United States Patent [19]

Kneusel et al.

[11] **3,910,453**

[45] **Oct. 7, 1975**

[54] **EASY OPENING CAN END WITH PUSH-IN TABS**

[75] Inventors: **Raymond H. P. Kneusel**, Flourtown, Pa.; **Vinson S. Potts**, Cherry Hill, N.J.

[73] Assignee: **Crown Cork & Seal Company, Inc.**, Philadelphia, Pa.

[22] Filed: **Oct. 10, 1974**

[21] Appl. No.: **513,723**

[52] **U.S. Cl.** **220/260;** 220/240; 220/334; 220/307; 220/352; 220/367

[51] **Int. Cl.²** **B65D 41/02**

[58] **Field of Search** ..... 220/260, 240, 281, 334, 220/307, 337, 352, 356, 367; 229/7 R

[56] **References Cited**

UNITED STATES PATENTS

3,197,059	7/1965	Anderson	220/367
3,749,274	7/1973	Mehe et al.	220/334
3,800,971	4/1974	La Vista	220/240

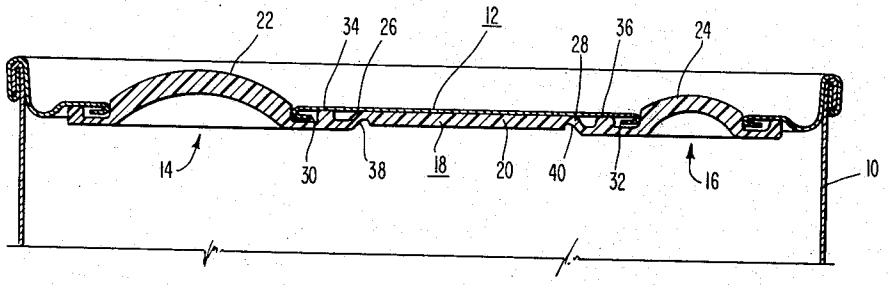
Primary Examiner—George T. Hall

Attorney, Agent, or Firm—Woodcock, Washburn, Kurtz & Mackiewicz

[57] **ABSTRACT**

A can end of the easy opening type with a preformed dispensing opening and a preformed venting opening is double seamed to a can body. A unitary push-in tab member is affixed to the underside of the end panel between the dispensing opening and the venting opening along a support portion. Push-in plug portions are connected to the support portion by hinge portions.

11 Claims, 4 Drawing Figures



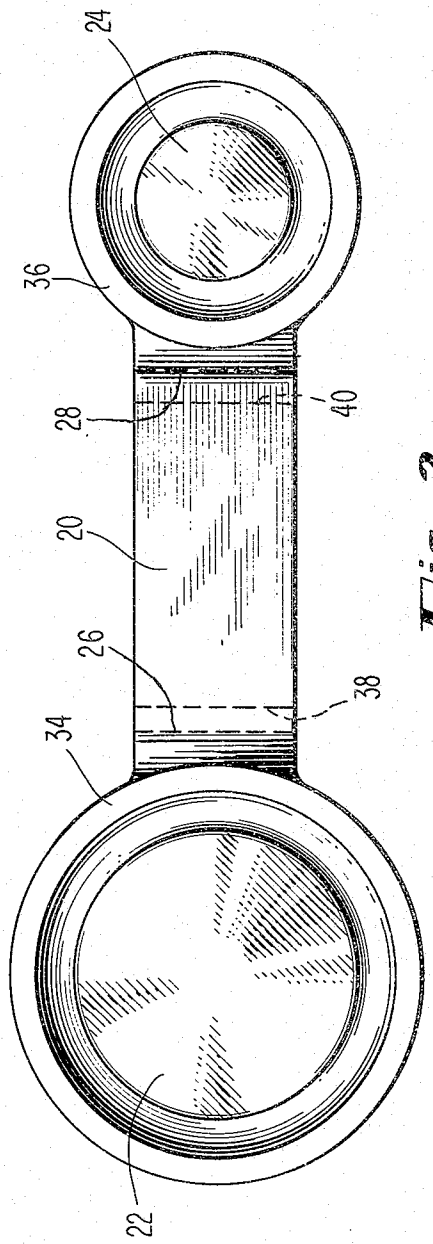

24
36
28
40
20
26
38
34
22

Fig. 2

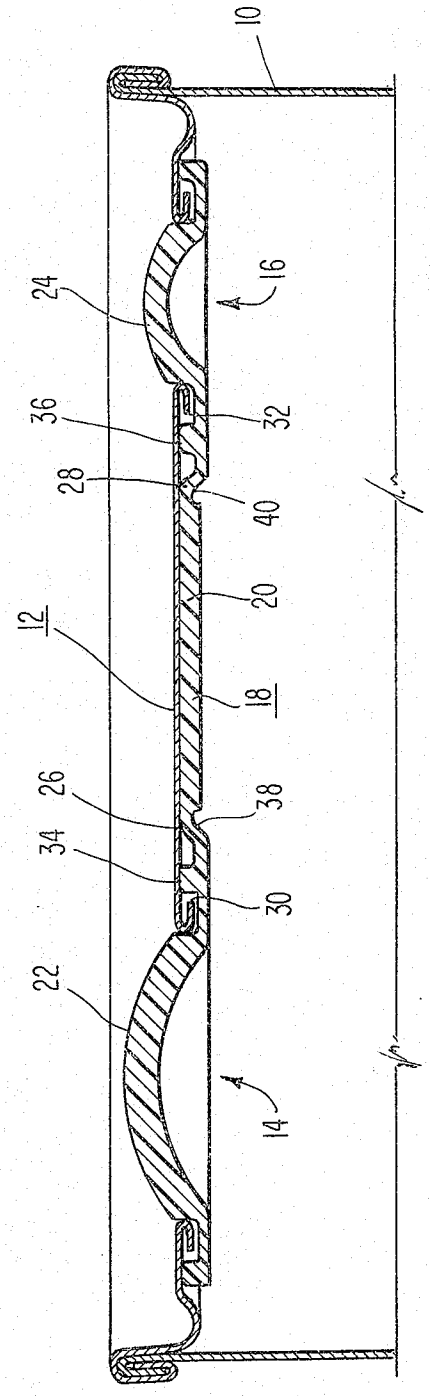

10
24
16
36
32
28
40
20
12
18
26
38
34
30
22
14

Fig. 1

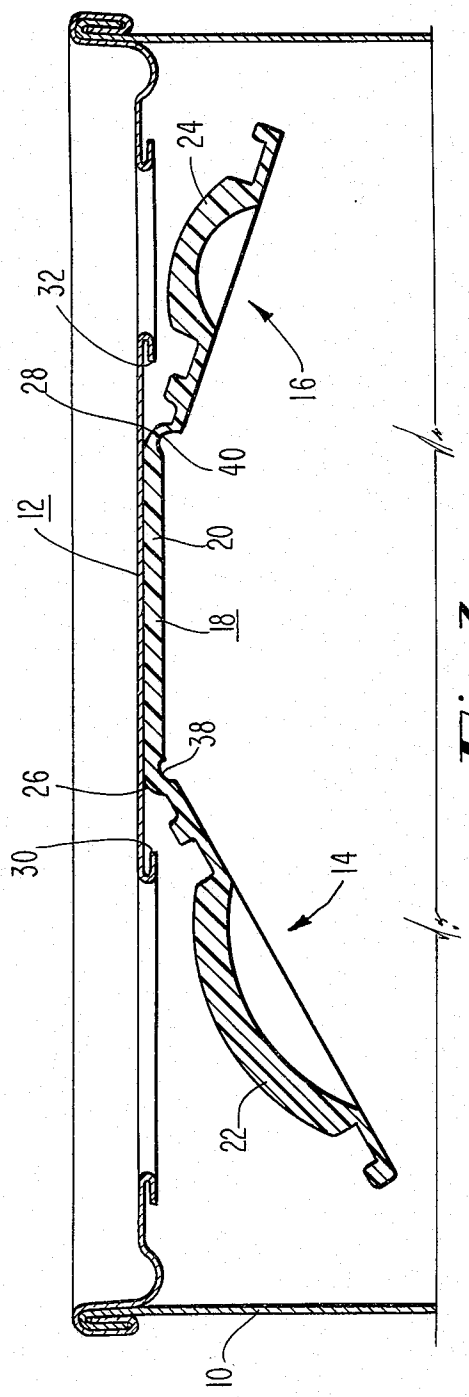

24
32
28
16
40
12
20
18
38
26
30
14
22
10

Fig. 3

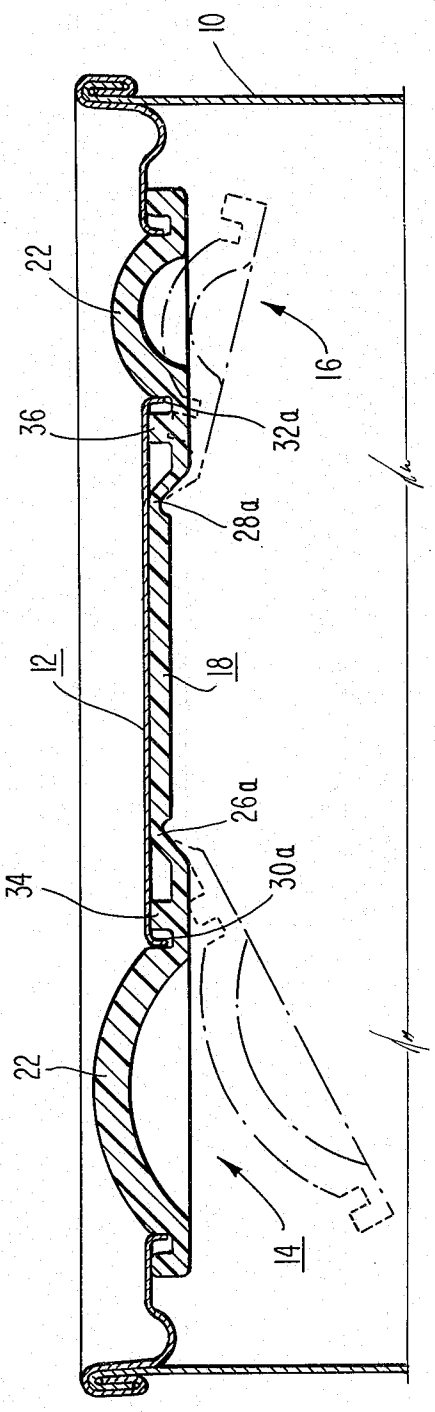

10
22
16
36
32a
28a
12
18
26a
34
30a
22
14

Fig. 4

EASY OPENING CAN END WITH PUSH-IN TABS

BACKGROUND OF THE INVENTION

This invention relates to easy opening containers or cans which may be opened by hand without benefit of an opening tool.

The most commercially successful easy opening cans utilize a tab which is formed by scoring a can end panel and removed by grasping a ring attached thereto and ripping of the tab from the end panel along the score lines. Aluminum is usually utilized for ring-tab ends of this type because of its soft and malleable qualities which allow the use of substantial residual scoring depths while still permitting removal of the tabs by hand.

However, aluminum can ends are objectionable from a number of standpoints. Aluminum is expensive and of relatively low strength as compared with a metal such as steel so that large quantities of aluminum must be utilized to provide can ends of sufficient gauge to withstand internal pressures generated within the cans. In addition, aluminum is expensive relative to steel, and aluminum can ends are also undesirable as compared with steel from an ecological standpoint since aluminum is not readily degradable. Furthermore, aluminum can ends are often utilized with steel can bodies and this combination is undesirable since an electrochemical reaction may be set up within the can due to its dual metallic nature, thereby creating the risk that the contents within a container may become contaminated.

The prior art has proposed a number of easy opening can ends which are suitable for use with ends which are not made from aluminum. For example, U.S. Pat. No. **3,744,662** — Zundel and U.S. Pat. **3,756,448** — Moller et al. both disclose plastic pull tabs which may be inserted into dispensing and venting openings of easy opening can end panels regardless of the material from which the panel is made.

On the other hand, a number of easy opening can end designs having push-in tabs have been proposed. U.S. Pat. No. **3,800,971** — LaVista discloses a sheet metal push-in plug which is free to fall into the contents of the can after opening. In general, the push-in plug design requires a downwardly extending bead around the opening so as to reduce the risk of cutting the finger during opening of the can. However, the downwardly extending curl does present problems in avoiding contamination of the contents in the can by the exposed edge of the curl at the opening. U.S. Pat. No. **3,334,775** — Klein et al. and U.S. Pat. No. **3,759,206** — Dalli et al. each disclose hinged push-in tabs which are integral portions of the can ends themselves. U.S. Pat. No. **2,842,295** — Bajada discloses push-in tabs which form a seal with the downwardly extending curl and thereby require the maintenance of very close tolerances of the plug as well as the curl.

SUMMARY OF THE INVENTION

It is an overall object of this invention to provide an improved easy opening can end which may comprise any metal.

It is a more specific object of this invention to provide an improved easy opening can end having a push-in tab member.

In accordance with these and other objects of the invention, the preferred embodiment of the can end of this invention comprises an end panel having an opening therein including a downwardly extending curl having an edge surrounding the opening. A plastic push tab member comprises a plug portion which closes the opening. In addition, the push tab member comprises a support portion affixed to the underside of the end panel adjacent the opening and a hinge portion attached to the support portion and freely movable downwardly away from the underside of the end panel. This tab member also includes a sealing portion attached to the end portion and spaced from the support portion. The sealing portion substantially surrounds the opening and is in substantial sealing engagement with the end panel at the underside thereof so as to substantially isolate the edge form the contents of the can closed by the can end. In order to eliminate the necessity for maintaining very close tolerances, the sealing portion does not form a seal with the curl itself but is spaced radially outwardly therefrom.

In the preferred embodiment of the invention, the sealing portion may also be affixed to the underside of the end panel. Affixing of the sealing portion and the support portion may be achieved by ultrasonic welding. In order to maintain the plug portion in the open position after once being pushed in, the hinge portion is provided with a memory capacity. This is accomplished by making the hinge portion thinner than the support portion. In addition, the hinge portion has a configuration wherein it extends downwardly and toward the opening so as to be spaced from the end panel.

In accordance with one important aspect of the invention, the end panel may include a dispensing opening and a venting opening and a single unitary push tab member having two plug portions closing each of the openings with the support portion of the unitary push tab member being located between the dispensing opening and the venting opening.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a sectional view of an easy opening can representing one preferred embodiment of the invention;

FIG. **2** is a plan view of the push-in tab member of FIG. **1**;

FIG. **3** is a sectional view of the can of FIG. **1** in the open position; and

FIG. **4** is a sectional view of a can representing another embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

An easy opening can shown in FIG. **1** comprises a can body **10** and an end panel **12** double seamed to the top of the can body **10** in a conventional manner. The panel **12** includes a preformed dispensing opening **14** and a preferred venting opening **16** spaced from the dispensing opening **14.**

In accordance with this invention, a unitary plastic push-in tab member **18** is affixed to the underside of the end panel **12** at a support portion **20** located between the dispensing opening **14** and the venting opening **16.** The tab member **18** comprises a push-in dispensing plug portion **22** and a push-in venting opening plug portion **24** which are connected to the support portion **20** by hinge portions **26** and **28.**

In order to permit the plug portions **22** and **24** to be pushed in without cutting the finger, the panel **12** is curled downwardly and radially outwardly at the venting opening **14** and the venting opening **16** such that

the raw edges **30** and **32** are not exposed to fingers inserted through the openings. In order to assure that the raw edges **30** and **32** are not exposed to the contents within the can, the tab **18** further comprises a first sealing portion **34** and a second sealing portion **36** to sealingly engage the underside of the panel **12.** As shown in FIG. **2,** the sealing portions **34** and **36** surround the plug portions **22** and **24** respectively. Thus, the sealing portions **34** and **36** are in sealing engagement with the underside of the panel **12** and substantially isolate the raw edges **30** and **32** from the contents of the can. However, there is necessity for maintaining close tolerances between the plug portion and the curl since an adequate seal is made with the underside of the panel radially outwardly from the curl at the top of sealing portions **34** and **36.**

In the preferred embodiment of the invention, the support portion **18** is affixed to the underside of the end panel **12** by ultrasonic welding. In addition, the sealing portion **34** and the sealing portion **36** are ultrasonically welded to the underside of the panel **12.** It is therefore important that the ultrasonic weld at the sealing portions **34** and **36** be broken during opening without breaking the ultrasonic weld of the support portion **18.** This is accomplished by spacing the support portions **34** and **36** from the support portion **18** and providing the intermediately located hinges **26** and **28.**

It will therefore be seen in FIG. **3** that the plugs **22** and **24** may be pushed into the can while the support portion **18** continues to remain affixed to the underside of the panel **12.** Moreover, the plugs **22** and **24** remain in the pushed-in position even after opening by providing the hinges **26** and **28** with a memory capacity.

The memory capacity of the hinges **26** and **28** is provided by recesses **38** and **40** which reduce the thickness of the hinge portions **26** and **28** relative to the thickness of the support portion **18.** In addition, the hinges **26** and **28** extend downwardly away from the underside of the panel **12** and toward the sealing portions **34** and **36** respectively so as to be spaced from the underside of the panel **12** and freely movable downwardly.

In the embodiment of FIG. **4,** the curl at the dispensing opening **14** and the venting opening **16** have been slightly modified, in particular, the curl extends substantially vertical at the edges **30***a* and **32***a.* In addition, the configuration of hinges **26***a* and **28***a* have been slightly modified.

Preferably, the end panel **12** comprises steel coated with an epoxy-vinyl. However, it will be understood that any metal may be utilized including aluminum or an aluminum alloy.

A number of different plastic materials may be utilized for the integral tab **18** including but not limited to acrylics, nylon fluoro plastics, phenolin, polyethylene and polystyrene.

Although specifice embodiments of the invention have been shown and described, other embodiments and modifications fall within the true spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. A can end of the easy opening type comprising:

an end panel having an opening therein including a downwardly extending curl having an edge substantially surrounding said opening; and

a plastic push tab member comprising a support portion affixed to the underside of said end panel adjacent said opening, a hinge portion attached to said support portion and freely movable downwardly away from said underside of said end panel, a sealing portion attached to said hinge portion and spaced from said support portion, said sealing portion spaced radially outwardly from said curl and substantially surrounding said opening and in substantial sealing engagement on the underside of said end panel so as to substantially isolate said edge from the contents of a can closed by the can end and a plug portion extending upwardly into the opening centrally of said sealing portion and said curl.

2. The can of claim **1** wherein said sealing portion is also affixed to the underside of said end panel.

3. The can end of claim **2** wherein said sealing portion and said support portion are ultrasonically welded to the underside of said end panel.

4. The can end of claim **3** wherein said hinge portion is spaced from the underside of said end panel.

5. The can end of claim **4** wherein said hinge portion is thinner than said support portion so as to provide a hinge memory to maintain said plug portion in a pushed-in position after opening.

6. The can end of claim **5** wherein said hinge portion extends downwardly and radially inwardly.

7. The can end of claim **1** wherein said end panel includes a dispensing opening and a venting opening and a single said plastic push tab member closes each said opening, the support portion being affixed to said underside of said end panel between said dispensing opening and said venting opening.

8. A can end of the easy opening type comprising:

an end panel having a dispensing opening and a venting opening, each said opening having a downwardly extending curl with an edge substantially surrounding said opening; and

a unitary plastic push tab member comprising a support portion affixed to the underside of said end panel between said dispensing opening and said venting opening, said push tab member comprising a dispensing opening plug portion and a venting opening plug portion connected to said support portion by hinge portions freely movable away from the underside of end panel.

9. The can end of claim **8** including a first sealing portion substantially surrounding said dispensing opening plug portion and connected to one of said hinge portions and a second sealing portion substantially surrounding said venting opening plug portion and connected to the other of said hinge portions, each said sealing portion being in substantial sealing engagement with said end panel so as to isolate said edge surrounding each said opening.

10. The can end of claim **9** wherein each said sealing portion is affixed to the underside of said end panel.

11. The can end of claim **10** wherein each said sealing portion and said support portion are ultrasonically welded to the underside of said end panel.

* * * * *