United States Patent

[11] **3,567,058**

[72] Inventor **Carmen T. Mascia**
Westchester, Ill.

[21] Appl. No. **833,541**
[22] Filed **June 16, 1969**
[45] Patented **Mar. 2, 1971**
[73] Assignee **Continental Can Company, Inc.**
New York, N.Y.

[54] **SAFETY CLOSURE**
5 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **215/9,** 220/40
[51] **Int. Cl.** **B65d 55/02,** B65d 55/12
[50] **Field of Search** 220/40; 215/9, 47

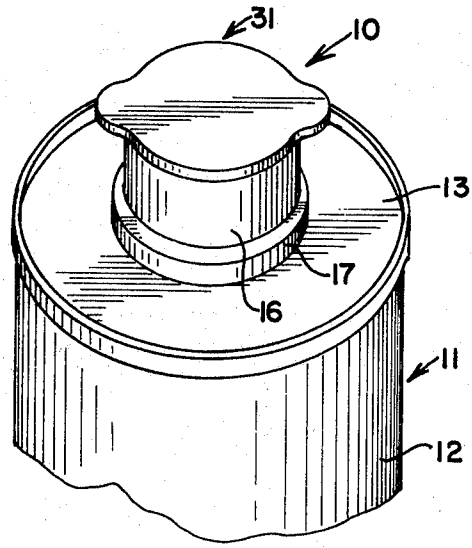
[56] **References Cited**

UNITED STATES PATENTS

3,430,796	3/1969	Berg	215/9
3,422,977	1/1969	Shaw	215/9

Primary Examiner—George T. Hall
Attorneys—Fred P. Kostka, Joseph E. Kerwin and William A. Dittmann

ABSTRACT: A safety closure including three components having interacting means which require a combination of linear and rotary movements to open and close the closure. The closure components must be aligned in specified positions prior to changing from a linear or rotary movement.



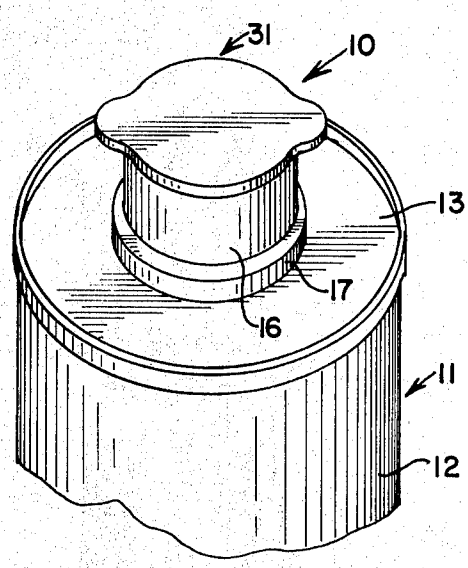


FIG. 1

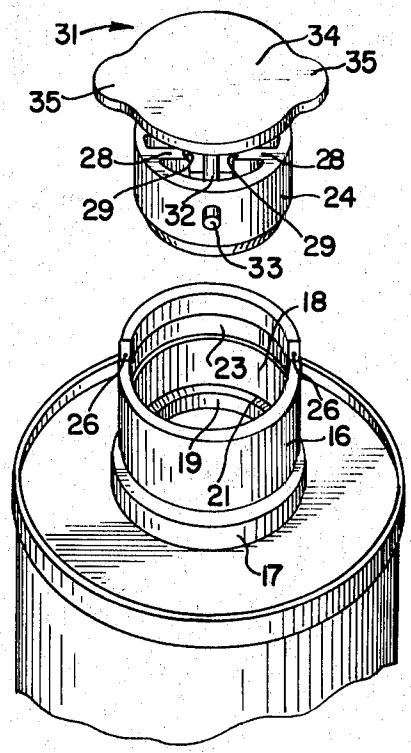


FIG. 2

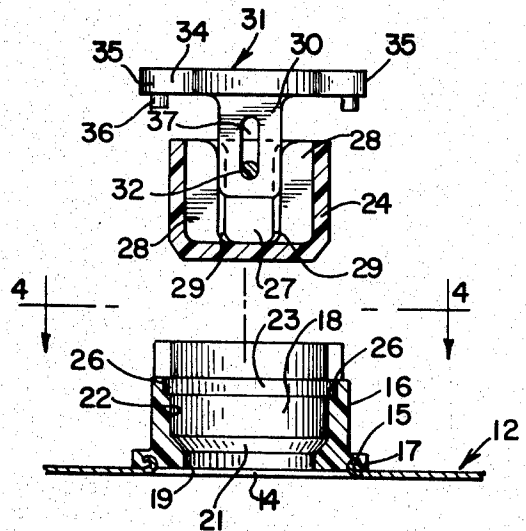


FIG. 3

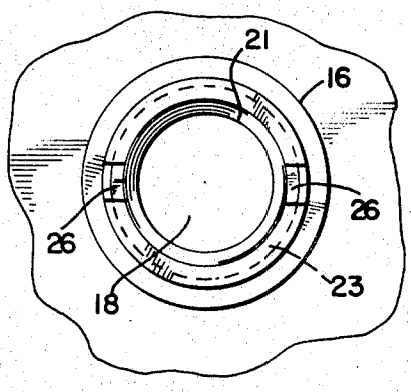


FIG. 4

INVENTOR
CARMEN T. MASCIA
BY Fred P. Kostka
ATT'Y.

SAFETY CLOSURE

The present invention relates to container closures and more particularly to a safety closure requiring a plurality of different motions so that a child is unable to gain access to the container contents.

The safety closure of the present invention is intended to be incorporated on rigid containers such as cans, bottles, jars and the like in which the product contained therein is inherently dangerous and may cause injury if not used with care or in accordance with prescribed directions. Medicines, drugs, cleaning fluid and compounds, and the like all fall within the category of inherently dangerous products. Heretofore, such products when packaged in rigid containers have a closure which is either applied by a force fit or screwed on the opening such that little effort or manipulation is required for a child to open the closure. These prior closures are undesirable for the reason that the child is likely to consume or otherwise mishandle the products with disabling effects. In addition, some products may be explosive when not opened or used in accordance with the direction contained on the exterior of the container. For example, cleaning fluid, lye, or the like must be handled with care and become dangerous when a child has access thereto.

Considerably research has been done in an effort to develop a closure which cannot be manipulated by a child. It has been found through psychological testing that the most effective closure is constructed to require a combination of linear and rotatable movements to open.

By the present invention, it is proposed to provide a closure which is constructed and arranged to require a combination of linear and rotary movement to open the same and thereby to render the closure child proof.

It is still a further object taken in conjunction with the foregoing object to provide a child proof closure which is constructed and arranged to include a plurality of components which must be aligned in a specified position before the motion can be changed from a linear or rotary to open the closure.

It is a further object to provide a child proof closure which is of relatively simple construction and economical to manufacture.

The foregoing and other objects of the invention which will be readily apparent from a reading of the following specification and appended drawings are accomplished generally by a closure member including a tubular neck having a plug snuggly seated in the bore thereof. The plug includes an axially reciprocal operating or actuating member having means which are seatable within notches provided in the upper end of the neck to lock the actuating member of the plug against rotary movement. The plug is provided with pin means which is received in a groove in the bore wall which communicate with the notches in the neck. The pins serve to retain the plug in the neck against vertical displacement therefrom. Upon lifting the actuating member, the plug is released for turning movement so that the pin means is aligned with the notches. Thereafter, the plug is free to be lifted vertically from the bore and removed from the neck.

IN THE DRAWINGS

FIG. 1 is a fragmentary perspective view of a container showing the safety closure of the present invention attached thereto;

FIG. 2 is an exploded perspective view of the container shown in FIG. 1 and showing the closure in the open position;

FIG. 3 is an exploded elevational cross-sectional view of the closure with the components in the opened position; and

FIG. 4 is a top plan view of the closure neck taken generally along the lines 4–4 of FIG. 3.

Referring now to the drawing, the safety closure **10** of the present invention is shown applied to a container **11**. The container **11** comprises generally a tubular body **12** to which there

is attached at one end an end closure **13** having an axial opening **14**. The end closure **12** is attached to the body **12** by means of a double seam in the conventional manner. As shown, the opening **14** is bounded by a curled rim **15** which serves to attach the closure to the container as more fully to be explained hereinafter. While the safety closure **10** of the present invention is shown as a separate assembly attached to a container, it is to be understood that the closure may be made integral or directly formed on a container as for example, a jar, bottle or the like.

The safety closure **10** includes a tubular housing or neck **16** which terminates at its lower end in an outwardly projecting horizontal flange **17**. As shown, the curled rim **15** bounding the opening **14** is suitably wedged or otherwise permanently fastened to the neck flange **17** thereby to retain the neck fixed to the end **13**.

The neck **16** includes a bore **18** having a small or reduced bore section **19** which merges with an inverted frustoconical section **21** providing a plug seat, and a large bore section **22** extending upwardly from the plug seat **21**. Formed in the large bore section **22** intermediate the length thereof is a continuous annular groove **23**. The groove **23** may be horizontal, as shown, or may be slightly inclined so as to force a closure plug **24** into firm seating engagement with the plug seat **21** as more fully to be explained hereinafter. Formed in the upper edge portion of the sleeve **16** are a pair of diametrically opposed opened end notches **26** which intercept and communicate with the groove **23**.

The closure plug **24** is shaped complementary to the bore sections **22** and **21** and is snuggly and tightly received therein. The closure plug **24** is formed as a cup having an interior hollow chamber. Disposed within the chamber **27** are a plurality of chordal extending ribs **28** of which the inner ends are spaced to provide a vertical guide surface **29** for guiding a post **30** of a closure operating or actuating button **31**. Extending diametrically between the inner ends of the ribs **28** and seated within the wall of the plug **24** is **32** having outwardly projecting ends **33**. The outwardly projecting ends **33** extend into the groove **23** and serve to retain the plug seated within the bore **18** and preclude vertical movement of the plug outwardly from the bore **18**. When the plug **24** is turned to that the projecting pin ends **33** align with the diametrically opposed notches **26**, the plug may be lifted vertically and removed from the neck **16**.

The actuating member of button **30** is in the form of a cover or a disc **34** having diametrically opposed outwardly extending ears **35** from the underside of which there project a pair of lugs **36** which are adapted to seat within the notches **26**. The opposed lugs **36** when seated in the neck notches **26** to prevent turning movement of the actuating button relative to the neck **16**. The post **29** depending from the underside of the cover **34** may be formed integral therewith and includes an elongate vertical slot **37** through which the pin **32** extends. The cover member is thus restricted for vertical movement between a lowered position in which the lugs **34** are seatable within the neck notches **26** and an elevated position spaced from the upper end of the neck **16** and the plug **24**.

In the closed position, the closure member components are arranged so that the plug **24** seats within the bore **18** in snug engagement with the frustoconical section seat or plug **21**. In this connection, it is to be noted that the groove **23** may be inclined away from the vertical so that the pin end **32** when turned therein is operative to force the plug **24** downwardly into firm engagement with the valve seat **21**. In this position, the projecting ends **32** of the pin are received within the groove **23** so that the plug may not be removed by vertical lifting movement. Also, the actuating member **31** is in the depressed position with the lugs **36** seated within the notches **26** so that the plug **24** is restrained against turning movement. Note, that the notches and lugs **36** seated in the notches **26** and the pins **33** seated in the groove **23** are displaced about 90° relative to each other.

To open the closure **10**, the actuating member or button **31** is lifted upwardly as shown in FIG. **3** so that the lugs **34** are clear of the notches **26**. The actuating button **37** is then turned and thereby the plug **24** which is secure for turning movement therewith by means of the pin **32** extending through the slot **37**. Turning movements is continued until the projecting pin ends **33** are aligned with the notches **26** communicating with the groove **23**. The plug **24** is then removed by applying a lifting force on the actuating button **31** to pull the pin ends **33** through the notches **26**.

To reclose the closure **10** the plug **27** is initially inserted into the bore **18** and rotated until the projecting pin ends **33** align with the notches **26**. The plug **34** is then depressed downwardly so that the pin ends **33** are received within the groove **23** and turned until the lugs **36** on the underside of the actuating member **31** are in alignment with the notches **26**. Thereafter, the closure **10** is completely closed by depressing the actuating member **31** downwardly to seat the lugs **36** in the notches **26**.

I claim:

1. A closure member comprising a tubular neck having a bore, a circumferential groove formed on the walls of said bore intermediate the length thereof, diametrically opposed notches in the upper end of said neck and communicating with said groove, a closure plug turnable in said neck bore and having diametrically opposed projecting pin means receivable within said groove to prevent upward lifting of said plug from said bore, actuating means for turning and lifting said plug mounted for reciprocation in said plug for linear movement between a depressed position and a raised position, and diametrically lug means on said actuating member angularly displaced from said projecting pin means and being seatable within said notches in said depressed position of said actuating member to prevent turning of said plug and being clear of said notches for turning said plug to align said pin means with said notches whereby said plug may be removed from said bore.

2. The invention as defined in claim **1** wherein said projecting pin means comprises a pin extending diametrically through said bore.

3. The invention as defined in claim **2** wherein said actuating means include a post extending into said plug, said post having an elongate slot, and wherein said pin extends through said elongate slot.

4. The invention as defined in claim **3** wherein said plug is substantially cap shaped, and ribs project into the chamber of said cup and provide vertical guide surfaces for guiding said post.

5. The invention as defined in claim **4** wherein said plug and said bore are formed with complementary frustoconical seating surfaces for said sealing bore.