United States Patent [19]

Marion et al.

[11] **3,866,790**

[45] **Feb. 18, 1975**

[54] **CONICAL CONTAINER WITH DOME-SHAPE LID**

[75] Inventors: **Thomas E. Marion,** Baltimore; **Richard D. Collins,** Timonium, both of Md.

[73] Assignee: **Maryland Cup Corporation,** Owings Mills, Md.

[22] Filed: **Aug. 24, 1973**

[21] Appl. No.: **391,326**

Related U.S. Application Data

[62] Division of Ser. No. 269,304, July 6, 1972, Pat. No. 3,779,191.

[52] **U.S. Cl.** **220/67,** 220/200

[51] **Int. Cl.** **B65d 51/00**

[58] **Field of Search** ..... 220/24 R, 24 A, 66, 67, 220/77; 229/5.6

[56] **References Cited**

UNITED STATES PATENTS

1,190,723	7/1916	Caylor	220/24 A
1,590,753	6/1926	Hulbert	229/5.6
3,580,464	5/1971	Griffith	220/67 X

Primary Examiner—William I. Price
Assistant Examiner—Steven M. Pollard
Attorney, Agent, or Firm—Terrell C. Birch; Anthony L. Birch

[57] **ABSTRACT**

A method for securing a closure member in an open end of a container having a curled or rolled rim is described. Die elements are provided including a container holder, an external pressure pad, and a forming head. A container is supported in said holder and a closure member is inserted into said container just below the curled or rolled rim thereof where it is held in place by said pressure pad. The forming head is then actuated to force or roll the rimmed edge inwardly and crimp the same against the closure member to lock the closure member within said container.

2 Claims, 11 Drawing Figures

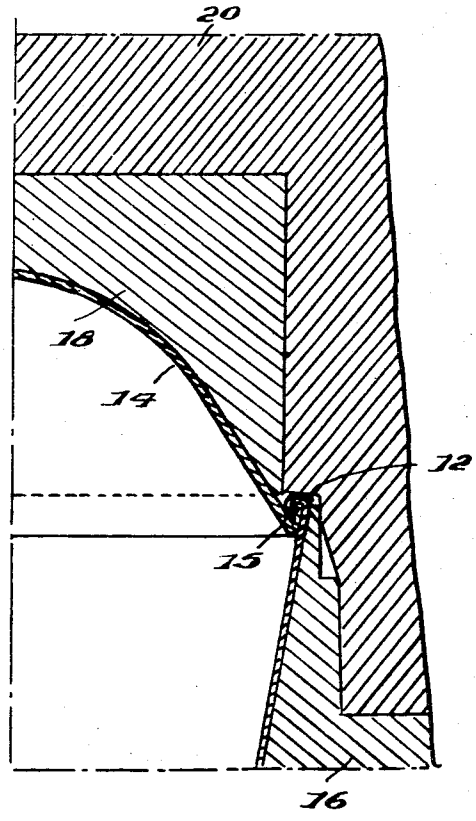


Fig. 1.

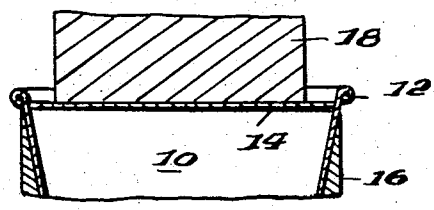


Fig. 2.

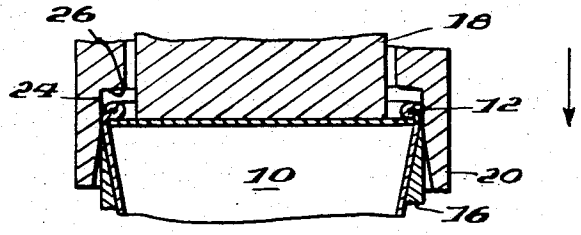


Fig. 3.

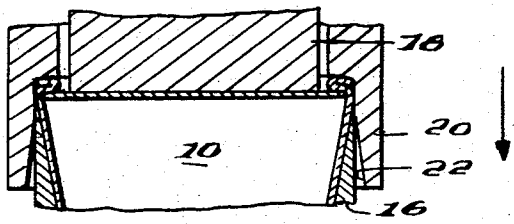


Fig. 4.

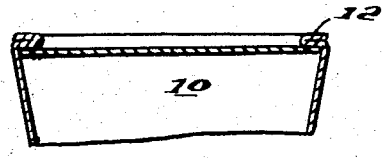


Fig. 5.

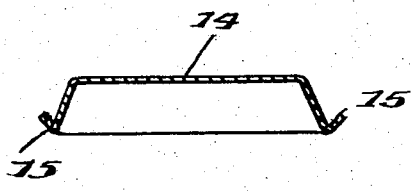


Fig. 6.

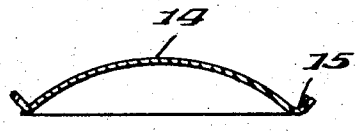


Fig. 7.

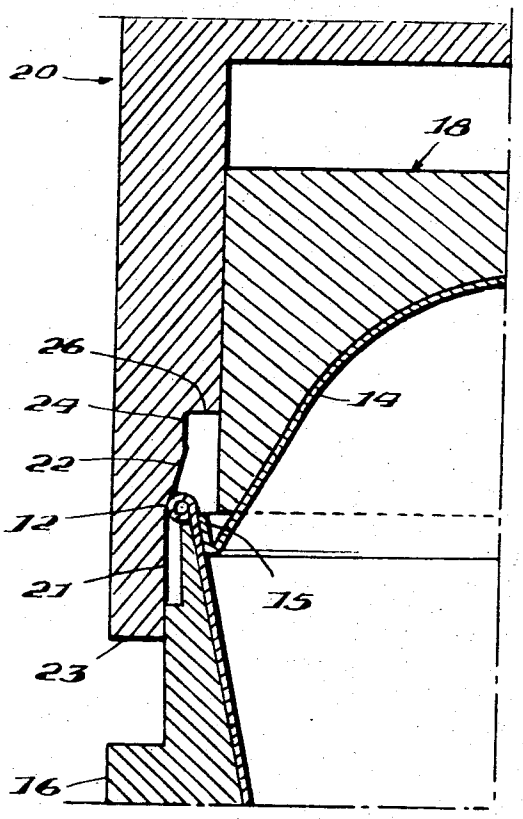


Fig. 8.

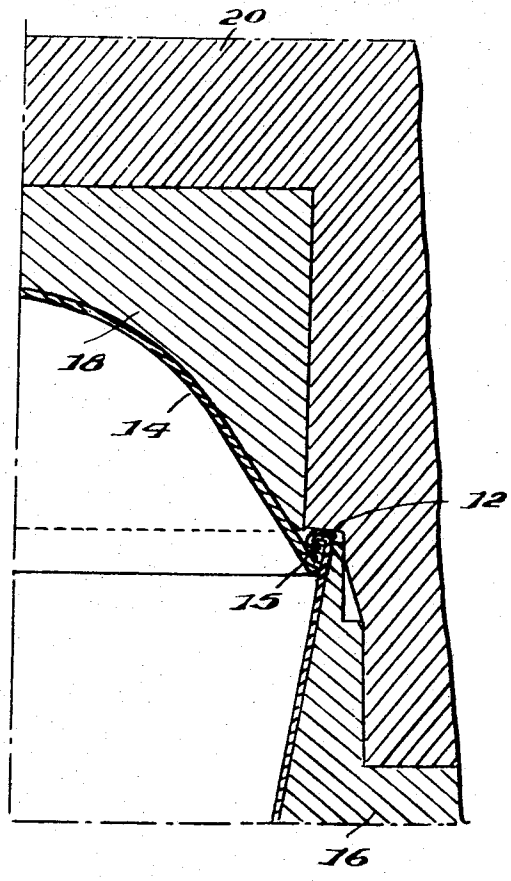


Fig. 10.

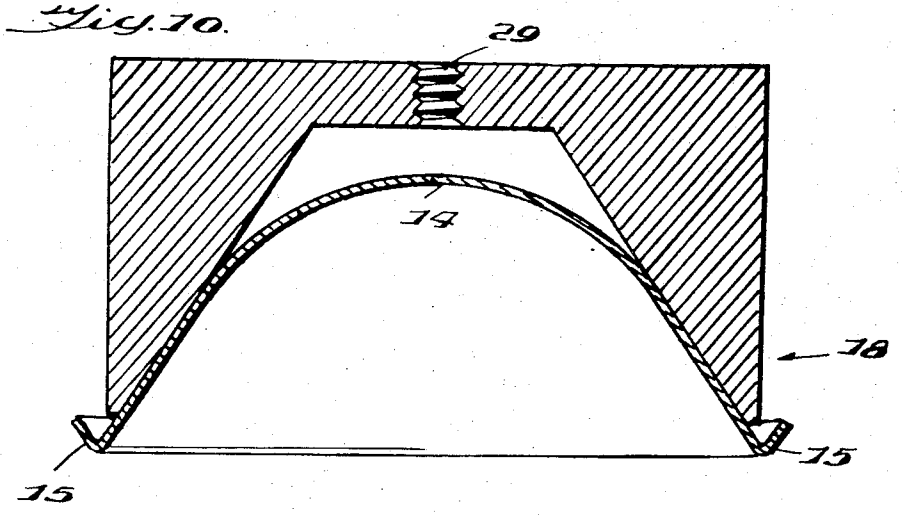


Fig. 9.

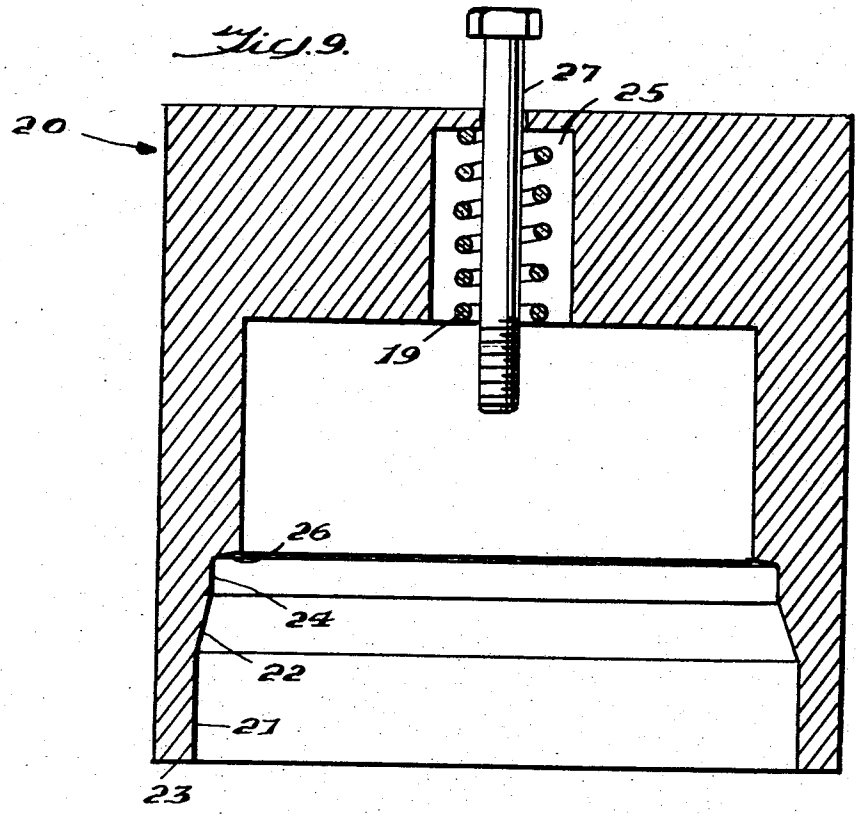
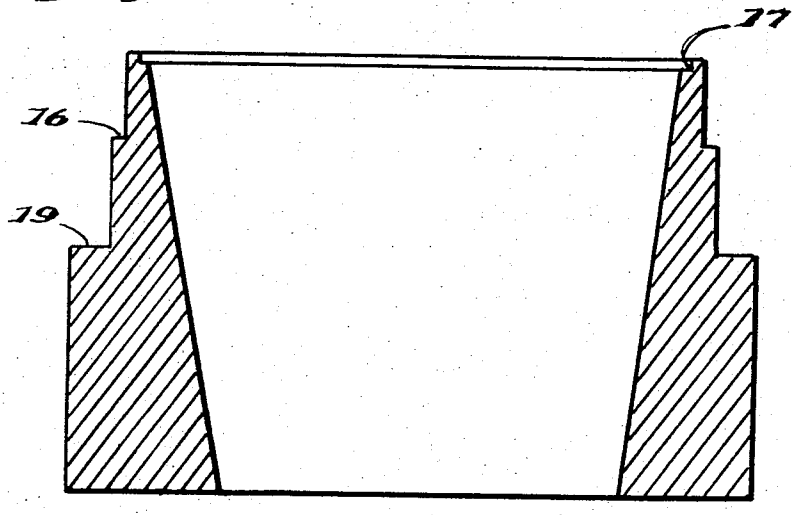


Fig. 11.



CONICAL CONTAINER WITH DOME-SHAPE LID

This is a division, of application Ser. No. 269,304, filed July 6, 1972, now U.S. Pat. No. 3,779,191.

This invention relates to a method for securing closure members within rimmed containers by rolling the rimmed edge inwardly over the closure member and crimping the same into an oval shape against the closure member. More specifically this invention relates to a novel forming head which facilitates the rolling and crimping of the rimmed edge.

Heretofore closure means have been secured into rimmed containers by the use of adhesives or heat sealing methods. These methods are not entirely satisfactory since extra steps and machinery are required for applying the adhesive material and drying the same.

Accordingly it is an object of the present invention to provide a method for securing closure members into containers having curled or rolled rims at the tops thereof without the use of adhesives or heat.

It is another object of the present invention to provide a method for securing closure members into the open end of a tapered or conical container having a curled or rolled edge at the open end thereof.

It is a further object of the present invention to provide a novel forming head for carrying out the method of the present invention.

It is still a further object of the present invention to provide several forms of closure members for insertion into the containers of the present invention.

These and other objects of the present invention and attendant advantages thereof will become more apparent with reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. **1** is a partial side elevational view showing a container disposed in the holder of the present invention and a closure member of a first embodiment of this invention held in place by the pressure pad.

FIG. **2** is a similar view illustrating the forming head of the present invention contacting the rimmed edge of the container of FIG. **1** and forcing the same inwardly of the container.

FIG. **3** is a similar view to FIGS. **1** and **2** illustrating the crimping action of the forming head of the present invention against the rimmed container edge.

FIG. **4** is a partial view of the top portion of the container of the present invention illustrating the closure member of FIG. **1** locked in its final position.

FIG. **5** is a diagramatic side view of another form of closure means for use in the method of present invention.

FIG. **6** is a diagramatic side view of still another form of a closure means for use in the method of the present invention.

FIGS. **7** and **8** are elevational views illustrating a method and apparatus for securing the closure member of FIG. **5** into a container of the present invention.

FIG. **9** is a side view in section of the forming head of the present invention.

FIG. **10** is a side view in section of the pressure pad of the present invention for use with the closure members of FIGS. **5** and **6.**

FIG. **11** is a side view in section of the container holder of the present invention.

Referring to FIGS. **1** to **4** of the drawings in more detail there is illustrated a container **10** which is shown as being of a tapered or conical configuration. However, container **10** may be of any other suitable shape without departing from the spirit and scope of this invention. Container **10** is provided with a curled or rolled edge which forms a rim **12** around the top or open end thereof. A closure member or disc **14** is inserted in container **10** just below rim **12.** A container holder **16** is provided to support the walls of container **10** while carrying out the method of the present invention. A pressure pad **18** is provided to hold disc **14** in place against the interior walls of container **10.** A forming head **20,** having an axial bore therein which fits over and around container **10,** container holder **16,** and pressure pad **18,** is provided for camming rim **12** inwardly and crimping the same against disc **14** as forming head **20** is moved in the direction of the arrows indicated in FIGS. **2** and **3.**

Forming head **20,** the details of which are best illustrated in FIG. **8,** is provided with an interior bore **21** substantially corresponding to the exterior shape of the container and rim to be crimped. The diameter of the bore is stepped inwardly to define a plurality of juxtaposed annular surfaces of different diameters. The first step defines an annular camming surface **22** which tapers inwardly toward the interior of the bore. The function of camming surface **22** is to force curled rim **12** inwardly as forming head **20** is moved in the direction of the arrow in FIG. **2.**

A second step defines a second annular surface **24** in juxtaposition to surface **22.** Surface **24** acts to hold curled rim **12** in its inwardly rolled position until a third step defining an annular crushing surface **26** in the interior bore of head **20** makes contact with rim **12** and crimps it against disc **14** thereby locking it within container **10.** Crushing surface **26** is also tapered inwardly to form a camming surface. This tapered configuration of crushing surface **26** enhances the inward movement of curled rim **12** and results in the rim being moved down and over disc **14** during the crimping operation. The tapered crushing surface **26** also facilitates the formation of an oval shaped crimp as shown in FIG. **4** which provides a superior locking function compared to merely crushing the curled rim **12** flatly against disc **14.**

An unique feature of the present invention is that no seat is necessary for the closure means **12** within the interior of container **10.** Therefore, all of the die elements are located externally of container **10** which simplifies the handling of the containers and the design of the crimping machine.

Closure member **14** may be a flat disc as shown in FIGS. **1** to **4** or may be shaped as shown in FIGS. **5** or **6.** As shown in FIGS. **5** and **6** closure member **14** may be in the shape of a dome with a substantially curved profile and an annular upwardly turned V-shaped flange **15** around the perimeter thereof. A disc of this type facilitates an even better locking action than a flat disc when used in the method of the present invention.

The dies for securing the lids of FIGS. **5** and **6** and the operation of the same are illustrated in FIGS. **7** and **8.** FIG. **7** illustrates forming head **20** in its upper most position with dome-shaped closure member **14** held within holder **16** by pressure pad **18.** As shown in FIGS. **7** and **8** pressure pad **18** may be shaped to conform to the external shape of dome-shaped closure member **14.** However, pressure pad **18** may also be flat, as illustrated in FIGS. **1** to **3** or of the configuration shown in FIG. **9.** As illustrated diagramatically in FIGS. **7** and **8**

pressure pad **18** in a preferred embodiment fits within the bore of forming head **20** and is spring loaded within the same by a coil spring (not shown). In FIG. **8** forming head **20** is shown in its lower most position, which it occupies when the crimping step is completed.

Viewing both FIGS. **7** and **8** together the method of present invention can be readily understood. As forming head **20** moves in a downward direction, inwardly sloping camming surface **22** contacts rolled rim **12** and forces it inwardly. As forming head **20** continues to move in a downward direction annular surface **24** holds rim **12** in its inward position until it is contacted by crushing surface **26.** Crushing surface **26** forces rim **12** further inwardly, due to its inwardly sloping surface, and pushes rim **12** into V-shaped flange **15** of closure member **14.** As crushing surface **26** continues downwardly rim **12** and flange **15** are crimped together thereby locking closure member **14** in container **10.**

As best illustrated in FIG. **10** holder **16** is provided with an interior step or groove **17** around the top rim thereof. Step **17** acts as a seat for closure member **14** during the crimping operation.

The forming head, pressure pad, and holder for use in the present invention are shown in more detail in FIGS. **9, 10** and **11,** respectively. Pressure pad **18** of FIG. **10** is designed to fit wholly within bore **21** of forming head **20** of FIG. **9.** In a preferred embodiment pressure pad **18** may be spring loaded within the bore of forming head **20** by providing a central bore **25** in forming head **20** for receiving a coil spring **19** disposed about a bolt **27.** Bolt **27** is adapted to move freely in bore **25** but is secured to pressure pad **18** by screwing the bottom end thereof into threaded bore **29.** See FIG. **10.** Forming head **20** is adapted to fit over holder **16** so that in its downward position end surface **23** of forming head **20** will seat against an external step **19** on holder **16.**

The container and closure means of the present invention may be formed of paper, plastic, metal, or any other suitable material which may be bent and crimped in accordance with the method of the present invention.

It should be understood that the method and apparatus of the present invention may be modified and changes made therein, as will appeal to those skilled in the art without departing from the spirit and scope of the invention.

We claim:

1. A package comprising a conical container having an outwardly curled rim around an open end thereof in combination with a dome-shaped closure means having an annular flange, said dome shaped closure means being secured in said open end of said conical container by crimping said curled rim and annular flange together, said curled rim being constrained inboard of said container and crushed into juxtaposition with said annular flange.

2. A package according to claim **1,** wherein said annular flange extends upward from the base of said dome shaped closure means.

* * * * *