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3,266,452

SIFT-PROOF DREDGE CLOSURE AND METHOD OF PRODUCING SAME

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Fig. 1

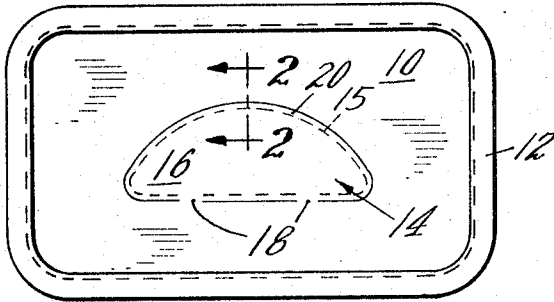


Fig. 2

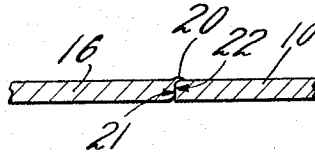


Fig. 3

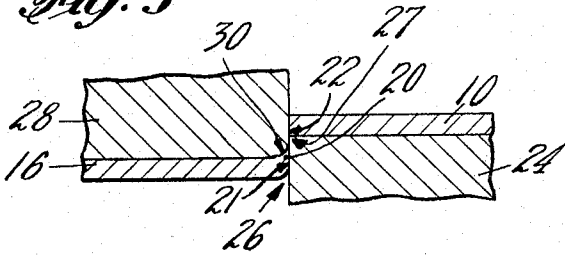


Fig. 4

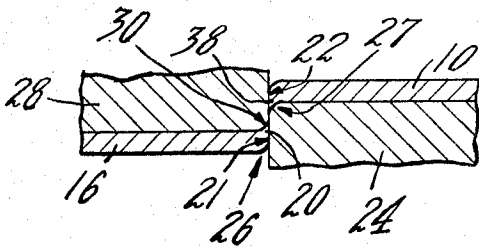
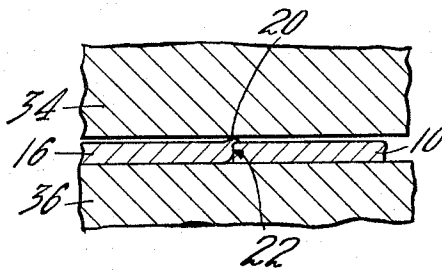


Fig. 6

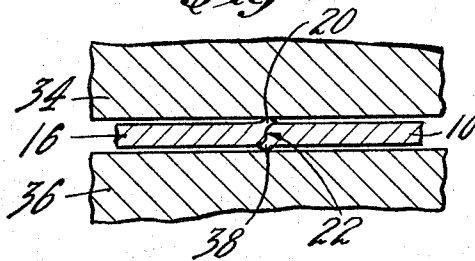


Fig. 5

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SIFT-PROOF DREDGE CLOSURE AND METHOD
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 9 Claims. (Cl. 113-121)

The present invention relates to the making of contain-
 ers and more particularly to a method for producing a
 sift-proof hinged closure for a dredge opening in a con-
 tainer.

In the manufacture of metal containers having a dredge
 opening and a hinged closure therefor, a critical problem
 has been to produce a sift-proof hinged closure for the
 opening which is created by a line of severance in a wall
 of the container and which can be easily pressed into the
 container by the consumer to initially open the container
 and to allow the dispensing of the product therein through
 the dredge opening. The previously used and present
 methods for making these dredge closures, while they have
 served the general purpose, have not proved entirely sat-
 isfactory. Some of these methods have failed to consis-
 tently provide an adequate sealing or sift-proof relation-
 ship between the hinged closure and the portion of
 the container defining the dredge opening, while other
 methods have required expensive coatings or adhesives to
 effect the desired sealing of the line of severance between
 the closure and the container.

The general purpose of this invention, therefore, is to
 provide a method for producing a sift-proof hinged clo-
 sure for a container dredge opening which embraces all
 the advantages of similarly employed methods and pos-
 sesses none of the aforescribed disadvantages. To ac-
 complish this, the present invention contemplates a unique
 method for producing a sift-proof hinged closure for a
 dredge opening in a container wherein a closure member
 is first severed from an end portion of the container to
 form a dredge opening therein, the closure member being
 severed in a manner to produce a generally upstanding
 burr on at least one of the cut edges created by the sever-
 ing operation. The closure member is then inserted into
 the dredge opening in the end portion of the container,
 and thereafter the burr is pressed or deformed over the
 adjacent surface to effectively cover and seal the line of
 severance.

An object of the present invention is the provision of a
 reliable and efficient method for producing a sift-proof
 closure for a dredge opening in a container.

Another object is to provide a container produced by
 the above method comprising a sift-proof closure for the
 dredge opening therein which is easily openable without
 the application of excess pressure.

A further object is the provision of such a container
 wherein a portion of the dredge closure member overlaps
 the adjacent surface of the container defining the dredge
 opening to provide a sealing relationship between the
 closure member and the defining surface.

A still further object is to provide such a container
 wherein a portion of the container surface defining the
 dredge opening overlaps the dredge closure member to
 provide additional sealing therebetween.

Yet another object is to provide a method for produc-
 ing a hinged, sift-proof closure for a dredge opening in a
 container in which a burr on the edge portion of a de-
 pressible closure member is deformed over the abutting
 portion of the container wall outlining the dredge open-
 ing to provide a sift-proof line of severance and a mechani-
 cal interlock between the closure and the panel which
 resists premature, inadvertent depression of the closure.

Still another object of this invention is the provision of

such a method wherein a sealing burr is also formed on
 the portion of the container defining the dredge opening,
 which burr is then deformed over the edge of the closure
 member into sealing engagement therewith to augment the
 sealing action of the closure burr.

Numerous other objects and advantages of the invention
 will be apparent as it is better understood from the fol-
 lowing description, which, taken in connection with the
 accompanying drawing, discloses a preferred embodiment
 thereof.

Referring to the drawing:

FIGURE 1 is a plan view of an end of a container
 constructed according to the principles of the present in-
 vention, showing a hinged closure for the dredge opening
 in the container end;

FIG. 2 is an enlarged sectional view taken substantially
 along line 2-2 in FIG. 1;

FIG. 3 is a sectional view through a portion of a cutting
 apparatus utilized to form a dredge opening and hinged
 closure member therefor in a container end, the view
 also showing the method steps of the invention wherein
 a depressed closure member is cut in the container end
 and a burr is formed on the cut edge portion of the clo-
 sure member as an incident to the cutting operation;

FIG. 4 is a sectional view through a portion of an ap-
 paratus utilized to press the closure member into sealing
 or sift-proof relationship with the container end portion
 defining the dredge opening, the view also showing the
 additional method steps of the invention wherein the clo-
 sure is reinserted in the opening and the burr on the clo-
 sure member is pressed or deformed into overlapping re-
 lationship against the container end portion;

FIG. 5 is a sectional view of a modified form of the
 apparatus and method steps shown in FIG. 3; and

FIG. 6 is a sectional view similar to FIG. 4, and show-
 ing the apparatus of that figure performing the method
 steps of the invention which are used in conjunction with
 the modified method steps of FIG. 5.

As a preferred or exemplary embodiment of the inven-
 tion, FIG. 1 illustrates a container end member 10 which
 is formed of metal or a similar material and provided with
 the usual peripheral flange 12 which is adapted to be se-
 cured to a container body (not shown) in the usual end
 seam. The end 10 has formed in it a dredge opening 14
 which is defined by a line of severance 15. The opening
 14 is closed by a closure member 16 which is disposed in
 the dredge opening 14 and is made integral with the end
 10, the line of severance 15 being interrupted in two places
 to provide a pair of hinges 18 for the closure member.
 As shown in FIG. 2, the closure member 16 is provided
 with a burr 20 on the cut edge 21 thereof which overlaps
 the abutting cut edge 22 of the container end 10. The
 burr 20 is pressed against the container end 10 to seal
 the dredge opening 14 and prevent the product within the
 container from sifting between the edge 21 of the closure
 member 16 and the abutting edge 22 of the end 10.

In producing the sift-proof closure member 16 for the
 dredge opening 14 by utilizing the steps of the instant
 method invention, the container end 10 is first placed on
 a support member, such as the die 24 partially shown in
 FIG. 3, having a central aperture 26 and a cutting edge
 27, both of which have a shape corresponding to that of
 the dredge opening 14. A cutting member such as a
 punch 28 having a cutting edge 30 is then moved into
 the aperture 26 to sever the closure member 16 from the
 end 10 and press it downwardly out of the plane of the
 end 10, thereby forming the dredge opening 14, as illus-
 trated in FIG. 3. The general cross-sectional shape and
 size of the punch 28 are substantially the same as that
 of the aperture 26 in die 24 so as to provide a close fit
 between the punch and the die.

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The closure member 16 preferably is not intended to be completely severed from the end 10, but instead to be hingedly attached thereto. In order to provide for this, it is necessary that the hinge portions 18 (FIG. 1) remain unsevered after the punch 28 has entered the aperture 26. This may be accomplished by providing cut-out portions (not shown) in either the cutting edge 30 of the punch 28 or the cutting edge 27 of the die 24, or both.

The cutting edge 30 of the punch 28 is rounded or curved, as shown in FIG. 3, to create a space between the punch and the die member 24 into which metal of the end 10 may flow. Thus, when the severing step takes place, the generally upstanding or outwardly extending burr 20, preferably about .006" to .008" in height, is produced on the cut edge 21 of the closure member 16. There is no burr formed on the cut edge 22 of the end 10, since the cutting edge 27 of the die 24 is provided with a sharp rather than a rounded corner, as seen in FIG. 3.

After the severing step of FIG. 3, the depressed closure member 16 is pressed back into the dredge opening 14, and the burr 20 is deformed or pressed over the upper or outer surface of the end 10 into sealing engagement therewith by pressure members 34 and 36, as shown in FIG. 4. It is noted that the pressing of the closure member 16 back into the dredge opening and the flattening of the burr 20 against the outer surface of the end 10 can be accomplished substantially simultaneously by the same apparatus or, alternatively, a separate apparatus can be used for each operation. Also, any other suitable type of apparatus could be used instead of the pressure members 34, 36 for these operations. Since the burr 20 is pressed into sealing relationship with the outer surface of the end 10, it bridges the line of severance 15 and this results in a sift-proof, hinged closure member 16 for the dredge opening 14 which may be easily opened by downward pressure. However, since the flattened burr 20 actually spans the line of cut 15, it creates a mechanical connection between the closure member 16 and the surrounding portion of the end 10 which provides sufficient resistance to downward movement to prevent inadvertent premature opening of the closure.

FIG. 5 shows a modified form of the invention wherein the punch 28 and die 24 are similar to those disclosed in FIG. 3. In this modified form, however, the cutting edges 30, 27 of both the punch 28 and the die 24, respectively, are rounded or curved to simultaneously produce the upstanding or outwardly extending burr 20 on the cut edge closure member 16 and a downwardly or inwardly extending burr 38 on the cut edge 22 of the end 10. As shown in FIG. 6, the burrs 20 and 38 are then pressed into sealing engagement with the outer surface of the end 10 and the inner surface of the closure member 16, respectively, to produce a sift-proof hinged closure for the dredge opening 14. By utilizing the modified apparatus of FIG. 5, therefore, burrs are produced on both the closure member 16 and the end 10 to provide a double sealing feature for the line of severance 15 between the dredge opening 14 and the closure member 16.

It will be readily seen that the principles of the invention are not limited to the constructions and methods disclosed in the drawing and specification, and various other modifications may be made without departing from those principles. For example, the closure member 16 may be hinged to the container end 10 in any suitable manner other than that shown at 18 in FIG. 1. Also, the dredge opening 14 may be of any desired size or shape, it may be provided on any portion of the end 10 or on any other portion of the container, and, if desired, a plurality of dredge openings could be provided on a single container. Furthermore, the degree of curvature of the cutting edges of the die punch and die member could be varied to change the size and shape of the burrs produced on the

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closure member 16 and the container end 10, or the burrs could be produced by utilizing a greater than normal clearance between the punch and die, rather than by rounding the corners of the cutting edges of the die and/or punch.

It will also be realized that other modifications of the instant invention may be readily practiced. Thus, by forming the punch cutting edge 30 of FIG. 5, with a sharp corner, the upwardly extending burr 20 could be omitted. As a result, the burr 38 alone would perform the sealing action, and being disposed on the inside of the end 10, would not produce the mechanical interlock which the burr 20 provides. Thus, the closure member 16 could be very easily depressed to open the container. In similar manner the upwardly extending burr 20 could be provided on the cut edge 22 of the container end 10, or alternatively, the downwardly extending burr 38 provided on the cut edge 21 of the closure member 16.

It will be obvious that the closure 16 is not designed to be used as a reclosure after it has been depressed into the container. Thus, it is contemplated that the finished container be provided with a separate reclosure in the form of a slip cover or dredge slide. Since reclosures of this type are well known in the art, it has not been thought necessary to illustrate them in the instant drawings.

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 of its material advantages, the forms hereinbefore described being merely preferred embodiments thereof.

I claim:

1. The method of producing a sift-proof closure for a dispensing opening in a container member, the steps of severing a closure member from a member of the container to form the dispensing opening therein defined by a line of severance and simultaneously forming a burr on the cut edge of one of said members, placing said closure member in said dispensing opening, and pressing said burr over said line of severance and against a surface of the other of said members adjacent said dispensing opening to seal said line of severance.

2. The method of claim 1 wherein said line of severance is interrupted so that a portion of said closure member remains integral with said container portion thereby to provide a hinge for said closure member.

3. The method of claim 1 wherein said burr is formed on the cut edge of said closure member.

4. The method of claim 3 wherein simultaneously with said severing step a burr is formed on the cut edge of said container member adjacent the surface thereof opposite to said surface against which said closure member burr is pressed, and wherein said container member burr is pressed over said line of severance and against said closure member in sealing relationship therewith.

5. The method of producing a hinged sift-proof closure for a dredge opening in the end portion of a container, comprising the steps of severing a substantial part of a closure member from said end portion to produce a dredge opening therein and simultaneously forming an outwardly extending burr on the cut edge of said closure member, the portion of said closure member remaining unsevered serving as a hinge to connect said closure member and said end portion, placing said closure member within said dredge opening, and pressing said burr over the adjacent outer surface of said end portion into sealing engagement therewith.

6. The method of claim 5 wherein an inwardly extending burr is formed simultaneously with said severing step on the cut edge of said end portion defining the dredge opening, and wherein said inwardly extending burr is

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pressed over and against the adjacent inner surface of said closure member into sealing engagement therewith.

7. The method of producing a sift-proof closure for a dredge opening in a portion of a container, comprising the steps of placing said container portion on a die having an aperture therein of a predetermined size and shape underlying said container portion, moving into said die aperture a punch having a rounded cutting edge and a cross-section of substantially the same size and shape as that of said aperture to thereby sever a closure member with a burr on the cut edge thereof from said container portion and to produce a dredge opening in said container portion, inserting said closure member in said dredge opening, and pressing said burr over and against a surface of said container portion adjacent thereto to seal the line of severance between said closure member and said container portion.

8. The method of claim 7 in which said die has a rounded cutting edge adjacent said die aperture, whereby when said punch is moved into said die aperture a second burr is formed on the cut edge of said container portion adjacent the opposite surface thereof, and wherein said second burr is pressed over said line of severance into sealing engagement with said closure member.

9. The method of producing a sift-proof closure for a dredge opening in a portion of a container, comprising the steps of placing said container portion on a die having an aperture therein of a predetermined size and shape underlying said container portion, moving into said die

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aperture a punch having a rounded cutting edge and a cross-section of a size slightly smaller than and of a shape substantially the same as that of said die aperture, said punch severing a closure member with a first burr on the cut edge thereof from said container portion to produce a dredge opening therein and forming a second burr on the cut edge of said container portion extending in a direction opposite to that of said first burr, inserting said closure member in said dredge opening, and pressing said first burr against the adjacent surface of said container portion and said second burr against the adjacent surface of said closure member to seal the line of severance between said closure member and said container portion.

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