

- [54] **METHOD OF MAKING A PRESS TAB
CONTAINER END FROM A METALLIC
WEB**
- [75] Inventor: **Thomas R. Herrmann**, Wheat
Ridge, Colo.
- [73] Assignee: **Coors Container Company**, Golden,
Colo.
- [22] Filed: **Dec. 3, 1973**
- [21] Appl. No.: **421,160**
- [52] U.S. Cl. **113/80 R; 113/121 C**
- [51] Int. Cl. **B21d 51/00**
- [58] Field of Search **113/121 C, 121 R, 1 R,
113/80 R, 1 G, 15 D; 220/54, 48; 72/404**

[56] **References Cited**

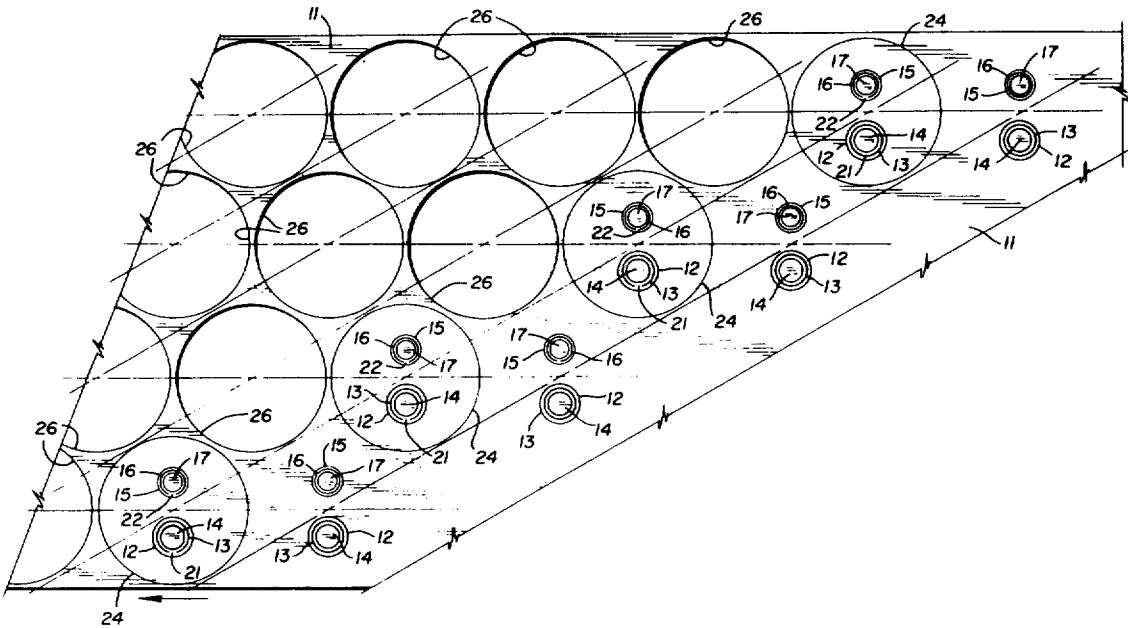
UNITED STATES PATENTS			
3,191,564	6/1965	Fraze	220/54
3,251,515	5/1966	Henchert	220/48
3,759,206	9/1973	Dalli et al.	113/121 C

Primary Examiner—Richard J. Herbst
Attorney, Agent, or Firm—Bertha L. MacGregor

[57] **ABSTRACT**

The method of making a press tab container end from a metallic web, said container end having a hinged pour opening closure tab and a hinged pressure release vent closure tab, which comprises the steps of forming and lancing said closure tabs in a batch of said ends which are parts of a metallic web lay-out, blanking out areas of the web each including said tabs, subjecting the blanked out areas to drawing of the peripheral portions, reforming the areas to flatten and enlarge the tabs, and making the tabs and tab surrounding edges overlap by coining, following by subjecting the ends to a curling and gasket insertion operation, and applying a sealant to cover the seam between the overlapping tabs and end areas to provide an air and fluid tight seal on the underside of the container ends.

13 Claims, 9 Drawing Figures



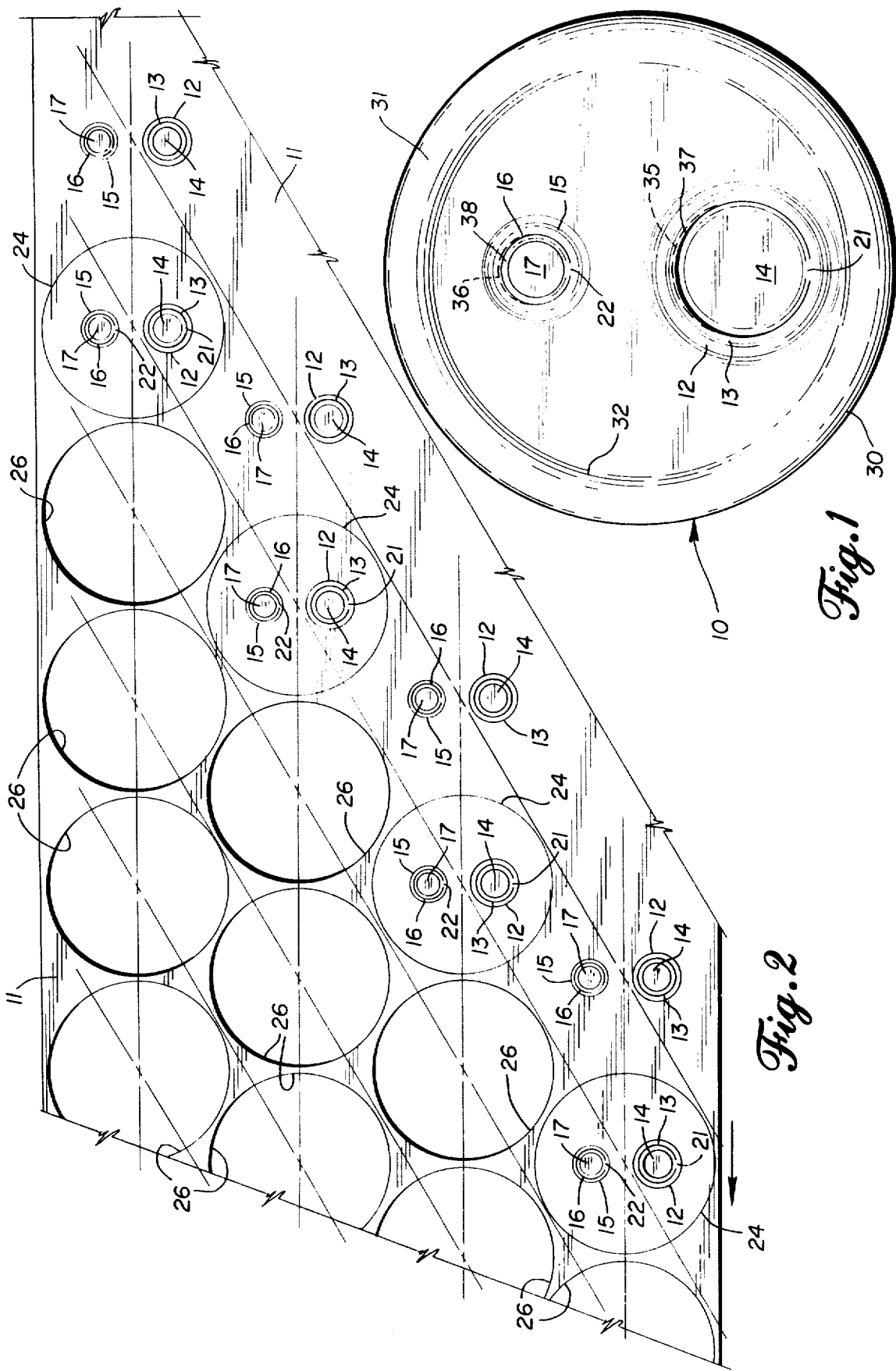


Fig. 1

Fig. 2

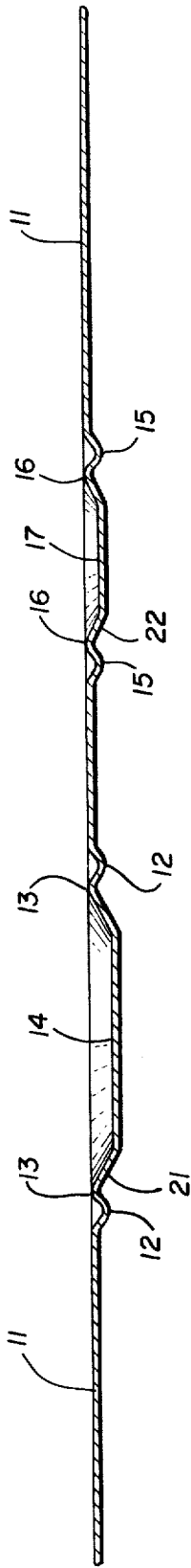


Fig. 3

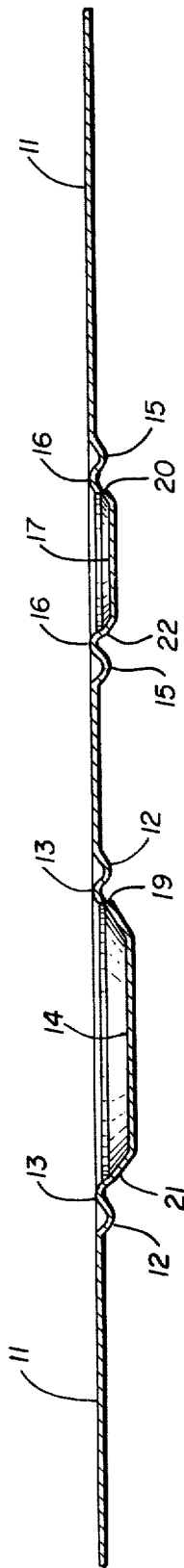


Fig. 4

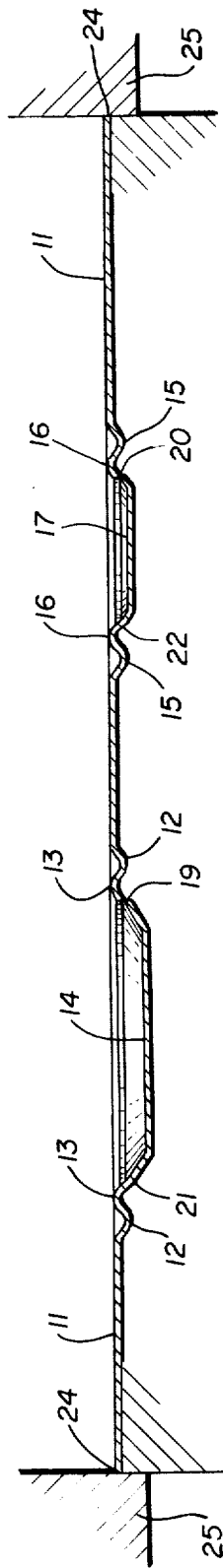


Fig. 5

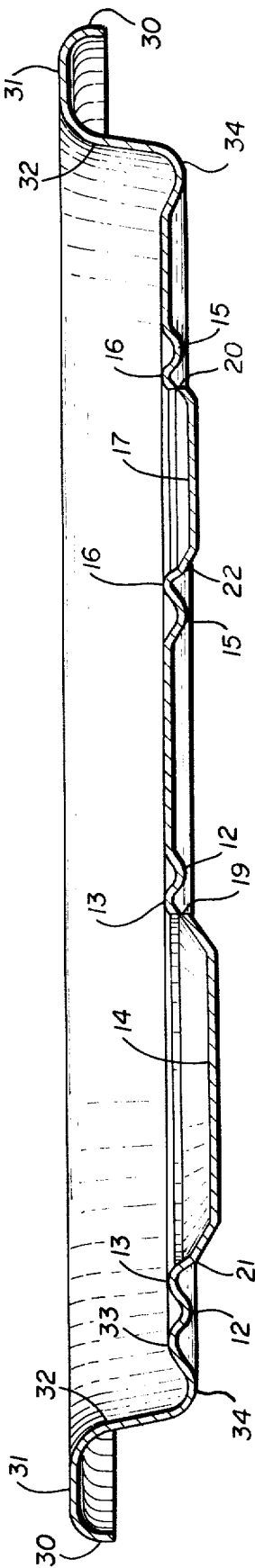


Fig. 6

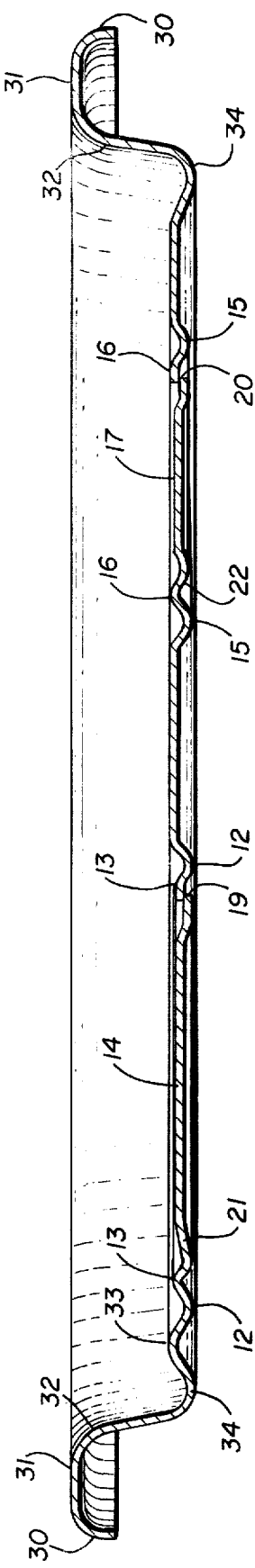


Fig. 7

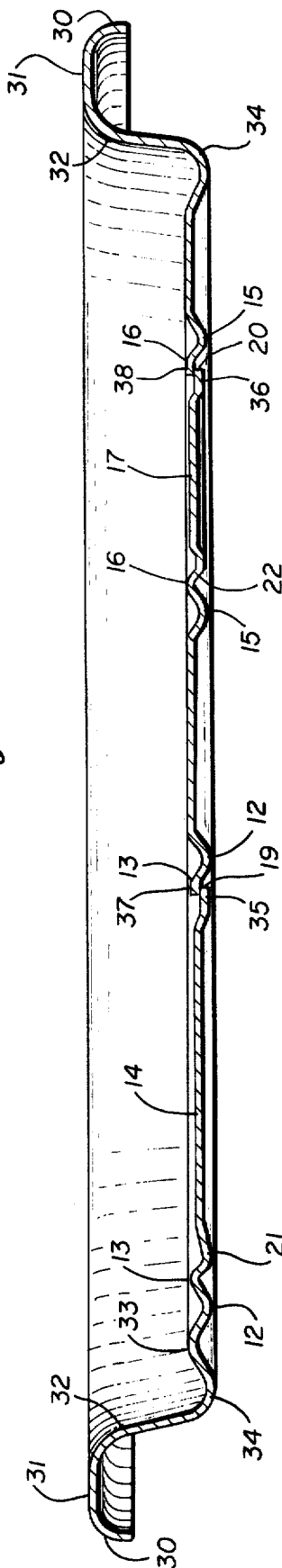


Fig. 8

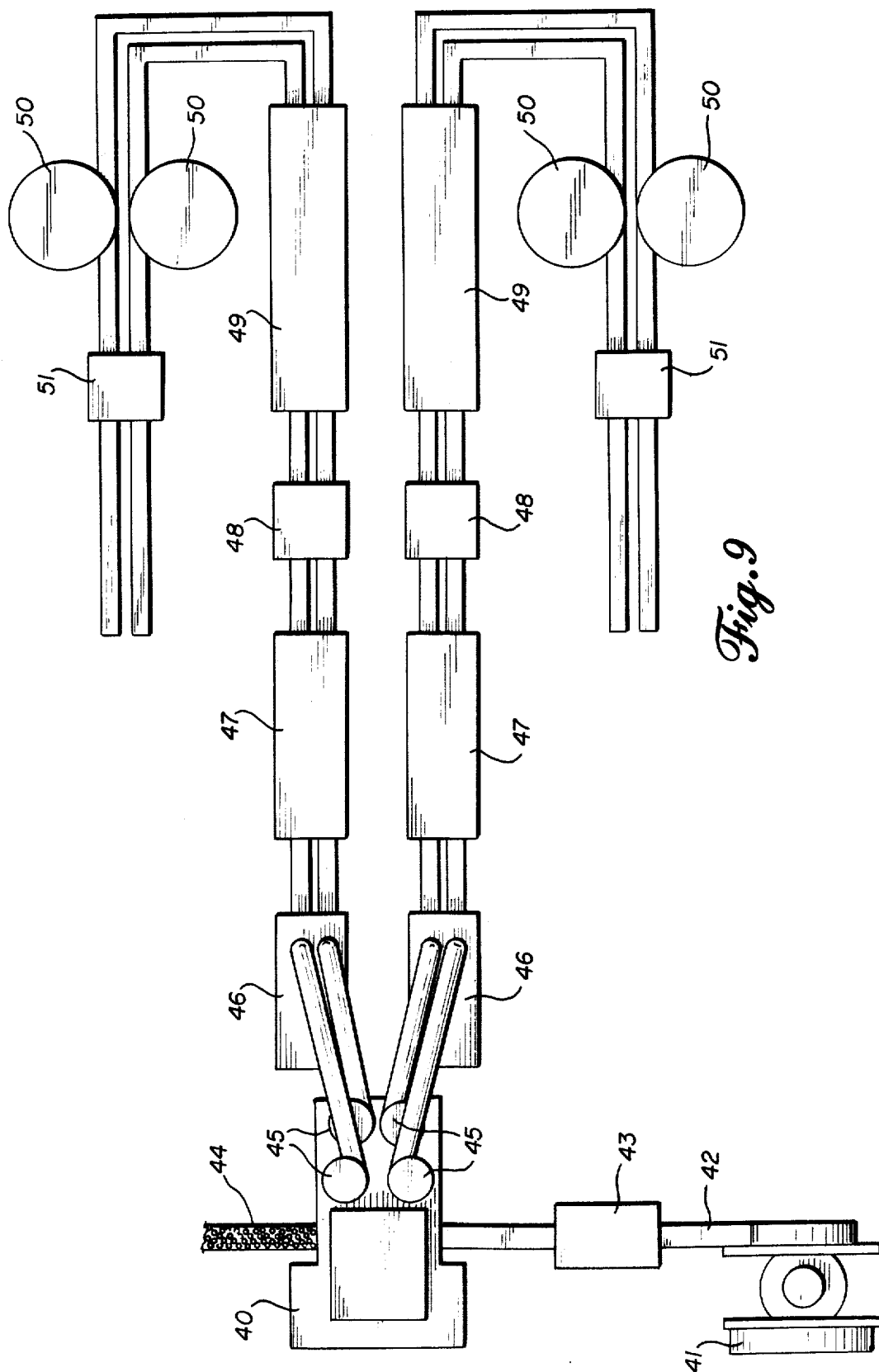


Fig. 9

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

This invention relates to a method of making a press tab container end from a metallic web, 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.

The method includes a plurality of operations, namely, forming a batch of sets of the two closure tabs in predetermined areas of a metallic sheet, called a web, lancing the sheet to separate the tabs from the rest of the area except in the hinge portions, blanking to define the predetermined areas of the container ends by cutting each blanked area including the formed tabs, from the rest of the web, drawing to shape the peripheral parts of each blanked container end for subsequent attachment to a container body, reforming the previously formed and drawn ends, and coining the ends to make the closure tabs underlie the edges of the metal surrounding the openings. 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. Sealant is applied to the inner surfaces of the overlapping portions of the tabs and container end 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 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 a speedy and efficient method of producing container ends of the character shown in the drawings, by which are performed the operations of forming, lancing, blanking, drawing, reforming and coining, singly or in batches, in a two stroke operation by a single press.

Another object is to perform each of the first two of the aforementioned operations, namely, the forming and lancing, simultaneously on a plurality of areas in an aluminum web lay-out, and to perform each of the following four operations, namely, the blanking, drawing, reforming and coining, simultaneously on said previously formed and lanced areas which constitute a batch in this method. As shown herein, a batch of four areas each comprising a pour opening closure press tab and a pressure release vent closure press tab, is subjected to the forming and lancing, followed by blanking to separate the formed and lanced areas from the skeleton of the sheet, succeeded by drawing, reforming and coining performed on the batch of separated ends. The blanking, drawing, reforming and coining steps are performed in the second stroke of the press but it is possi-

ble to include the blanking as the third step in the first stroke operation.

Another object of the invention is to apply a sealant to the overlapping edges of the container end 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 container end has a cumulative temperature effect that eliminates the need for post-heating of the coated can end after application of the sealant in order to obtain efficient adhesion and an air and fluid tight seal.

Another object of the invention is to employ a sealant application by which the sealant is projected from the applicator onto the closure and adjacent can end 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 plan view of a can end made in accordance with the method of this invention.

FIG. 2 is a plan view of an elongated sheet of aluminum alloy called a web on which a forming step and a lancing step are performed on a batch of equi-spaced areas, followed by a blanking step which separates the formed and lanced areas from the rest of the web lay-out.

FIG. 3 is a transverse vertical sectional view of an area which is one of the plurality of areas shown in the right hand diagonal row in FIG. 2, showing the result of the forming step of the method by which the metal is formed to define the pour opening closure tab and the pressure release vent closure tab.

FIG. 4 is a view similar to FIG. 3, in which the closure tabs of FIG. 3 have been lanced to cut them from the adjacent metal except in the hinge area of each of the two closures of one end.

FIG. 5 is a view similar to FIG. 4, in which the previously formed and lanced areas of the batch have been blanked to separate them from the web of FIG. 2.

FIG. 6 is a view similar to FIG. 5, showing a blanked end that has been drawn to shape the peripheral edge of the blank preparatory to a subsequent curling and gasket insertion operation.

FIG. 7 is a view similar to FIG. 6, showing a previously drawn can end reformed to flatten the lanced closure tabs.

FIG. 8 is a view similar to FIG. 7, showing the effects of a coining step whereby the closure tabs and adjacent metal of the can ends have been caused to overlap in such manner that the closure tabs underlie the adjacent parts of the can end.

FIG. 9 is a layout of a web press line, showing diagrammatically the web press, with roll stand, web stock and web skeleton, a batch of curlers, compound machine, preheat oven, press tab sealant applicators, coolers, testers and end baggers.

The can end shown in FIG. 1, produced by the method of this invention, comprises a flat metallic plate 10, preferably aluminum, originally part of the web or sheet 11 (FIG. 2), formed and lanced as shown in FIGS. 3 and 4, respectively, and blanked as shown in FIG. 5. The forming step performs the operation of shaping the upwardly opening groove 12 and rib 13 surrounding the partially formed pour opening closure tab

area 14. Likewise, the forming step shapes the upwardly opening groove 15 and rib 16 surrounding the partially formed pressure release closure tab area 17, as shown in FIG. 3.

The lancing step illustrated in FIG. 4 performs cutting of the tab areas 14 and 17 as indicated at 19 and 20, respectively. The cutting separates the tab areas 14 and 17 from the surrounding adjacent parts of the web 11 except in small hinge areas 21 and 22, respectively.

The blanking step of the method is illustrated in FIG. 5, where the formed and lanced can end area is blanked to separate it from the rest of the web 11. As shown in FIG. 2, the initial forming to produce the grooves and ribs which define the tab areas is performed on the web 11 in a batch of four areas in a diagonal row toward the right of the figure. While in the same positions, the lancing of the tab areas 14 and 17 is done as described and shown in connection with FIG. 4. Then the web 11 travels to the left as indicated by the arrow in FIG. 2, moving the formed and lanced areas into the second right hand diagonal row of FIG. 2, where the blanking step is performed by cutting on the lines 24 to separate individual can ends from the web 11. FIG. 5 shows the blanking step where the circular edge 24 is cut by tools 25 from the web 11. Ejected blanked can ends leave openings 26 in the web or "skeleton."

The blanking step of separating the formed and lanced areas from the web 11 preferably is performed as one of the several subsequent steps performed in a second stroke of the press. The blanking step is followed by the drawing step of FIG. 6, the reforming step of FIG. 7 and the coining step of FIG. 8, preferably performed in the position of the batch of can ends shown within the circular outlines 24 in the second diagonal row of FIG. 2, by a second stroke of the press.

Referring to FIG. 6, the drawing step has been performed on the previously formed, lanced and blanked can ends of a batch, now separated from the web 11. The drawing step draws the peripheral area into a curved outer edge 30, top 31, downwardly and inwardly curved portion 32, rib 33 and bead 34. The configuration of the area 33 at the left of FIG. 6 differs slightly from that at the right of the figure due to the fact that the area of the tab 14 is closer to the peripheral edge than is the smaller area of the tab 17, but said areas between the tabs and the periphery are substantially alike.

The reforming step shown in FIG. 7 alters the tabs 14 and 17 relatively to the surrounding end surfaces, flattening the tabs 14 and 17 and the adjacent hinge areas 21, 22, respectively, whereby the tab areas are slightly spread.

The final step in said aforementioned series of steps performed in the second stroke of a press, is the coining step illustrated in FIG. 8, wherein the previously formed, lanced, blanked, drawn and reformed can ends are subjected to further spreading of the tabs 14, 17, for the purpose of providing the underlying tab edges 35, 36, beneath the edges 37, 38, thereby providing closure tabs which can be depressed manually but cannot move upwardly.

FIG. 9 shows diagrammatically a web press 40. A roll stand 41 supplies web stock 42 to an uncoiler 43 to the press 40. After the heretofore described operations of forming, lancing, blanking, drawing, reforming and coining have been performed in the press, the web skeleton 44 passes out of the press 40. The batch of ends

(in this embodiment, four ends are produced in a batch, as heretofore described) is ejected from the press and passed to curlers 45 where the drawn peripheral edges 30 are curled for reception of the gasket compound contained in the compound machines 46. Then the ends 10 are conveyed to preheat ovens 47 and press tab sealant applicators 48. After the sealant has been applied, the ends are conveyed to coolers 49, testers 50, and finally to end baggers 51.

As indicated by the description of FIG. 9, preferably the container ends are pre-heated before application of the sealant, to a temperature compatible with the melting temperature (160° - 250° F.) of the sealant, thus making it unnecessary to post heat the sealant-coated ends. Post heating of the coated can ends may be done, but this requires heating both the sealant and the can end, whereas the preferred procedure of this method minimizes the heat treatment by preheating 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.

The web method of this invention provides means for simultaneously forming tabs in a plurality of areas and for simultaneously lancing the tabs of the batch of areas at high speeds while the formed and lanced areas are parts of the web, followed by batch blanking, drawing, reforming and coining of the ends. The described "web" method results in minimal handling as well as high speed in production.

I claim:

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

- a. forming in a metallic web 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,
- b. lancing the metal slightly inwardly of the top of said ribs to cut the tab areas from the web excepting where the tabs are joined hingedly to the web,
- c. blanking out of the web a circular end including the two formed and lanced tabs,
- d. drawing the peripheral portion of the blanked out end and forming a downwardly opening curved circumferential edge portion,
- e. reforming the blanked out end to flatten and spread the tab areas,
- f. coining the reformed end to make the tab edges underlie surrounding end areas,
- g. subjecting the end to curling of the circumferential portion and insertion of gasket compound in the curled edge,
- h. heating the end to temperature compatible with a sealant, and
- i. applying the sealant to the heated end to cover the seam between the overlapping tabs and surrounding end surfaces to provide an air and fluid tight seal.

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

5

3. The method defined by claim 1, in which the forming and lancing steps are performed on a plurality of end areas in an aluminum web, movable in a press, said end areas each including said two closure tabs and being located in a diagonal row in the web, and the blanking step separates the blanked ends from said web.

4. The method defined by claim 1, in which the forming and lancing steps are performed in one stroke of a press, and the blanking, drawing, reforming and coining steps are performed in the second stroke of the same press.

5. The method defined by claim 1, in which the forming and lancing steps are performed in one stroke of a press, the blanking and drawing are performed in the second stroke of the same press, and the reforming and coining steps are performed in a second press.

6. The method of making press tab container ends from a metallic web, each of said ends having a hinged pour opening closure tab and a hinged pressure release vent closure tab smaller in area than the pour opening closure tab, which comprises the steps of

- a. providing an elongated continuous metallic web having straight longitudinal side edges,
- b. forming and lancing said two closure tabs in each of a batch of said ends which are undefined areas of said web, said batch extending across the web from one side edge to the other side edge,
- c. blanking out can ends from said undefined areas of said web each including said two tabs and separating them from the web,
- d. subjecting each blanked out end to drawing of the peripheral portion,
- e. reforming the blanked out end to flatten and spread the tabs,

6

f. making the tabs and surrounding edges overlap by coining,

g. subjecting the peripheral area of the end to a curling and gasket-insertion operation, and

h. applying a sealant to the lower surface of the end to cover the seam between the overlapping tabs and end area to provide an air and fluid tight seal.

7. The method defined by claim 6, which includes the step of post heating the sealant coated end for adhesion of the sealant.

8. The method defined by claim 6, in which the sealant is a cold sealant of washer configuration, and the application of the sealant is followed by post heating the end for adhesion.

9. The method defined by claim 6, in which said undefined areas of the web are located in a diagonal row between said straight longitudinal side edges of the web.

10. The method defined by claim 6, in which the forming and lancing steps are performed simultaneously in one stroke of a press, and the blanking, drawing, reforming and coining steps are performed in the second stroke of the same press.

11. The method defined by claim 6, which includes the step of applying hot melt sealant to the seam between the tabs and container end which overlies the tab edges at the end of the coining step.

12. The method defined by claim 11, in which the container end is pre-heated to approximately 160° - 250° F. before application of the sealant.

13. The method defined by claim 11, which includes curling the circumferential edge of the drawn end and inserting gasket compound in the curled edge before applying the sealant.

* * * * *

40

45

50

55

60

65