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Wharton

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[54] **BUTTON DOWN END CLOSURE**

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[51] **Int. Cl.** **B65d 45/00,** B65d 43/16

[58] **Field of Search** ..... 220/24 R, 25, 29

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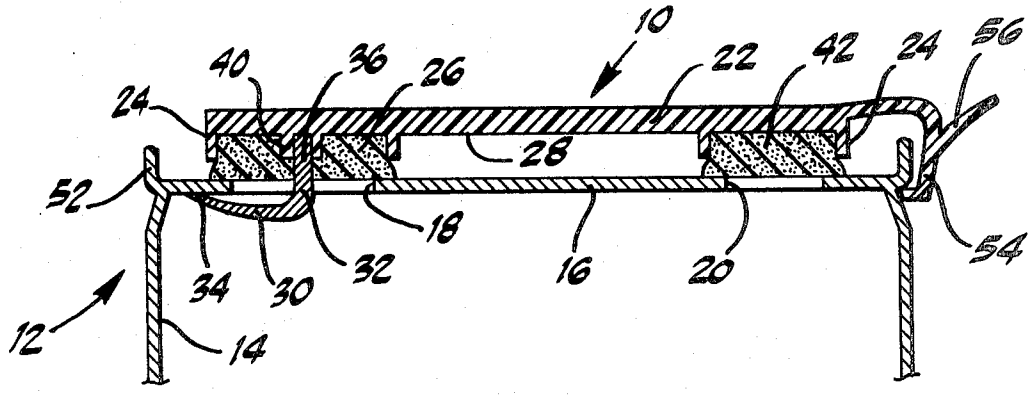
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[57] **ABSTRACT**

A device for sealing a plurality of openings, a first opening and at least one second opening, in the end wall of a container having at least one end wall and a side wall. The device includes a base member adapted to be positioned generally over the openings. A first pad of resilient material is attached to one surface of the base member and is of a size and is adapted to sealingly close one of the openings. A second pad of resilient material for each second opening is attached to one surface of the base member and is of a size and is adapted to sealingly close a second opening when the first pad is sealingly closing the first opening. A hook-shaped lever arm swings out from a first end positioned below the first pad of resilient material and then upwardly to a second end at a position spaced from the base member. Means are provided for attaching the first end of the lever arm to the base member through a passage in the first pad, so that the lever arm may be slid through the first opening and under the end wall of the container. The second end of the lever arm would then be positioned below and bearing against the end wall so as to compress the first pad into sealing position when the plane of the pad is parallel to the plane of the end wall. Means are provided for compressing the second pad into sealing position with respect to a second opening on the end wall of the container to complete the seal.

4 Claims, 6 Drawing Figures



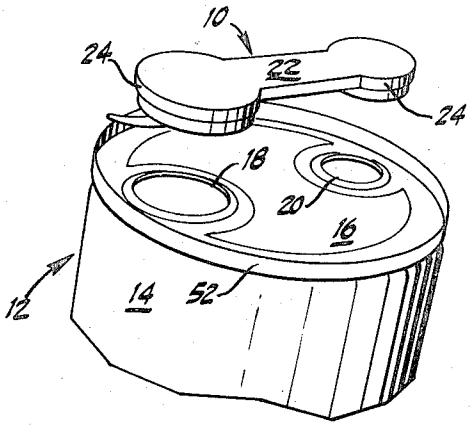


Fig. 1

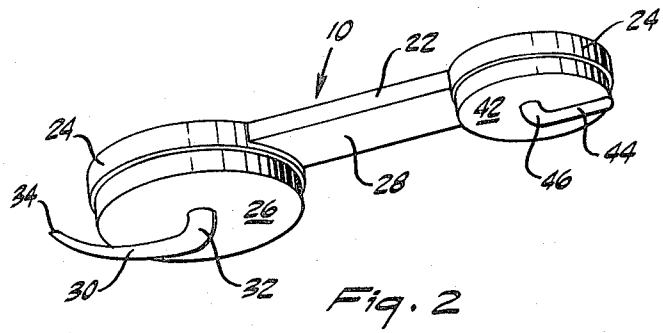


Fig. 2

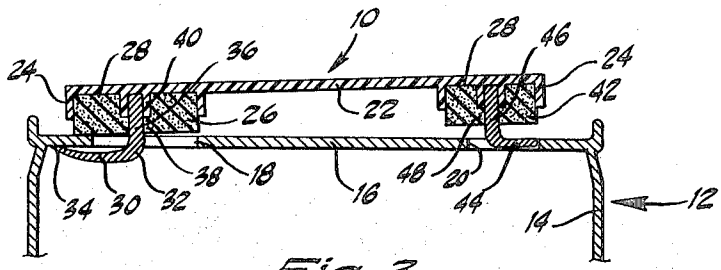


Fig. 3

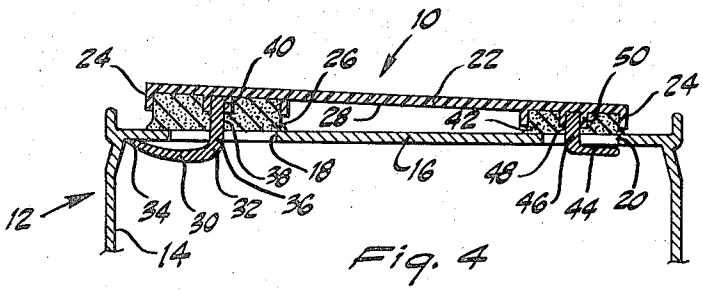


Fig. 4

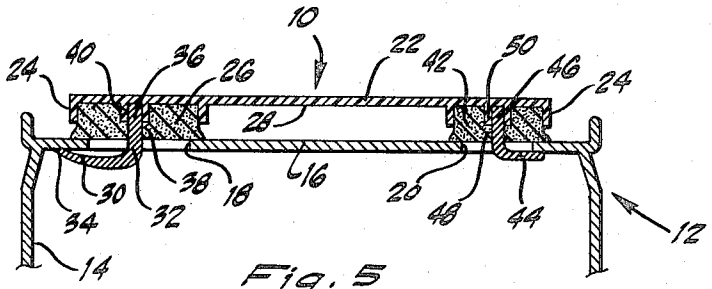


Fig. 5

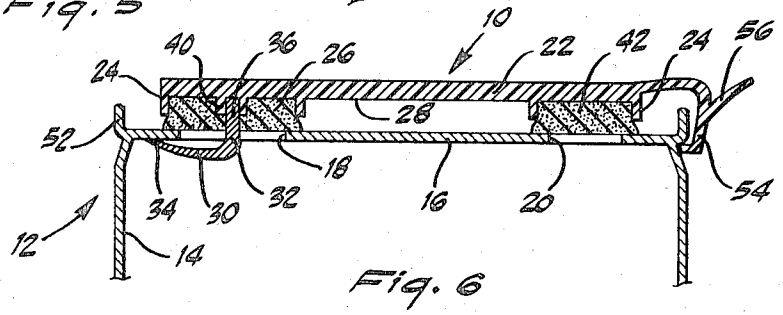


Fig. 6

BUTTON DOWN END CLOSURE

BACKGROUND OF THE INVENTION

The present invention relates to closures for containers. It is particularly applicable to sealing a plurality of openings in the end wall of a container having at least one end wall and a side wall. An example of such a container is the typical metal can such as a tin can or an aluminum can.

Containers such as metal cans are widely used today for the containment of solids and liquids such as beverages. The containers are designed to protect their contents from contamination by the atmosphere. Further, with particular reference to liquids, the liquids are frequently carbonated or in some other manner contain gases under pressure. If the container is left open to the atmosphere for any length of time, the gases in the liquid will escape and the liquid will become what is known as "flat." All of these problems are well known. Accordingly, there have been many attempts to provide various devices for sealing the openings made in such containers. The degree of the success of the closure has varied depending on the type of closure and the type of opening which it is adapted to close.

In the 1930's devices were developed for puncturing openings in the end wall of a container. Normally two openings were provided, one through which the liquid would pour and the other to admit air to the container to replace the liquid being removed and thus facilitate smooth pouring of the contents. Containers are still opened in this manner today. However, in the late 1950's and early 1960's, a so-called tab top end wall of a can was developed wherein a tab could be pulled to tear away part of the end wall making an opening. The opening made was of an elongate tear drop shape. The narrow part of the opening functioned as a vent and two openings were not always necessary. However, the earlier type of openings wherein two openings were utilized continued, although the tab top became very popular. Recently, there has been a reintroduction of the two opening concept in the end wall of a can. These are the so-called "botton down" end openings. The openings usually differ in size, the larger opening being utilized to dispense the contents of the container and the smaller opening functioning as a vent. This type of container is becoming increasingly popular and in some areas of the country is replacing the so-called tab top end wall container. Thus, it would appear there is a real need for a closure device to seal a plurality of openings in the end wall of a container which will be simple and yet effective.

It is an advantage of the instant invention that it provides a device for sealing a plurality of openings in the end wall of a container which will effectively perform this function and provide a substantially pressure tight seal. The device is simple to manufacture and use, and need contain no moving parts exposed to the contents of the container to present problems. As such, it will be highly durable and easy to clean for reuse. It is a further advantage of the present invention that the device, although very pressure tight, is easily applied to the container and easily removed therefrom.

The present invention provides a device or closure for sealing a plurality of openings, a first opening and at least one second opening, in the end wall of a container having at least one end wall and a side wall. The device includes a base member adapted to be positioned generally over the openings. A first pad of resilient material is attached to one surface of the base member and is of a size and is adapted to sealingly close one of the openings. A second pad of resilient material for each second opening is attached to one surface of the base member and is of a size and adapted to sealingly close a second opening when the first pad is sealingly closing the first opening. A hook-shaped lever arm swings out from a first end positioned below the first pad of resilient material and upwardly to a second end at a position spaced from the base member. Means are provided for attaching the first end of the lever arm to the base member through a passage in the first pad so that the lever arm may be slid through the first opening and under the end wall of the container. The second end of the lever arm would then be positioned below and bearing against the end wall so as to compress the first pad into sealing position when the plane of the pad is parallel to the plane of the end wall. Means are provided for compressing the second pad into sealing position with respect to a second opening on the end wall of the container to complete the seal.

Other objects and advantages of the present invention will be apparent from the following detailed description in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings are illustrative of advantageous embodiments of this invention.

In the drawings:

FIG. **1** is a perspective view of a closure device according to the present invention showing its relationship to the openings in a container which it is to seal;

FIG. **2** is a further perspective view of the closure of FIG. **1**;

FIG. **3** is a side elevational view, in section, and with parts removed for purposes of clarity, of the embodiment of FIG. **1**, showing it as it is being applied to a container to seal the openings therein;

FIG. **4** is a further side elevational view, in section, and with parts removed for purposes of clarity, of the embodiment of FIG. **1**, showing it in a further position as it is being applied to the container to seal the openings therein;

FIG. **5** is a side elevational view, in section, and with parts removed for purposes of clarity, of the embodiment of FIG. **1** in sealing position on a container;

FIG. **6** is a side elevational view, in section, and with parts removed for purposes of clarity, of another embodiment of the invention.

DETAILED DESCRIPTION

Throughout the drawings, corresponding reference numerals have been used for corresponding parts.

Referring now particularly to FIG. **1**, a closure device in accordance with the present invention is indicated generally at **10**. A container shown as the typical metal can is indicated generally at **12**. As shown, this container **12** includes a side wall **14** and an end wall **16** having a first opening **18** and a second opening **20** therein. On this particular container **12**, first opening **18** would normally be used for dispensing the contents of container **12** and second opening **20**, being smaller than opening **18**, would be used as a vent. This is for illustrative purposes only and it will be appreciated other arrangements of the openings and size relationships of

the openings may be found on a container and this will not affect the applicability of the present invention.

As shown, closure device **10** includes a base member **22,** shown as a dog biscuit or dumbbell shape, although other configurations are, of course, possible. Overhanging lip **24** may be provided depending from at least part or parts of base member **22.**

Referring now more particularly to FIG. **2,** a first pad **26** of resilient material such as rubber or neoprene may be seen attached to one surface (**28** in FIG. **3**) of base member **22.** It will be seen that first pad **26** is of a size and is adapted to sealingly close first opening **18** in container **12.**

Any suitable means of attaching pad **26** may be used although adhesive is perhaps the simplest. Lips **24** will facilitate retaining pad **26** in position on surface **28** of base member **22.**

A hook-shaped lever arm **30** swings out from a first end **32** positioned below first pad **26** and then upwardly to a second end **34** at a position spaced from base member **10.** Means **36,** shown as an extension of lever arm **30** in FIG. **3,** attach first end **32** of lever arm **30** to base member **22** through a passage **38** in first pad **26.** As can be seen, means **36** are fitted into a socket **40** extending from lower surface **28** of base member **22.** Means **36** may be affixed by any appropriate manner in socket **40,** as by adhesive, sonic welding, or the like.

A second pad **42** of suitable resilient material for each second opening **20** (one second opening in the can embodiment shown) is attached to surface **28** of base member **22** and is of a size and adapted (as will be seen) to sealingly close second opening **20** when first pad **26** is sealingly closing first opening **18** of container **12.** Again, any appropriate means of attaching pad **42** to surface **28** of base member **22** may be utilized.

A shaft **44** extends outwardly from a position below second pad **42.** Suitable means, shown as an extension **46** of shaft **44,** are provided for attaching shaft **44** to base member **22.** As shown, extension **46** passes through a passge **50** and second pad **42** and fits into a socket **50** provided on surface **28** of base member **22.** Extension **46** is affixed in socket **50** in any suitable manner such as by means of an adhesive or sonic welding.

Referring to FIG. **3,** closure device **10** is seen as it is being applied to the openings **18, 20** in end wall **16** of container **12.** Lever arm **30** has been slid through first opening **18** and under end wall **16** of container **12.** Second pad **42** has correspondingly been slid over second opening **20** to a position such that shaft **44** may drop through second opening **20.**

Referring now to FIG. **4,** a further step in the application of the device **10** to the openings, **18, 20,** may be seen. In this figure, closure device **10** has now been swung downwardly to a position such that second pad **42** is compressed. Second end **34** of lever arm **30** is positioned below and bearing against end wall **16** with pressure. As a result, first pad **26** is also compressed slightly. Shaft **44** is now positioned within second opening **20** and below end wall **16.** As closure **10** is slid under pressure, for example, finger pressure, toward the side wall nearest second pad **42** (to the right in FIG. **4**), shaft **44** will extend beneath end wall **16.**

Referring now to FIG. **5,** closure device **10** may be seen in sealing position. The pressure upon base member **22** has been released and both pads **26** and **42** are now positioned substantially parallel to the plane of end wall **16.** Second end **34** of lever arm **30** is positioned below and bearing against end wall **16,** compressing first pad **26** into sealing position around first opening **18.** Shaft **44** longitudinally bears against the undersurface of end wall **16** compressing second pad **42** into sealing position around second opening **20.** As as result, both openings are sealed.

Referring now to FIG. **6,** an alternate means for compressing second pad **42** into sealing position around second opening **20** may be seen. This embodiment of the invention is particularly applicable to the situation wherein a rim **52** is formed at the juncture of the end wall **16** and side wall **14** of container **12.** In this embodiment, a clip **54** is attached to base member **22** and extends to and is adapted to snap over and engage rim **52** as shown. If desired, a tab **56** may be provided on clip **54** to facilitate engaging it with and releasing it from rim **52** of container **12.**

The devices of the present invention are simple, yet effective closures for the openings in the end wall of the container. They need have relatively few or no moving parts, are quite durable, and are easy to clean and maintain. They are easily applied and removed. This is quite important, particularly the ease of cleanliness, since they are quite apt to be utilized on containers containing material intended for human consumption. The devices are very pressure tight. It will be appreciated that while there have been shown and described hereinabove possible embodiments of this invention, the invention is not limited thereto, and various changes, alterations, and modifications can be made thereto without departing from the spirit and scope thereof as defined in the claims.

What is claimed is:

1. A device for sealing a plurality of openings, a first opening and at least one second opening, in the end wall of a container having at least one end wall and a side wall which devices comprises:

a. a base member adapted to be positioned generally over the openings;

b. a first pad of resilient material attached to one surface of the base member and of a size and adapted to sealingly close a first one of the openings;

c. a second pad of resilient material for each second opening attached to one surface of the base member and of a size and adapted to sealingly close a second opening when the first pad is sealingly closing the first opening;

d. a hook-shaped lever arm swinging out from a first end positioned below the first pad of resilient material and then upwardly to a second end at a position spaced from the base member;

e. means attaching the first end of the lever arm to the base member through a passage in the first pad so that the lever arm may be slid through the first opening and under the end wall of the container, the second end of the lever arm being positioned below and bearing against the end wall so as to compress the first pad into sealing position when the plane of the pad is parallel to the plane of the end wall;

f. means for compressing the second pad into sealing position with respect to a second opening on the end wall of the container to complete the seal.

2. The device of claim **1** when a rim is formed at the juncture of the end wall and side wall of the container wherein the means for compressing the second pad into

sealing position compresses a clip attached to the base member adapted to engage the rim in a position which compresses the pad.

3. The device of claim **2** including a tab on the clip for engaging it with and releasing it from the rim of the container.

4. The device of claim **1** wherein the means for compressing the second pad into sealing position comprises a shaft extending outwardly from a position below the second pad and adapted to longitudinally bear against the undersurface of the end wall of the container when the device is in sealing position on the end wall of the container, and means attaching the shaft to the base member.

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