

Pearce et al.

[54] METHOD OF MAKING A PRESS TAB
CONTAINER END FROM A METALLIC
SHELL

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[58] Field of Search: 113/121 C, 80 DA, 120 A,
113/80 B; 220/54, 27

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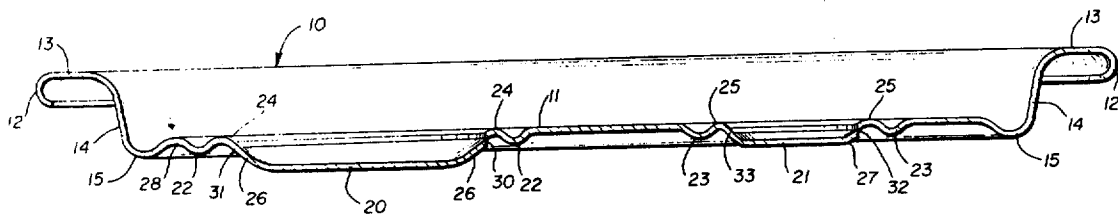
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[57] ABSTRACT

The method of making a press tab container end having a hinged pour opening closure tab and a hinged pressure release vent closure tab, from a metallic shell which has a generally flat center portion provided with a drawn and curled peripheral area for subsequent attachment to the container body, comprising the steps of forming and lancing the closure tabs in the shell, reforming the closure tabs to flatten and enlarge their areas, coining the tabs to further enlarge the tabs and cause them to underlie the metal of the shell surrounding the openings produced by the lancing step, followed by preheating the shells and applying sealant to cover the seam between the overlapping shell areas and tabs to provide an air and fluid tight seal on the under side of the container end.

3 Claims, 8 Drawing Figures



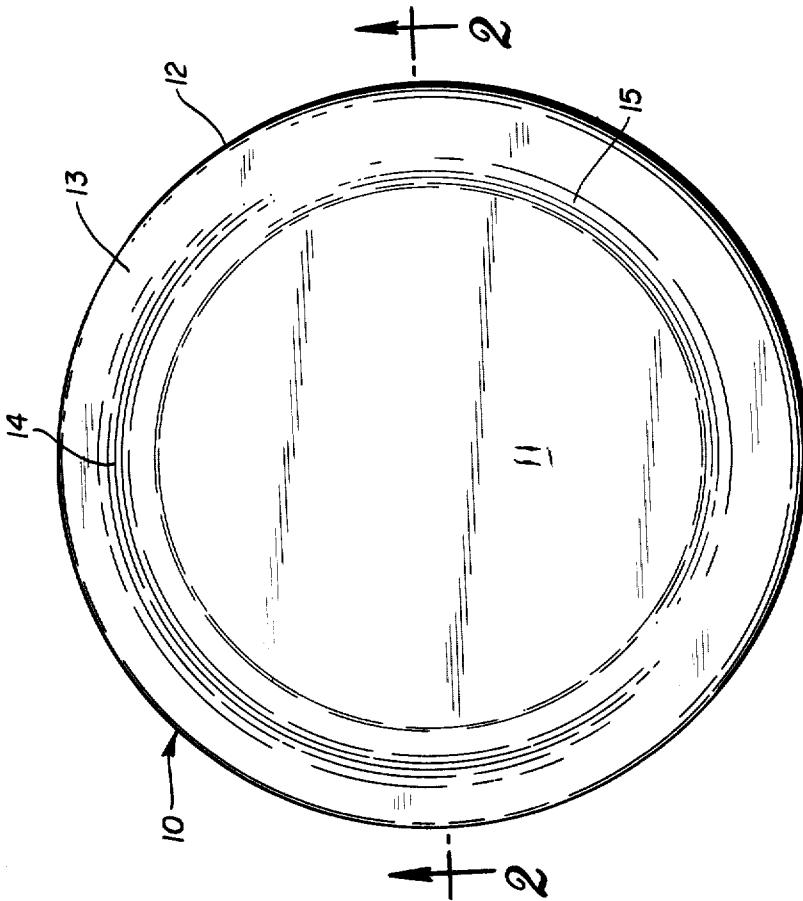


Fig. 1

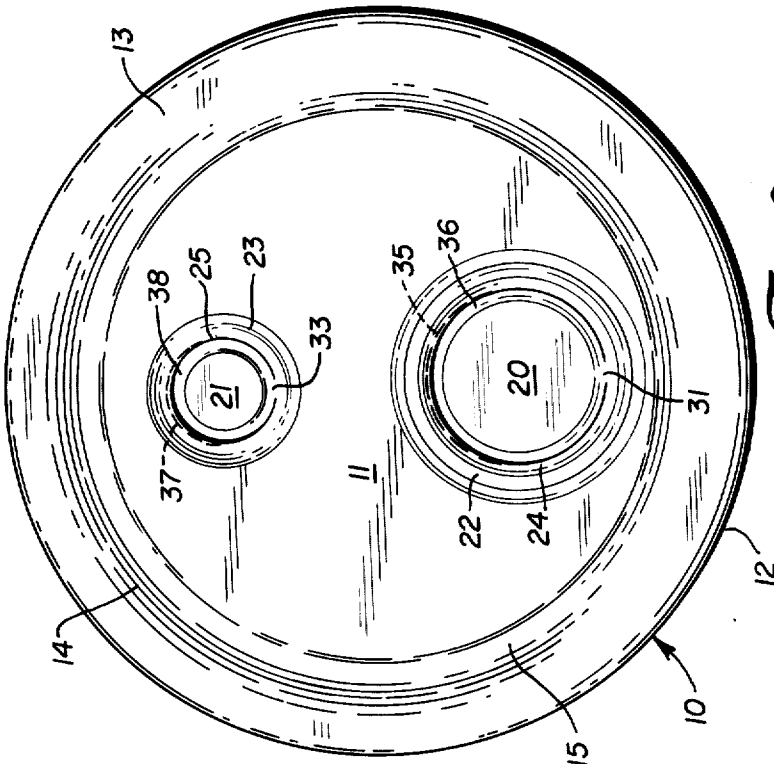


Fig. 8

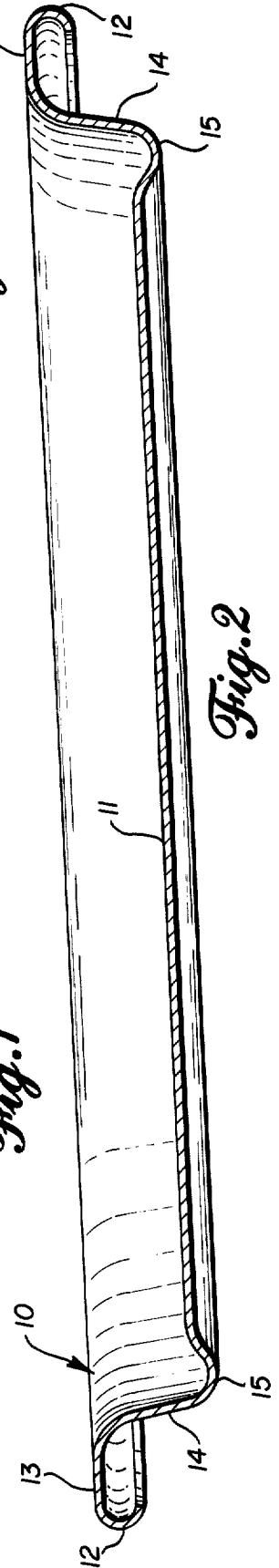
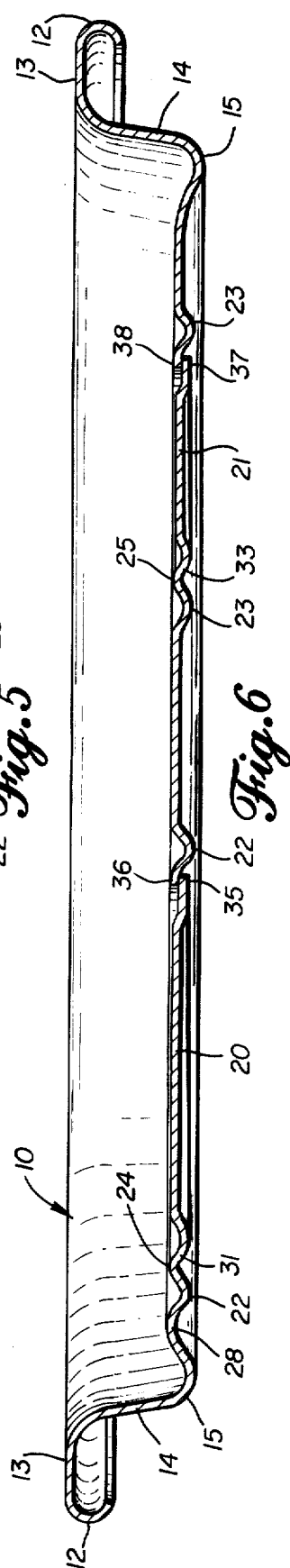
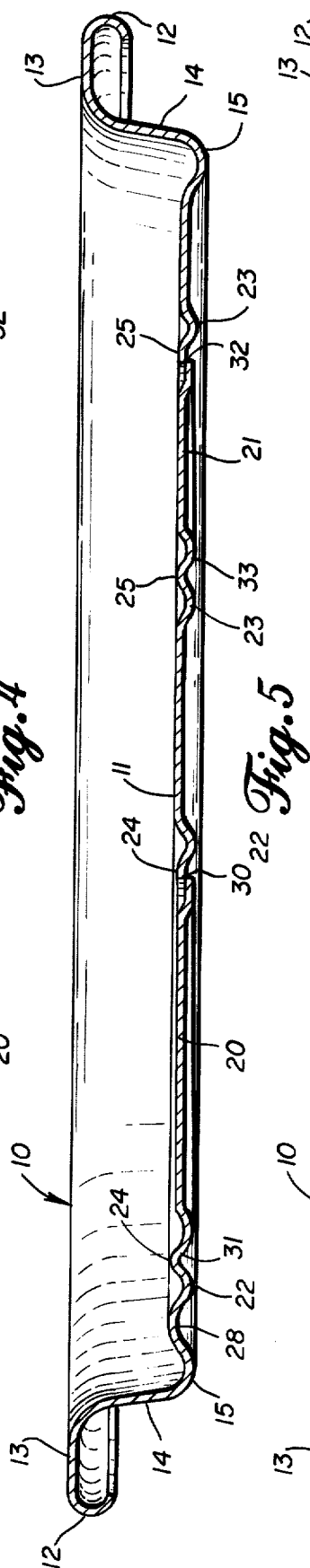
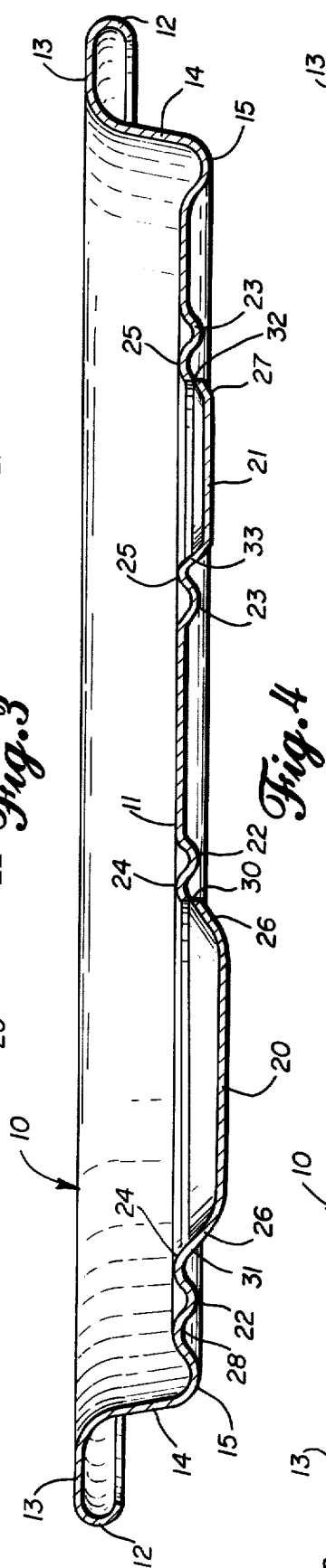
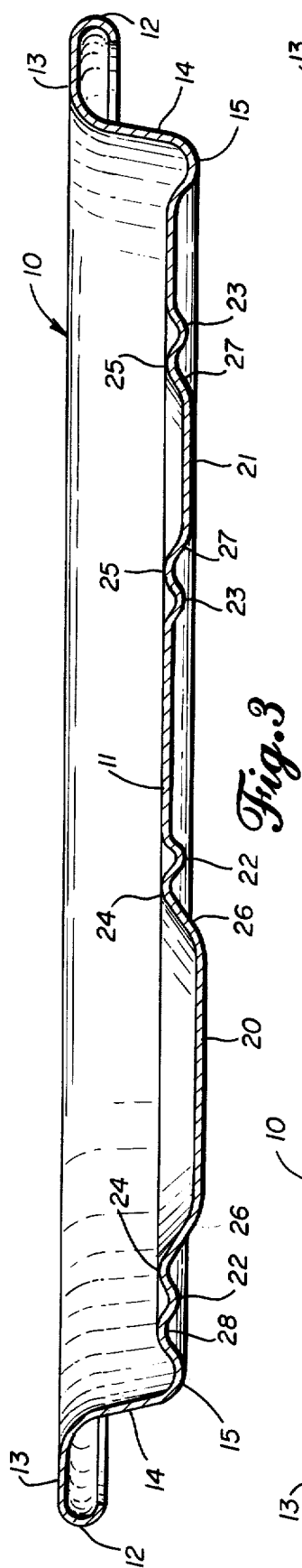


Fig. 2



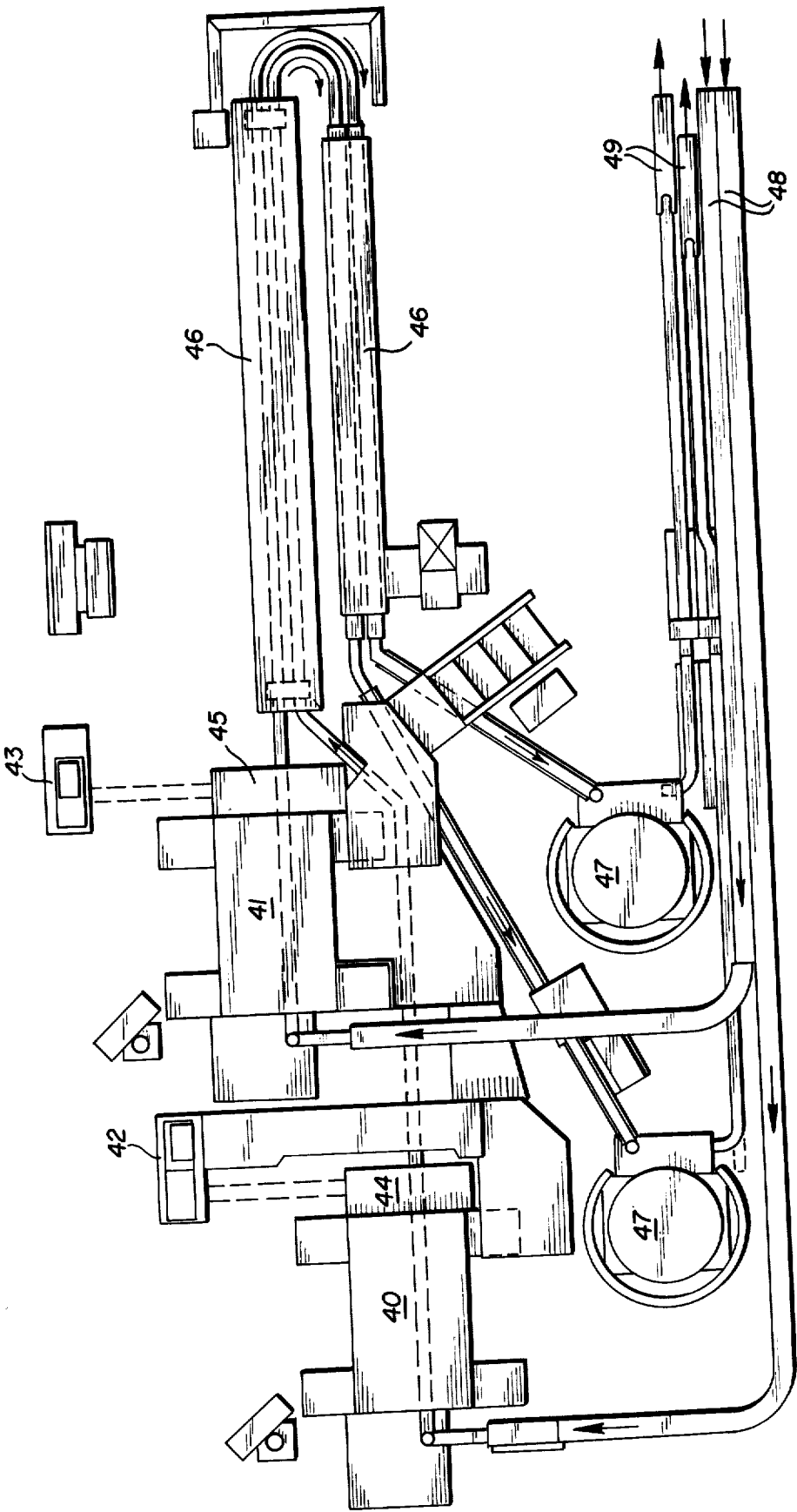


Fig. 7

METHOD OF MAKING A PRESS TAB CONTAINER END FROM A METALLIC SHELL

This invention relates to a method of making a press tab container end from a metallic shell, said end being provided with a pour opening closure tab and a pressure release vent closure tab, in which each of the closures is integrally hingedly joined to the container end, and said tabs sealingly but releasably close the pour opening and the pressure release vent. The closure tabs, referred to as press tabs, are manually depressible for the purpose of exposing the openings.

In the manufacture of containers such as cans and the like having a cylindrical body and one closed end, the separate end which becomes the cover for the open end of the container is called a shell. It comprises a flat circular center portion provided with a drawn peripheral edge area curled to receive gasket compound within the drawn and curled edge. The method of making a press tab container end from a metallic shell, embodying this invention, comprises the steps of forming the shell in a press to define a pour opening closure tab and a pressure release vent closure tab spaced from the pour opening closure tab, lancing the shell to separate the tabs from the rest of the shell area except in the hinge portions, reforming the lanced tabs to flatten and enlarge the tabs, and coining the shell to make the closure tabs underlie the edges of the metal surrounding the openings produced by lancing the shell. Thereby the tabs in completed ends bear against the lower surfaces of the ends and are prevented from being forced outwardly through the openings by internal pressure of the container contents such as beer and carbonated beverages. A sealant is applied to inner surfaces of the overlapping portions of the tabs and container end after preheating of the shells to provide an air and fluid tight seal.

Prior art patents disclose container ends provided with one or two tabs which close openings described as pour openings or air intake openings, and some disclose sealants for application to the inner or outer surfaces of the container ends. In the Jack patent U.S. Pat. No. 2,261,117, the sealant for a single tab is described as a metallic or plastic coating, or separate overlays of coated fabric or paper or annuli or cementing rings. Other prior art patents disclose liftable tabs on the container ends, or openings covered by adhesive coated paper or fabric, as in the Benchert U.S. Pat. No. 3,251,515. These have been found deficient in practice.

The object of this invention is to provide an efficient method of producing a press-tab container end from a shell previously drawn and curled in its peripheral area which has gasket compound applied to the said curled area, for attachment of the finished end to a container.

Another object is to perform the first two of the aforementioned operations, namely, the forming and lancing of the closure tabs in the shell, either simultaneously or successively, followed by the steps of reforming and coining the shell for the purpose of flattening the lanced tabs to thereby enlarge their areas, and to make the tabs underlie the metal of the shell surrounding the openings. The steps of forming, lancing, reforming and coining may be performed successively in separate strokes of a press, or may be combined in a single stroke or strokes of a press.

Another object of the invention is to apply sealant to the overlapping edges of the shell and closure tabs after pre-heating the end to a degree compatible with that of the sealant, approximately 160°-250° F. The application of the sealant to the pre-heated shell has a cumulative temperature effect that eliminates the need for post-heating of the coated shell after application of the hot melt sealant in order to obtain efficient adhesion and an air and fluid tight seal.

Another object of the invention is to employ a sealant applicator by which the sealant is projected from the applicator onto the closure and adjacent shell surface in the configuration required for the seal which is generally circular but not necessarily so limited. The sealant may be deposited in droplets from a multi-orificed nozzle or in a homogeneous layer conforming generally to a predetermined pattern dictated by the shape of the closure tabs.

In the drawings:

FIG. 1 is a top plan view, on an enlarged scale, of the shell from which the container end of this invention is produced.

FIG. 2 is a transverse vertical sectional view on an enlarged scale, in the plane of the line 2-2 of FIG. 1.

FIG. 3 is a transverse vertical sectional view on an enlarged scale, showing the shell after the forming operation by which the pour opening closure tab and the pressure release vent closure tab are formed in the shell.

FIG. 4 is a view similar to FIG. 3, showing the formed shell after it has been lanced to sever the tabs from the surrounding shell area except in the hinge portions by which the tabs are connected to the shell.

FIG. 5 is a view similar to FIG. 4, showing the result of the reforming steps of the method by which the tabs are flattened and spread.

FIG. 6 is a view similar to FIG. 5, showing the container end after the coining step of the method whereby the tabs are spread to underlie the surrounding shell areas.

FIG. 7 is a diagrammatic view showing two presses and associated mechanism for applying a sealant, cooling, testing and bagging the container ends.

FIG. 8 is a top plan view of the finished container end produced by the method of this invention.

In the embodiment of the invention shown in FIGS. 1 and 2 of the drawings, a metallic shell 10, preferably aluminum, consists of a generally flat center portion 11, having a drawn and curled peripheral area comprising an outer downwardly and inwardly curved edge 12, top surface 13, and downwardly and inwardly extending annular wall 14 merging into the curved bead 15. Gasket compound (not shown) is applied to the shell 10 within the drawn and curled peripheral edge, for mounting of the finished end on the body of the container.

After the shell has been prepared as hereinabove described and shown in FIGS. 1 and 2, the shell is subjected to the steps of forming the tabs and surrounding metal, lancing the tabs, reforming the tabs to flatten and enlarge their areas, and coining the tabs to further spread them and make the tab edges underlie the metal surrounding the openings.

In FIG. 3, the pour opening tab is designated 20 and the pressure release vent tab is designated 21. The forming step is performed in a press which forms an open top groove 22 around the tab area 20 and a simi-

lar groove 23 around the tab area 21. An annular rib 24 is located slightly inwardly of the groove 22 and a similar rib 25 is located slightly inwardly of the groove 23. An inclined annular part 26 of the tab 20 merges with the lower and flat portion of the tab 20 and the rib 24. An inclined annular part 27 of the tab 21 merges with the lower and flat portion of the tab 21 and the rib 25. Due to the location of the larger tab 20 and surrounding rib 24 and groove 22 closely adjacent the bead 15, a slight bulge 28 appears at the left of the shell of FIG. 3 which is not apparent at the right of the smaller tab 21, but the form of the shell is substantially the same in the areas surrounding the press-in tabs.

The lancing of the tabs 20 and 21 takes place after the forming step of FIG. 3. As shown in FIG. 4, the closure tab 20 is lanced at 30 to separate it from the shell except at the hinge area 31, and the closure tab 21 is lanced at 32 to separate it from the shell except in the hinge area 33.

Following the lancing step, the shell is reformed to flatten the tabs 20 and 21 with inclined annular surfaces 26 and 27, to enlarge or spread the tab areas, as shown in FIG. 5.

Thereafter, the reformed shell is subjected to a coining step whereby the tab areas 20 and 21 are spread a little more to make the edges of the tabs underlie the metal of the shell surrounding the openings produced by the lancing step. This produces overlaps of parts 35, 36, with respect to tab 20, and of parts 37, 38, with respect to tab 21.

FIG. 7 shows the press and associated mechanism employed to complete the shell. In this embodiment two presses are shown, side by side, for performing the same steps on two shells. The presses are indicated by the numerals 40, 41. Sealant supplies 42, 43 lead to sealant applicators 44, 45, respectively. Preferably the shells are pre-heated to temperatures compatible with the melting temperature of the sealant, approximately 160°-250° F., before the sealant is applied, thus taking advantage of the cumulative temperature effect of the heated shell and the sealant over the post heating of the unheated shell and sealant, to ensure proper adhesion.

Thereafter, the completed container ends are conveyed to a cooler or coolers 46, testers 47 and baggers 49. The infeed of the shells to the presses is designated 48.

The pre-heating of the shell after it leaves the press and before the application of the sealant may be done by an induction coil (not shown) or other suitable means. Post heating of the sealant coated shells may be done, but this requires heating both the sealant and the shell, whereas the preferred procedure of this method minimizes the heat treatment by pre-heating the uncoated can ends and utilizing the melting temperature of the sealant to augment and maintain the temperature of the coated can ends to ensure adhesion. Application of a cold sealant of the washer configuration followed by post heating the end may be employed. The sealant may be a hot melt, tape, film, or other sealant.

We claim:

1. The method of making a press tab container end from a metallic shell, said end having a hinged pour opening closure tab and a hinged pressure release vent closure tab, which comprises the steps of

a. providing a metallic shell consisting of a generally flat central portion and a peripheral drawn and curled area which has gasket compound in said drawn and curled area,

b. forming in the shell an upwardly opening circular groove surrounding each of the proposed areas of a pour opening closure tab and a pressure release vent closure tab, and forming a rib located radially inwardly of each of said grooves,

c. lancing the metal slightly radially inwardly of the top of said ribs to cut the tab areas and small circumferential parts of said ribs from the shell excepting where the tabs are joined hingedly to the shell,

d. reforming the shell to flatten and enlarge the tab areas,

e. coining the reformed shell to make the tab edges underlie surrounding shell areas, and

f. applying a sealant to the shell to cover the seam between the overlapping tabs and surrounding shell surfaces to provide an air and fluid tight seal.

2. The method defined by claim 1, in which the shell is heated to approximately 160°-250° F. before the sealant is applied.

3. The method defined by claim 1, in which the sealant is applied in a generally circular pattern in droplets which form a homogenous layer.

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