafter to the end panel or end 40 outwardly of the score lines 25, 26 and 102, as is readily apparent from FIGURE 1 of the drawing.

4

The assembled can end 40 and pull element 45 are then joined to a can body 49 by a conventional seaming operation to form the seam 41, thus completing the method of this disclosure.

It is to be noted that in some instances, the score lines 25, 26 and 102 defining the tear strip 42 can as well be formed in the under surfaces of the can end 40. It is also to be understood that if it is so desired, the score line 102 may be of the same depth as the score lines 25, 26, although this would make it more difficult to initially start the tearing of the tear strip.

It is also to be understood that the present invention is not intended to be limited to can ends, although this will most probably be the major use of the invention.

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 method set forth herein, as well as the article formed by the practice of the method, without departing from the spirit and scope of the invention, as defined in the appended claim.

I claim:

A method of joining a metallic sheet-like pull element to a metallic sheet-like can end panel joined by a seam to a container body comprising the steps of forming a score line in the end panel to define a tear starting end portion of a tear strip with the depth of the score line at the tear starting end portion being greater than the depth of the score line adjacent the starting end portion, forming an aperture in an end portion of the pull element, deforming a central portion of the end portion of the tear strip adjacent the deeper score line thereof to form a hollow offset member integral therewith having a transverse wall, a peripheral wall, a length greater than the thickness of the pull element and a diameter generally equal to the diameter of the aperture, relatively telescoping the offset member of the tear strip and the aperture with the end portions in contact and the end portion of the pull element overlying and projecting radially beyond the deeper scored portion of the score line adjacent the aperture with the pull element wholly confined within the area defined by said seam, forcibly moving the transverse wall toward the first element to outwardly displace sufficient material of the offset member to form an outwardly directed circumscribing bead having a wall thickness substantially greater than the thickness of the transverse wall and overlying engaging the defining edge portion of the aperture of said first element to effect the jointure between the latter and the second element.

References Cited by the Examiner

UNITED STATES PATENTS

2,029,329	2/1936	Ljungstrom et al. ... 220—52 XR
2,085,200	6/1937	Ljunstrom.
2,220,135	11/1940	Wardell.
2,753,075	7/1956	Geertsen ----- 220—54
2,753,624	7/1956	Taylor ----- 29—522
2,978,140	4/1961	Walsh ----- 220—52
3,059,808	10/1962	Clair ----- 220—54
3,067,910	12/1962	Adamsen ----- 220—54
3,130,489	4/1964	Schlage ----- 29—522
3,151,766	10/1964	Henchert.

CHARLIE T. MOON, *Primary Examiner*.

WHITMORE A. WILTZ, *Assistant Examiner*.