Dec. 23, 1969 S. S. MIRASOL, JR 3,485,436

CONTAINER ASSEMBLY STRUCTURE

Filed Nov. 20, 1967 2 Sheets-Sheet 1

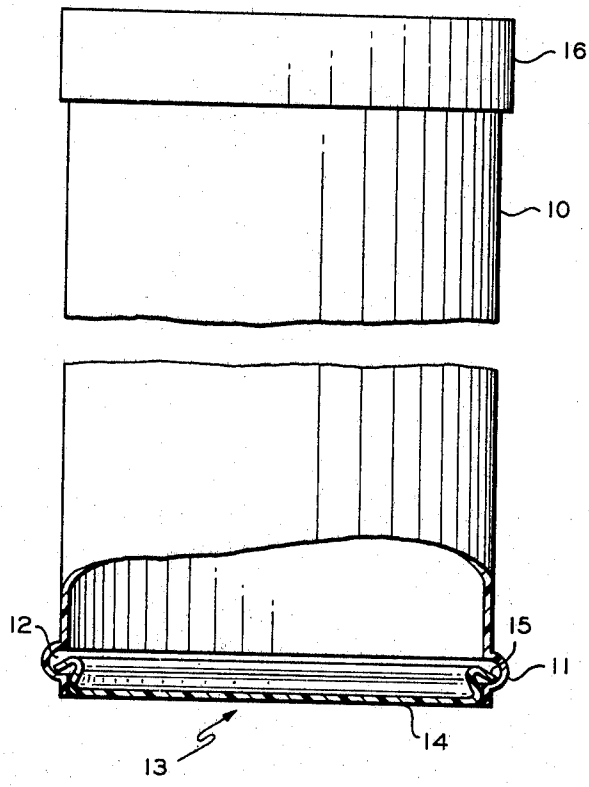


FIG. 1

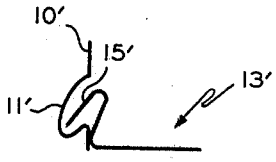


FIG. 3

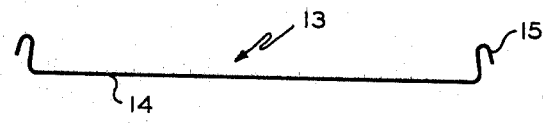


FIG. 2a

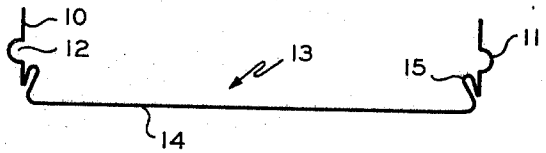


FIG. 2b

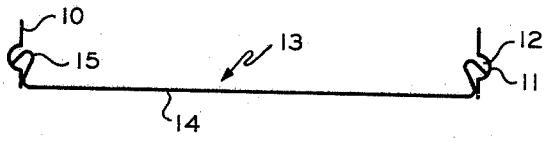


FIG. 2c

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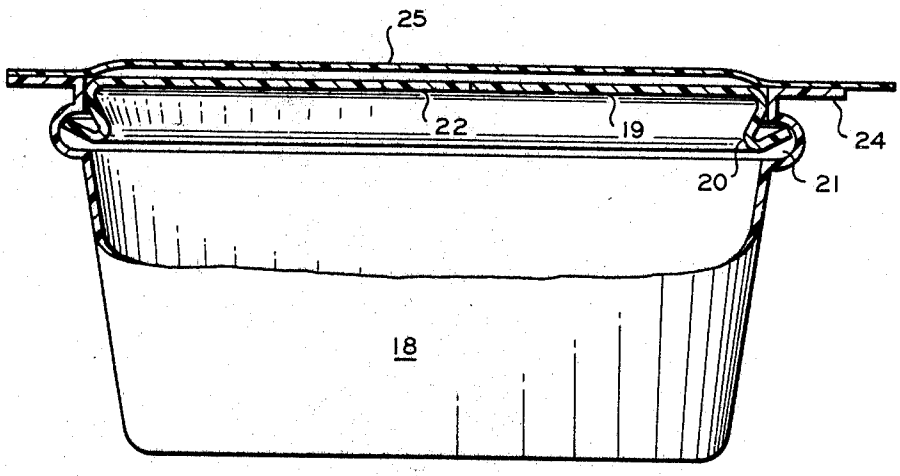


FIG. 6

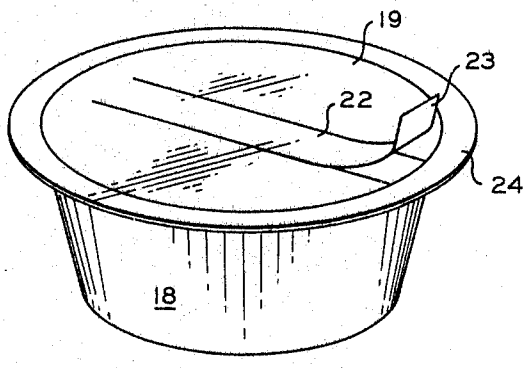


FIG. 5

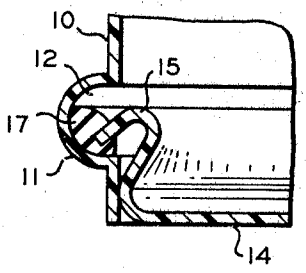


FIG. 4

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CONTAINER ASSEMBLY STRUCTURE

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U.S. Cl. 229—51 7 Claims

ABSTRACT OF THE DISCLOSURE

A container is formed of a body member and a closure member. The body member is provided with a recess near the end to receive the rim of the closure member. The rim is of such configuration as to permit the container to be assembled by inserting the closure member. However, the rim then locks in position to resist withdrawal of the closure member.

This invention relates to locking mechanisms for securing closure members to body members to form containers.

It is common practice in the packaging industry to form containers of plastic materials, particularly for use as disposable items. However, a continuing need exists for containers which are of inexpensive construction and for containers which have tamper-proof closure members.

In accordance with the present invention, containers which fulfill these requirements are provided. A body member is provided with a recess into which a closure member is inserted. The closure member is formed of resilient material and is of such configuration that the edges can be deformed to be inserted into the recess of the body member when the container is assembled. The edges then expand into the recess to form a locking mechanism which prevents or limits removal of the closure member. In this manner, a container with a tamper-proof closure is provided. The locking mechanism can also be employed to advantage to form inexpensive containers which utilize tubular members for the bodies.

Accordingly, it is an object of this invention to provide an improved method of manufacturing containers.

Another object is to provide containers having bottoms and/or tops that are locked to the sidewalls of the container.

Another object is to provide novel tamper-proof containers.

Other objects, advantages and features of the invention should become apparent from the following detailed description in conjunction with the accompanying drawing in which:

FIGURE 1 is a view, shown partially in section, of a first embodiment of a container formed in accordance with this invention. FIGURES 2*a*, 2*b* and 2*c* are schematic illustrations of the locking feature of the container construction of this invention. FIGURE 3 is a schematic representation of a modified embodiment of the locking feature of this invention. FIGURE 4 is a sectional view of a modified form of the locking structure of this invention. FIGURE 5 illustrates another embodiment of a tamper-proof container formed in accordance with this invention. FIGURE 6 is a view shown partially in section, of a modified form of the container of FIGURE 5.

Referring now to the drawing in detail and to FIGURE 1 in particular, there is shown a container which is formed of a generally cylindrical plastic tubular body member **10**. The lower end of member **10** is provided with an outwardly bulged section **11** which provides an annular recess **12** of generally semi-circular configuration. A closure member **13** is inserted into body member **10** to form the bottom of the container. Closure member

13 comprises a generally flat cylindrical disk **14** which has an outwardly extending hook-shaped rim **15** that enters recess **12** when the closure member is inserted into the body member. The resulting container can be open at the top, or provided with any convenient type of lid **16**, depending on the purpose for which the container is to be used.

The operation of the locking mechanism of this invention is illustrated schematically in FIGURES 2*a*, 2*b* and 2*c*. Closure member **13** is formed so as to have a cross sectional configuration as illustrated in FIGURE 2*a*. This member is formed of a resilient material such that rim **15** can be deformed inwardly in the manner illustrated in FIGURE 2*b* to permit the closure to be inserted into recess **12** of member **10**. When rim **14** enters the recess, the resiliency of the material restores the rim to its initial configuration with the result that the rim extends into recess **12**, as illustrated in FIGURE 2*c*. The closure member is sufficiently rigid that the weight of the material to be packed in the container will not deform rim **15** sufficiently to cause the closure member to be separated from the body member. Thus, member **13** is locked into position to form the bottom of container **10**. Note that in FIGURE 2*c* the end of rim **15** contacts the wall **11** of recess **12** substantially normal to the wall of said recess. By "normal to" is meant the geometrical meaning of perpendicular to or at right angles to the wall. The relationship of normal to the wall of the recess makes it be in the position most difficult to remove.

A container of the general configuration of FIGURE 1 is particularly useful in packaging materials such as popcorn, potato chips and the like. The container can also be employed to pack relatively viscous materials, such as ice cream. A container of this type can be formed at relatively low cost because it is not necessary to employ either injection or blow molding techniques. Body member **10** can be formed in a conventional extruder by the use of appropriate movable molds which are clamped on the tube as it emerges from the extruder. These molds can be provided with a recess to form extended portion **11** into which the plastic material can be forced as it leaves the extruder, by the use of air pressure or a vacuum. The resulting tubing can subsequently be cut to length to provide body member **10**. Of course, such body members can be formed by other molding procedures if desired.

FIGURE 3 is a schematic illustration of a modified form of the closure mechanism of this invention. As illustrated, member **10'** is provided with an extended portion **11'** which is of a configuration similar to the configuration of rim **15'** of closure member **13'**, so that the rim mates with the recess. This provides a more positive lock if such is required or desired for a particular application.

If the container of FIGURE 1 is to be employed to hold a liquid, a sealant **17** can be positioned within recess **12**, as illustrated in FIGURE 4. Any suitable caulking or sealing material which is insoluble in the liquid to be packaged can be employed for this purpose.

In FIGURES 5 and 6 there is shown two similar embodiments of a container **18** which has a lid **19** secured thereto by the sealing mechanism of this invention. As illustrated in FIGURE 6, lid **19** is provided with a rim **20** which enters a recess **21** in the upper portion of container **18**. In order to permit removal of the lid after the container has been filled and closed, an opening mechanism such as a tear strip **22**, which has a tab **23** secured thereto, can be provided. This results in a tamper-proof container which can not be opened without removal of the tear strip and destroying or substantially deforming the container lid. If it is desired or necessary to form a sterile or leakproof package, a film **25** can be secured to the upper rim **24** of the container, as shown in FIG-

URE 6. This can be accomplished by heat sealing or the use of a suitable adhesive. Film **25** can extend over a portion of the rim to provide a gripping means for removal of the film. A container of this type can be used to advantage to pack dairy foods and the like which are normally consumed at one time.

If desired, the closure member of this invention can be formed of a material which is sufficiently flexible to permit removal of the closure by the application of sufficient force to withdraw the rim from the recess in the body wall. In such a construction, the closure can be provided with a suitable knob or recess to permit the closure to be gripped and removed.

Although the invention has been described and illustrated in conjunction with the formation of closures from plastic materials, it should be evident that any type of material can be used for the closure member which is sufficiently flexible to permit the rim to be deformed inwardly to enter the recess of the body member and then be restored to its initial position.

While this invention has been described in conjunction with present preferred embodiments, it should be evident that it is not limited thereto.

What is claimed is:

1. A container assembly comprising in combination:

a tubular body member having an open end and an outwardly extending annular recessed section formed in the interior of said body member adjacent said end, the closest portion of the inner wall of said recessed section to said end extending generally outwardly with respect to the axis of said body member;

a closure member having a generally plane central portion substantially filling said open end;

said closure member having an integral resilient rim extending upwardly from the peripheral edge of said central portion into said open end of said body member, the outer portion of said rim being bent back upon but spaced from itself extending outwardly and downwardly into the recess of said recessed section, the outer peripheral edge of said outer portion of said rim expanding outwardly into said recess into contact with and substantially normal to said closest portion of said recessed section upon insertion of said closure member in said end of said body member, thereby locking said closure member to said body member.

2. The assembly of claim **1** in which said body member has a re-entrant peripheral shoulder adjacent the outer edge of said recess to interlock with the rim of said closure member.

3. The combination of claim **1** wherein said closure member is formed in part of a tear strip disposed to be torn out to make removal of said closure member easier.

4. The combination of claim **1** in which a continuous strip of sealing material extends around the interior of said recess and is forced into airtight sealing relation between said body member and the rim of said closure member.

5. The combination of claim **1** in which a sealing film is secured to the end of said body member and extends across said closure member.

6. The combination of claim **1** in which said end of said body member is provided with an outwardly extending rim.

7. The combination of claim **6** in which a sealing film is secured to said rim and extends across said closure member.

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U.S. Cl. X.R.

150—.5; 220—54, 60, 69; 206—46; 229—43, 5.5