Aug. 29, 1967 H. R. BARD 3,338,465

END CLOSURE CONSTRUCTION FOR RECLOSURE TYPE CONTAINERS

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Fig. 1.

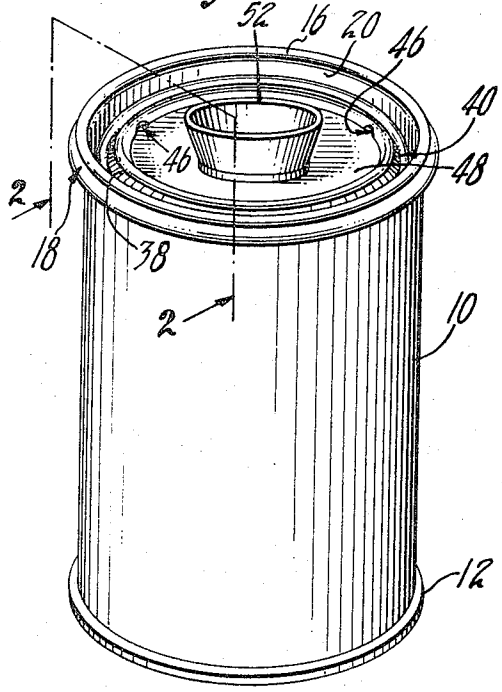


Fig. 2.

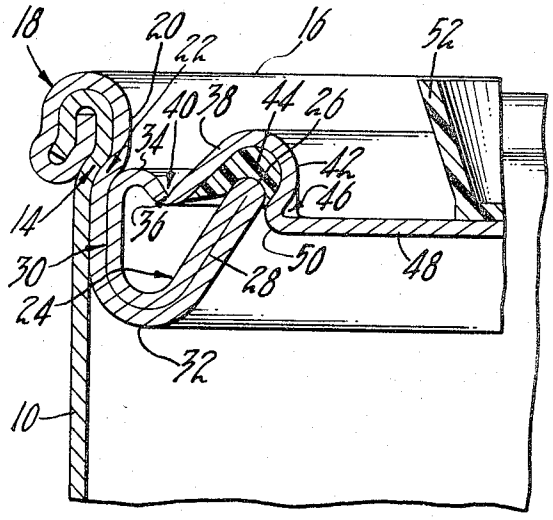


Fig. 3.

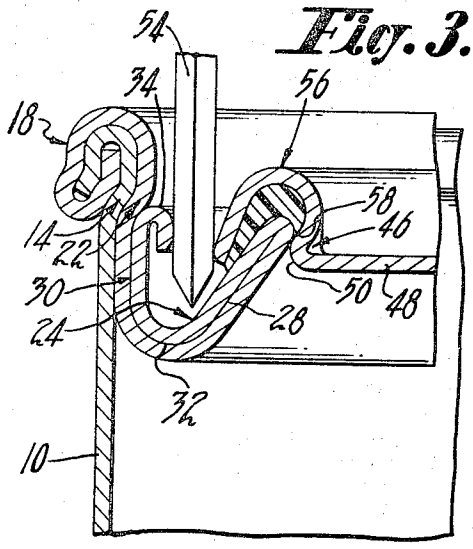
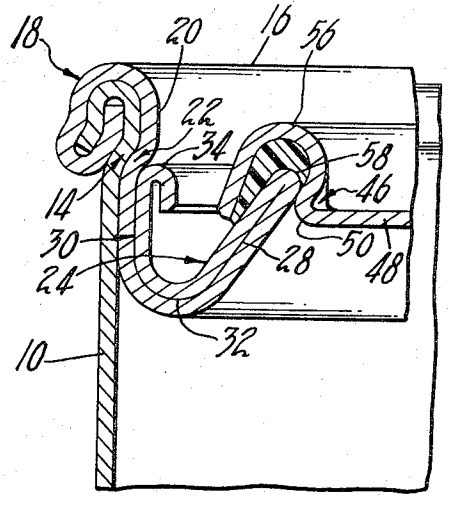


Fig. 4.



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END CLOSURE CONSTRUCTION FOR RECLOSURE TYPE CONTAINERS

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ABSTRACT OF THE DISCLOSURE

A reclosure-type hermetic container has an end closure wherein an annular cylindrical wall extends downwardly from the countersink wall and an annular inclined wall extends upwardly and inwardly from the bottom of the cylindrical wall to engage the bottom of the central panel at a location on the panel covered with gasketing material, the central panel being joined at its periphery with the top of the cylindrical wall so that when the central panel is opened by passing an opening tool through the central panel between the inner end edge of the inclined wall and the cylindrical wall there is formed a removable area which can be lifted off of the container to form an opening but which may be placed back on the container to close it.

The present invention relates to cans or containers which, after being opened, are utilized as canisters to hold products normally used in small quantities. It has particular reference to an end closure construction comprising an inwardly directed annular ledge and a central panel which is readily severed by an ordinary can opener and thereafter employed as a reclosure member by forcing a sealing material located within the central panel against the inwardly directed ledge to form an air-tight reclosure seal therebetween.

Certain hermetically sealed containers effect an air-tight reclosure seal by cutting into a doubleseam to expose a sealing compound located therewithin. Such containers provide an adequate reclosure seal but special can openers are required to cut into the doubleseam. The presently marketed hermetically sealed containers, which afford a reclosure operation through the cooperation of the end closure and the container body, require fabrications of both the end closure and the container body.

Since special equipment is required to fabricate the container end closure and the container body, the commercial employment of reclosure containers has been inhibited. Ideally, the end closure should be fabricated to form both the reclosure sealing surface and the removable reclosure member. Such a fabricated end closure would naturally allow the employment of a conventional unfabricated container body as part of a reclosure type container. Additionally, since fibre and plastic do not lend themselves to such fabrication, the employment of containers of this type as part of a reclosure container construction has been virtually impossible.

Further, when the conventional metallic end closure is fabricated to form a reclosure type container, very often the opening of the container is difficult because the fabrications tend to reduce the strength of the end closure. This condition renders the opening of the end closure by a conventional can opener difficult since the weak end closure causes paneling or buckling; and, in consequence, the can opener cutting tool does not sever the end closure.

An object of the present invention is to provide a container end closure which eliminates the above-discussed problems.

Another object is to provide a container end closure which includes a self-contained reclosure feature.

An additional object is to provide a container end closure which, after severance from a can body, may be reassociated therewith to form an air-tight seal.

A further object is to provide a container end closure which can be readily employed with container bodies fabricated from metal, fibre, or plastic to form a reclosure container.

Still another object is to provide a reinforced container end closure to facilitate severance of the end closure by a conventional can opener.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in conjunction with the accompanying drawings, discloses a preferred embodiment thereof.

The above objects are accomplished by providing a container end closure with an inwardly directed extension of its countersink wall forming a ledge which cooperatively associates with an annular recess containing a suitable sealing material. When the end closure is severed by a cutting tool between the end closure periphery and the annular recess, the central portion of the end closure may be employed as a reclosure seal by positioning the sealing material against the inwardly directed ledge.

Referring to the drawings:

FIG. 1 shows a perspective view of a container embodying the instant invention;

FIG. 2 is an enlarged fragmentary sectional view of the upper part of the container and end closure construction taken substantially along the line 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary sectional view showing a can opener in place and in the operation of severing the end closure adjacent the end seam; and

FIG. 4 is an enlarged fragmentary sectional view, illustrating the reclosure portion of the end closure in its seated position after the container has been opened.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate a tubular can body **10**. The lower end of the tubular can body **10** is suitably closed such as with a conventional end closure secured to the body **10** by a doubleseam **12**. The upper end of the tubular can body **10** is curved inwardly to form an arcuate annular wall **14** for reasons which will be more fully expalined hereinafter. A metallic stepped end closure, generally designated **16**, is attached to the upper end of the tubular body by a doubleseam **18**. The double seaming of the end closure **16** forms a conventional countersink wall **20**. The lower end of the countersink wall **20** merges with a curved depending wall **22** located adjacent to and in contiguous relation with the arcuate wall **14** of the container body.

The arcuate wall **14** and the curved depending wall **22** are formed, after the doubleseaming operation, by forcing the upper portion of the double seam **18** inwardly, while the lower interior portion of the doubleseam is supported. By forcing the upper portion of the double seam **18** inwardly, the annular wall **14** and the depending wall **22** are positioned radially outwardly of the countersink wall **20**. By forcing the upper portion of the doubleseam inwardly to the illustrated position, the doubleseam positions a conventional can opener cutting tool within a guide channel described hereinafter.

The end closure **16** is folded immediately below the countersink wall **20** to form a strong, rigid-like inwardly directed ledge generally designated **24**. The folding of the end closure **16** produces two contiguous, co-extensive layers of metal which merge at their inner extremities to form an annular sealing surface **26**. To support

the end closure during severing to open the container, the sealing surface **26** is forced into a suitable sealing compound described hereinafter. The two contiguous layers of metal form an inclined wall **28**. a cylindrical wall **30** and an arcuate wall **32** which merges with the inner extremity of the inclined wall and the lower extremity of the cylindrical wall. The upper end of the outside and inside layers of the cylindrical wall **30** merges, respectively, with the curved depending wall **22** and a curved annular shoulder **34**.

Additional rigidity of the ledge **24** is obtained by locating the periphery of the cylindrical wall **30** against the inside surface of the tubular can body **10**. This location allows the ledge **24** to contribute maximum support of the end closure **16** during severance thereof as will be explained more fully hereinafter.

The upper surface of the end closure **16** is provided with a score line **36** adjacent the inner extremity of the curved annular shoulder **34**. To insure severance of the end closure **16** at or very close to the score line **36**, the end closure is provided with a sloping annular wall **38**. The sloping annular wall **38** and the curved annular shoulder **34** define a guide channel **40**. The base of the guide channel **40** is located at the score line **36**.

The sloping annular wall **38** merges with a vertical wall **42** to form a step and an annular cavity within which suitable plastisol sealing compound **44** is placed. To insure good adhesion of the plastisol **44**, it is preferred to apply a primer or bonding coat, such as epoxy phenolic resin, to the undersurface of the sloping annular wall **38** and the adjacent upper surfaces of the vertical wall **42**. The plastisol **44** is then extruded onto these coated surfaces. The particular plastisol employed herein is a blown, foamed vinyl resin plastisol.

The periphery of the vertical wall **42** is provided with three equally spaced locking or projecting lugs **46** which retain the central portion of the end closure **16** in a reclosed position after severance thereof along the doubleseam **18**. The end closure **16** is completed by a flat central panel or disc **48** and a curved section **50** which joins the lower end of the vertical wall **42** and the periphery of the central panel. For easy handling of the end closure after its severance from the body **10**, a molded plastic knob **52** is heat sealed to the flat central panel **48**.

To open the instant container any of the commercial can openers may be employed. In the opening operation, a cutting tool **54** is located in the annular guide channel **40**, after which the cutting tool is forced to travel around the periphery of the container to form a reclosure member **56** as shown in FIG. 4. As previously dfiscussed, the doubleseam **18** is forced inwardly to thereby locate the cutting edge of the cutting tool **54** within the guide channel **40** above the score line **36**. During severance of the end closure, the cutting tool **54** is forced to follow the base of the annular guide channel **40** and sever the end closure at the score line **36**.

As previously discussed, the location of the periphery of the cylindrical wall **30** against the inside surface of the tubular can body **10** adds to the rigidity of the ledge **24**; further ledge rigidity is derived from the inherent strength of the contiguous, co-extensive layers of metal by which the ledge is formed. By forcing this strong rigid ledge **24** within the plastisol **44**, the end closure is effectively supported when the end closure is severed. Such support has eliminated paneling or bending of the end closure during severance thereof. For this reason, the score line **36**, although facilitating opening, is not truly essential.

Upon completion of the opening operation, the periphery of the sloping annular wall **38** is forced within the plastisol **44** and the innermost edge of the curved annular shoulder **34** is located within the inwardly directed ledge **24** to a position in which the edge is incapable of inflicting injury to the consumer.

The sealed position of the reclosure member **56** is illustrated in FIG. 4. As the three projections **46** are forced against an annular curved surface **58** of the inclined annular wall **28** during reclosure, the projection having the least resistance will move along the arcuate surface **58** and under the inclined annular wall. The same operation provides for the displacement of the second projection **46** along the curved annular surface **58** and under the inclined wall **28**. When the last projection **46** is forced along the annular curved surface **58**, an interference fit exists therebetween which causes the inclined annular wall **28** to flex inwardly to allow the projection to move around the curved surface **58** and under the inclined annular wall. In this position the plastisol **44** is again compressed between the sealing surface **26** and the reclosure member **56** to form an air-tight seal. This compression of the plastisol **44** causes it to be displaced along the sealing surface **26** and the upper surface of the inclined annular wall **28**. The projections **46** act as a locking means and insure the retention of the reclosure member in a sealed position until the reclosure member **56** is removed.

The manner in which the projections **46** are displaced along the inclined annular wall **28** during the removal of the reclosure member **56** is similar, but in the reverse direction, to the reclosing operation discussed above. When the reclosure member **56** is lifted vertically, the projection **46** with the least resistance will move along and above the inclined annular wall **28**. The remaining two projections **46** will follow in rapid succession, since very little resistance between these projections and the inclined annular wall **28** exists after the first projection passes the inwardly directed ledge.

From the above discussion, it is readily apparent that the seal and the ledge of the instant end closure construction coact to provide a self-contained reclosure seal. While this end closure construction is illustrated in combination with a metallic can body, it will be readily understood that the end closure could be employed with plastic or fibre container bodies. When employed with such container bodies, the upper portion of the container body is also provided with an arcuate annular wall below the doubleseam to facilitate the employment of a conventional can opener. This annular wall does not impair the strength of fibre can bodies. A fibre container body is preferably attached to the instant end closure by a single seam. A tubular or closed plastic container may be attached by a single or double seaming operation, depending, of course, on the particular packaged product. By employing the instant reinforced end closure construction with fibre or plastic container bodies, considerable support for the non-metallic container bodies is contributed by the end closure.

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 parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A reclosure-type container end closure comprising an annular countersink wall, an annular cylindrical wall extending downwardly from said countersink wall, an annular inclined wall extending upwardly and inwardly from the bottom of said cylindrical wall, a central panel joined at its periphery with the upper portion of said cylindrical wall and passing over the uppermost part of said inclined wall, and gasketing material in tight engagement with said uppermost part disposed on the bottom surface of said central panel, said central panel, inclined wall, cylindrical wall and countersink wall being one integral unit.

2. The end closure defined in claim **1** wherein said cylindrical wall and said inclined wall are of two layers of sheet material, one layer merging with said countersink wall, the other layer marging with said central panel.

3. The end closure defined in claim 1 wherein said central panel includes an annular cavity opening into the bottom of said panel, said gasketing material being within said cavity.

4. The end closure defined in claim 3 wherein said annular cavity has outwardly projecting lugs which project under a portion of said inclined wall to urge said inclined wall against said gasketing material.

5. The end closure defined in claim 4 wherein said central panel includes a curved annular shoulder contiguous to said countersink wall and a sloping annular wall which extends upwardly and inwardly from the bottom of said curved annular shoulder, said curved annular shoulder and said sloping annular wall defining between them a guide channel whereby the cutting edge of a cutting tool used to cut through said central panel will be guided to tear said central panel between said inclined wall and said cylindrical wall.

6. The end closure defined in claim 5 further comprising a knob disposed on said central panel to provide a handle for the portion of the central panel separated from the remainder of the end closure after the opening operation.

7. A reclosure-type container having a tubular body and an end closure said end closure comprising an annular countersink wall, an annular cylindrical wall extending downwardly from said countersink wall, an annular inclined wall extending upwardly and inwardly from the bottom of said cylindrical wall, a central panel joined at its periphery with the upper portion of said cylindrical wall and passing over the uppermost part of said inclined wall, and gasketing material in tight engagement with said uppermost part disposed on the bottom surface of said central panel, said central panel, inclined wall, cylindrical wall and countersink wall being one integral unit.

8. A reclosure-type container defined in claim 7 wherein said cylindrical wall and said inclined wall are of two

layers of sheet material, one layer merging with said countersink wall, the other layer merging with said central panel.

9. The reclosure-type container defined in claim 7 wherein said central panel includes an annular cavity opening into the bottom of said panel, said gasketing material being within said cavity.

10. The reclosure-type container defined in claim 9 wherein said annular cavity has outwardly projecting lugs which project under a portion of said inclined wall to urge said inclined wall against said gasketing material.

11. The reclosure-type container defined in claim 10 wherein said central panel includes a curved annual shoulder contiguous to said countersink wall and a sloping annular wall which extends upwardly and inwardly from the bottom of said curved annular shoulder, said curved annular shoulder and said sloping annular wall defining between them a guide channel whereby the cutting edge of a cutting tool used to cut through said central panel will be guided to tear said central panel between said inclined wall and said cylindrical wall.

12. The reclosure-type container defined in claim 11 further comprising a knob disposed on said central panel to provide a handle for the portion of the central panel separated from the remainder of the end closure after the opening operation.

References Cited

UNITED STATES PATENTS

2,142,743	1/1939	Calleson	220—66
2,348,750	5/1944	Peck	220—54
2,430,036	11/1947	Thornburgh et al.	220—54
3,023,927	3/1962	Ehman	220—66
3,208,627	9/1965	Lipske	220—54

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