

Sept. 20, 1971

E. H. HANKE ET AL
CONTAINER OPENING MEANS

3,606,076

Filed May 7, 1969

Fig. 1

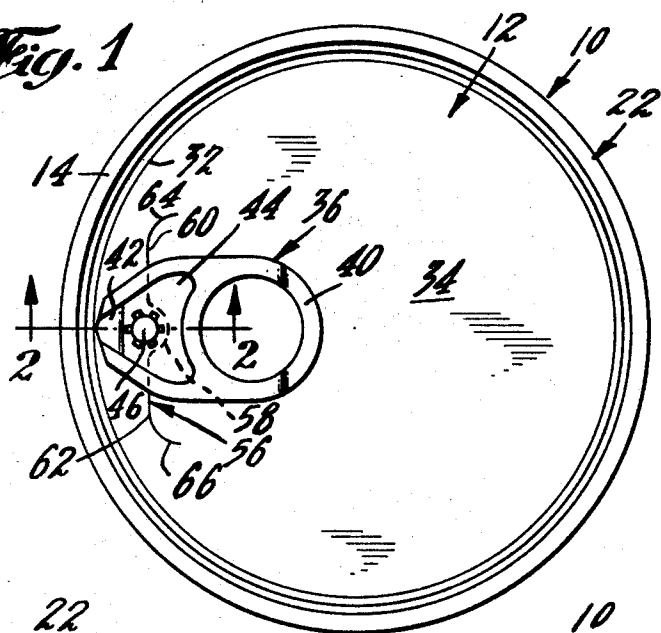


Fig. 4

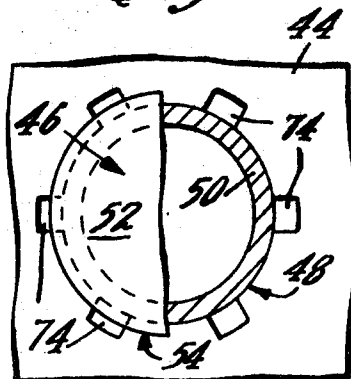


Fig. 2

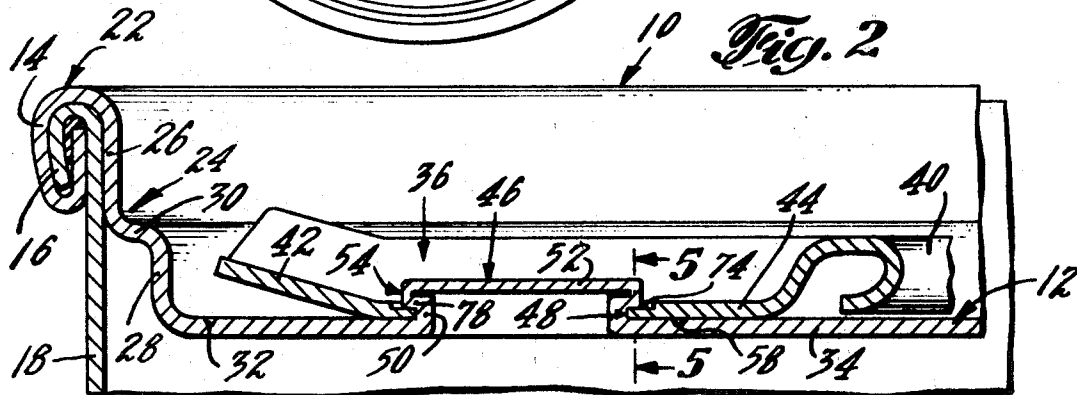


Fig. 3

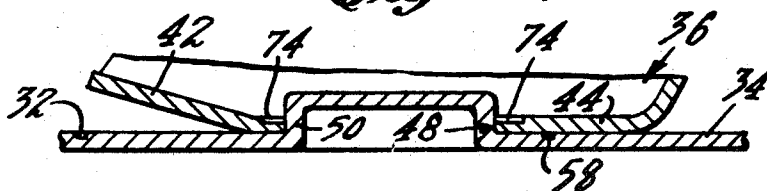
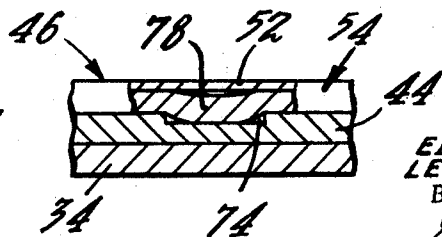


Fig. 5



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3,606,076

CONTAINER OPENING MEANS

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Filed May 7, 1969, Ser. No. 822,509

Int. Cl. B65d 17/24

U.S. Cl. 220—54

6 Claims

ABSTRACT OF THE DISCLOSURE

In order to prevent rotation of a pull tab about a rivet which secures it to the scored end closure of a container, a plurality of recesses are indented into the upper surface of marginal edge portion of the tab which defines the opening in the tab in which the rivet is received. Upon formation of the rivet head to secure the pull tab to the end closure, the metal of the rivet head is caused to flow into the recesses in the tab to lock the latter against rotation on the rivet.

BACKGROUND OF THE INVENTION

In scored easy-open can ends, the pull tab which ruptures the score is frequently secured to the can end by a rivet is formed integral with the end. The rivet is commonly circular and it has been known that during shipment or storage, the pull tab may be inadvertently rotated about the rivet from its preferred or desired position. When this occurs difficulty may be encountered in opening the end closure, since the nose of the tab may no longer be positioned in the area in which its pressure may be advantageously applied to rupture the score.

The present invention solves this problem by providing a practical mechanical interlock between the pull tab and the rivet which prevents relative rotation between them. This is done by coining recesses into a portion of the tab, and by pressing portions of the rivet into these recesses to provide the interlock. This solution is economically attained since it requires no additional material and is extremely simple to effect since the coining and pressing operations, which are the only new steps required, may usually be incorporated in existing manufacturing operations. Accordingly, an object of the present invention is to provide a practical means for preventing rotation of a lift tab about the rivet which secures the tab to an end closure.

SUMMARY OF THE INVENTION

An easy-open container end closure is provided with an opening tab secured to a removable panel by a rivet integral with the end closure. The removable panel is bounded by a score which is ruptured by pressure applied by the nose of the tab when its handle is lifted. In order to prevent rotation of the pull tab about the rivet to a non-opening position, a plurality of recesses are indented into the tab around the tab opening in which the rivet is received. When the head is formed on the rivet to secure the tab in place, the material of the rivet head flows into the recesses to thereby lock the tab against rotation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a finished end closure made in accordance with the present invention;

FIG. 2 is an enlarged section taken along the line 2—2 in FIG. 1 and showing the finished end closure after it has been seamed onto a can body;

FIG. 3 is a fragmentary section showing the pull tab disposed on the end closure preparatory to the rivet heading operation;

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FIG. 4 is a fragmentary plan view of the rivet and the adjacent portion of the pull tab as shown in FIG. 2, parts being broken away; and

FIG. 5 is a fragmentary sectional view, on an enlarged scale, taken substantially along the line 5—5 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 illustrates a container end closure, indicated generally by the numeral 10, made in accordance with the instant invention. Preferably, it is circular and made of aluminum, tinplate, or other rupturable metal or non-metallic material. The end closure 10 is formed with a substantially flat imperforate central wall 12 and has an edge curled peripheral flange 14 which is adapted to be interfolded with an end flange 16 of a can body 18 to form a double seam 22. The bottom end of the can body 18 is closed in any suitable manner as by seaming a conventional end closure (not shown) thereto, or if desired, by an end wall (not shown) formed as an integral part of the body 18.

The central wall 12 and the peripheral flange 14 are preferably joined by a countersink wall 24 which has an upper portion 26 and an inwardly offset lower portion 28 which are joined by a shoulder portion 30. The general construction and advantages of an easy open end utilizing the countersink wall 24 are covered by United States Letters Patent 3,409,166 granted on Nov. 5, 1968 to Leonard Thomas La Croce and Raymond Luscombe Batchelar, and do not form a part of the present invention.

At or adjacent to the periphery of the central wall 12 is a score 32 which is indented into the metal and defines a removable panel 34 which includes most of the wall 12. Positioned close to the score 32 is a stiff, non-bendable pull tab 36 formed at its inner end with a handle portion 40 to enable the pull tab 36 to be easily manipulated by the user. The tab has at its outer end an uplifted nose portion 42, and a flat web portion 44 which extends between the nose portion 42 and the handle portion 40.

The pull tab 36 is joined to the removable panel 34 by a rivet 46 which is formed integral with the removable panel 34 and extends through a circular rivet hole or opening 48 formed in the flat web portion 44 of the pull tab 36. The rivet 46 (see FIG. 2) has a cylindrical shank 50 which merges at its top into a transverse top wall 52 having about its periphery an annular bead 54 which extends over the web portion 44 of the opening tab 36 around the opening 48 to clamp the opening tab 36 to the removable panel 34 as will be further explained.

The outer edge portion of the removable panel 34 may be provided with a generally chordally-extending ancillary score 56 having a curved central portion 58 which passes immediately behind the rivet 46. The score 56 also includes straight segments 60 and 62 which extend outwardly from the curved portion 58 and diametrically of the rivet 46 and merge into inwardly curled terminal portions 64 and 66, respectively.

When the handle 40 is lifted, initial rupture of the ancillary score 56 occurs in its curved portion 58 during the first stage of the upward rocking movement of the tab 36. The upturned nose portion 42 of the tab 36 allows this initial rupture of the ancillary score 56 to occur prior to the application of rupturing force to the peripheral score 32. Continued upward rocking movement of the tab 36 causes the tear in the ancillary score 56 to progress outwardly in opposite directions along the straight segments 60 and 62, thus freeing the rivet 46 for movement out of the plane of the panel 34. However, the curved score segments 64, 66 effectively inhibit tearing beyond the ends of the segments 60, 62.

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Further upward movement of the tab handle 36 forces the tab nose 42 downwardly against the panel 34 just inwardly of the score 32 and thus initiates rupture of the peripheral score 32. Thereafter, an upward and backward pull on the tab 36 causes the tear in the peripheral score 32 to extend in both directions around the score for 360 degrees to completely detach the removable section 34 from the can end 10, thus completing the opening of the can.

In order to prevent the pull tab 36 from rotating about the rivet 46 to a position where it cannot function effectively, a plurality (here shown as six) of recesses 74 are provided in the upper surface of the flat web portion 44 of the pull tab around the opening 48. These recesses 74 start at the edge of the opening 48 and extend radially outwardly therefrom. In the illustrated embodiment, the recesses 74 extend a distance slightly beyond the outer diameter of the annular bead 54 of the rivet 46. The recesses 74 may readily be formed by a coining operation wherein a coining punch having a plurality of radially disposed projections corresponding to the size, shape, and spacing of the recesses desired indent the recesses 74 into the metal without removing metal, and as an incident to the operation wherein the opening 48 is formed.

The recesses 74 open up onto the opening 48 in the tab 36 so that when the tab 36 is placed in position on the shank 50 (FIG. 3) of the unheaded rivet, said recesses 74 extend up to the vertical cylindrical side wall of the shank 50. Accordingly, when the unheaded rivet has its top portions reshaped to form the finished rivet 46 shown in FIG. 2, the annular bead 54 which extends over the web portion 44 of the opening tab 36 overlies the recesses 74. During the heading operation, the material defining the annular bead 54 flows into the recesses 74 to form protuberances 78 which interengage with the side walls of the recesses to provide positive locking or anti-turning means (see FIG. 5). This arrangement permits the formation of a good, imperforate, leakproof rivet 46 while permitting enough of the metal of the rivet head to flow into the recesses to lock the tab 36 against rotation. This rivet heading operation may be effected in the manner described in United States Letters Patent 3,191,564 without any substantial change in equipment.

While it will be obvious that only one recess 74 and protuberance 78 will suffice to provide a locking means, it is desirable to provide a multiplicity of recesses and protuberances and to space them equally around the edge of the opening 48 in order to enhance the locking action and to evenly distribute the forces around the tab. As shown in the drawings, six recesses 74 have been provided, and it has been found in practice that such number functions suitably and adequately to prevent rotation of the tab.

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 its material advantages,

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the form hereinbefore described being merely a preferred embodiment thereof.

We claim:

1. A component for a container, comprising:

a substantially flat wall;
a removable panel in said wall bounded by a score;
a pull tab for initiating rupture of said score, said removable panel including a rivet having a rivet bead overlying a portion of said pull tab for securing said pull tab to said removable panel in position to effect said rupture; and

interengaging means on said pull tab and said panel and comprising at least one recess and at least one protuberance which projects into said recess cooperating to prevent said pull tab from turning on said rivet, said recess formed in the portion of said pull tab which underlies said rivet bead.

2. A component for a container, comprising:

a substantially flat wall;
a removable panel in said wall bounded by a score;
a pull tab for initiating rupture of said score;
a rivet securing said pull tab to said removable panel in position to effect said rupture; and

interengaging means on said pull tab and said rivet cooperating to prevent the tab from turning on said rivet, said means comprising a recess in said pull tab and a protuberance on said rivet which projects into said recess.

3. A component for a container, comprising:

a substantially flat wall;
a removable panel in said wall bounded by a score;
a pull tab for initiating rupture of said score;
a rivet securing said pull tab to said removable panel in position to effect said rupture, said rivet being disposed in an opening in said pull tab and being formed with a bead which overlies said tab around said opening; and

interengaging means on said pull tab and said rivet cooperating to prevent the tab from turning on said rivet, said interengaging means comprising a plurality of recesses in said tab and a plurality of protuberances on said rivet head which project into said recesses.

4. A component for a container according to claim 3 wherein said recesses are coined into said tab around said opening and said protuberances on said rivet bead are caused to flow into the recesses during the rivet heading operation.

5. A component for a container according to claim 4 wherein said rivet and said opening are circular.

6. A component for a container according to claim 4 wherein said recesses extend to the edge of said opening in said tab.

References Cited

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