

[72] Inventor **Edward J. Towns**
53 Mounthaven Drive, Livingston, N.J.
07039
 [21] Appl. No. **791,592**
 [22] Filed **Jan. 16, 1969**
 [45] Patented **Jan. 19, 1971**

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Primary Examiner—George T. Hall
Attorney—Kenyon & Kenyon Reilly Carr & Chapin

[54] **SAFETY CLOSURE FOR CONTAINERS**
6 Claims, 6 Drawing Figs.

[52] U.S. Cl. **215/9,**
215/47; 220/31, 220/42, 220/60

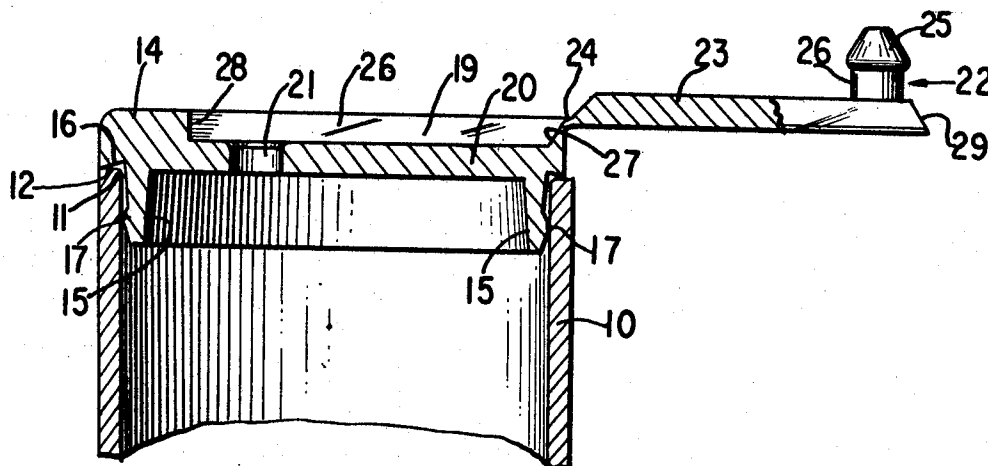
[51] Int. Cl. **H61j1/00,**
B65d 55/02

[50] Field of Search **215/9, 41,**
47; 150/.5; 220/60, 31SR, 42, 29; 222/153, 541,
480

[56] **References Cited**
UNITED STATES PATENTS

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ABSTRACT: A container and a safety closure therefore wherein the container and closure have portions that are interengageable when the closure is mounted on the container neck to make the closure difficult particularly for children to remove and flush fitting flap integral with the closure and resting in a recess in the top of the closure and on a partition at the bottom of the recess which is provided with at least one dispensing opening. The flap has an integral nosed plug or bung to seal the opening in flush flap position, the nose making it difficult to open. The flap may be swung from its flush position on the closure to an open position by the proper user to withdraw the plug or permit the closure to be removed from the container, the dimensions of the closure and the normally flush position of said flap also making it very difficult if not impossible for children to lift the flap of the closure from its flush position, thus providing safe storage for dangerous container contents and preventing unauthorized access thereto.



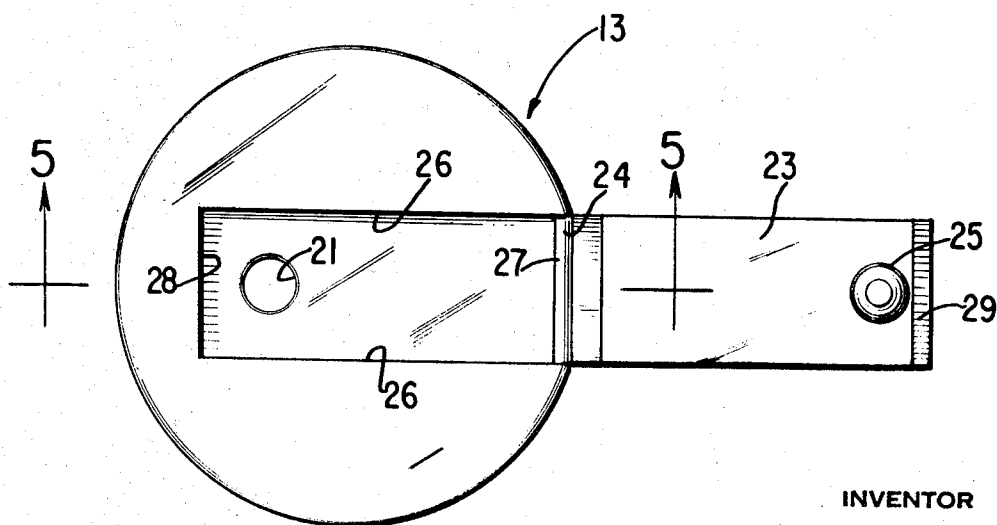
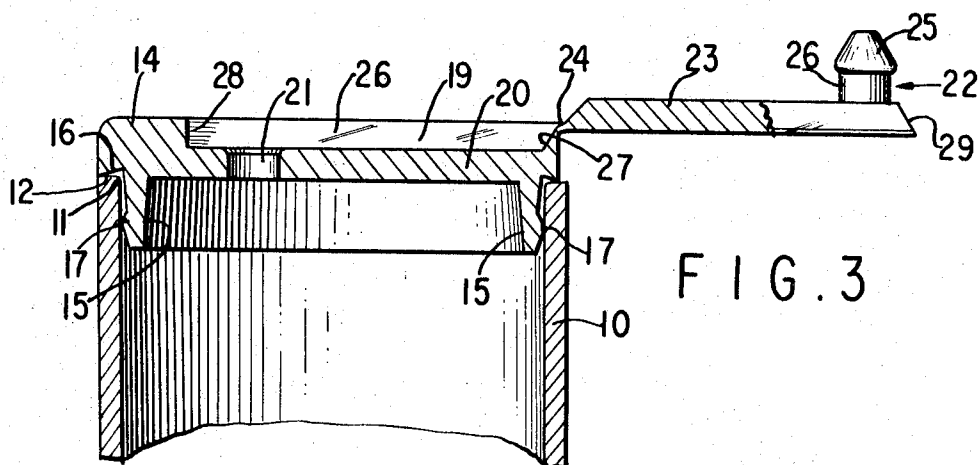
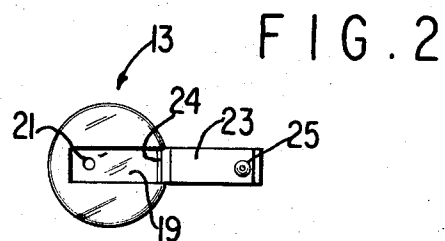
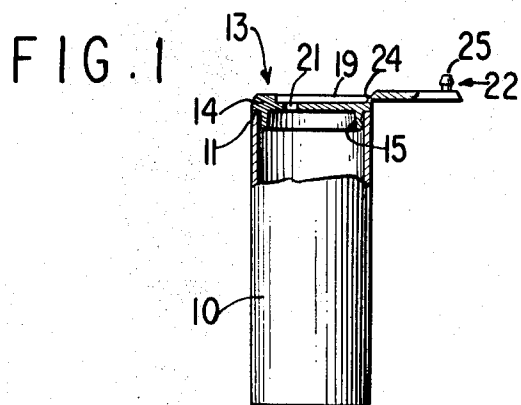


FIG. 4

INVENTOR
EDWARD J. TOWNS
BY *Kenyon & Kenyon*
ATTORNEYS

FIG. 5

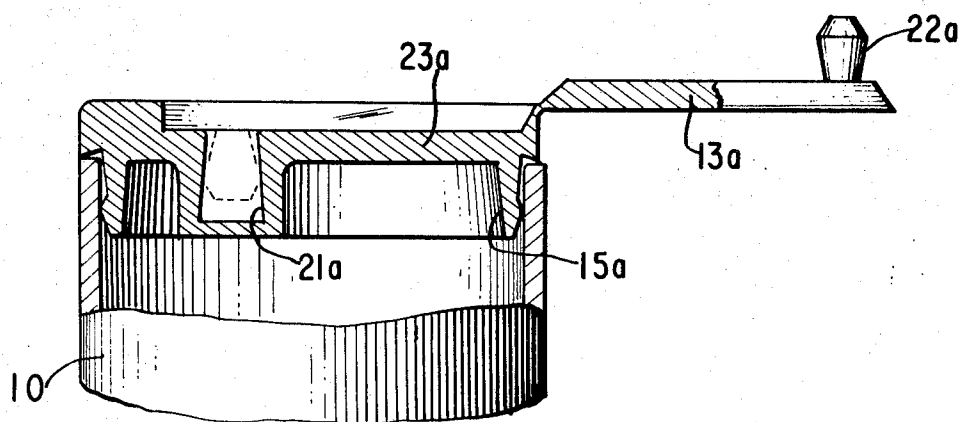
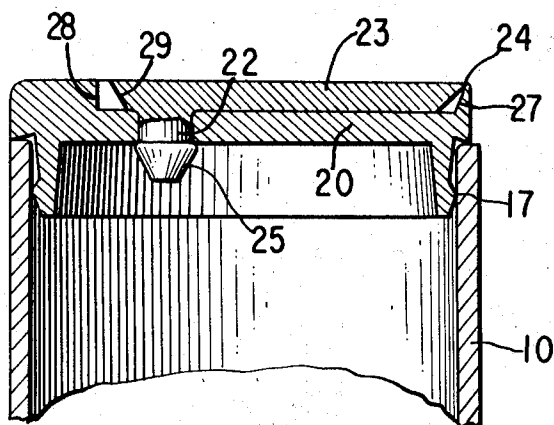


FIG. 6

INVENTOR
EDWARD J. TOWNS
BY *Henry & Henry*
ATTORNEYS

SAFETY CLOSURE FOR CONTAINERS

RELATED APPLICATIONS

A related application Ser. No. 743,685, filed July 10, 1968, (now abandoned) was at one time copending.

BACKGROUND OF INVENTION

Containers and closures therefore which are used for dangerous contents must be of such type that unauthorized opening especially by children can be prevented. Such containers and closures intended to prevent the access to or removal of dangerous contents therefrom by children or accidental removal by others are prevalent but many have not been popularly accepted by the public or producers of such containers for a number of reasons. Among these are complexity of construction and assembly contributing to excessive and impracticably high manufacturing costs, difficulty of manipulation in application and opening of the closure so that only people with a mechanical bent or thoroughly familiar with the structure can use them without annoyance and also because of the relatively short life of the closure.

A further difficulty with a number of known prior art closures of this type is an inability to mass produce them and undesirable overall size of the parts forming the structure.

This invention relates to a safety closure for a container which is of relatively simple construction that is inexpensive to produce on a mass production basis and fully effective for its intended purposes, that can be readily applied to existing containers, making it difficult for children to gain access to dangerous contents but yet permitting simple manipulation by a proper user of the closure for authorized removal of such contents.

Further features and objects of the invention are the provision of improved safety closures for containers of a semitype that may be originally applied as by force fitting or the like onto the container and which closures are either irremovable or very difficult to remove from the container once they have been applied.

Other objects and features of the invention will become apparent from the following detailed description and the accompanying drawings forming a part hereof, wherein:

FIG. 1 is a sectional view of a container and a safety closure mounted thereon embodying the invention and with the closure in open condition;

FIG. 2 is an upper plan view of FIG. 1;

FIG. 3 is a fragmentary sectional view of the container and of closure cap of FIG. 1 on an exaggerated scale showing the closure in open condition for removal from the container;

FIG. 4 is a top plan view of FIG. 3;

FIG. 5 is a sectional view taken along line 5-5 of FIG. 4 illustrating the closed condition of the closure; and

FIG. 6 is a similar sectional view of a modification.

DETAILED DESCRIPTION

Referring to the drawings, the reference character 10 denotes a cylindrical container or receptacle of any suitable material although preferably a moldable synthetic material such as polyethylene polypropylene, copolymers of these materials or other moldable plastic having the characteristics of a solid ethylene polymer that may, if desired be deformed by squeezing so as to eject contents thereof. In the embodiment shown, this container 10 has substantially tubular cylindrical shape with circular cross section and a sidewall of substantially uniform thickness except at the inner wall of the open neck region whereat the wall is rounded at 11. The upper surface 12 of the container about the container neck adjacent the rounded portion 11 is a substantially horizontal surface.

If the container 10 is of moldable material, its above-described components may readily all be formed during the molding process.

A safety closure or cap 13 preferably of the same molded synthetic material or materials as is mentioned in detail below is provided for permanent force fitted mounting as a closure

over the open mouth of container 10 after the latter has been filled. This closure or cap 13 has a diameter in its upper portion equal to that of the outer diameter of the container. The sidewall portion 14 of this cap 13 is reduced in diameter at 15 to define a tube that may be inserted with a force fit into the open neck of the container and is provided further with a somewhat tapered finished annular shoulder edge 16 intended to seat closely on the upper surface 12 preferably with a minimal discernible juncture at the outer rims of the abutting edges of the surfaces 12 and 16. The maximum diameter of this cap in its portion 14 is not greater than the outer diameter of the container 10 at its neck. The tubular portion 15 of the cap or closure 13 is provided with an annular projection 17 nears its end that may be deformed during force fitted mounting of the cap or closure 13 on the container neck so that it holds the closure or cap 13 tightly in place after it has been mounted on the filled container to prevent dislodgements and accidental removal therefrom. At the same time, finished abutting surface 12 and tapered edge 16 of cap 13 are maintained in a close fit and since the maximum diameter of cap 13 is not greater than the diameter of container 10 at its neck, the insertion of a fingernail, knife blade or other prying device at their outer edges to separate the cap or closure and container is in effect prevented. This prevents or makes very difficult the removal of the cap or closure 13 from the container 10 by children or even accidentally by others.

The upper or top wall 18 of the closure or cap 13 is provided with a recess 19 whose bottom defines a transverse partition 20. At least, one opening or perforation 21 is provided in the partition 20 within the confines of the recess 19. This opening 21 is normally closed off as by a stopper or plug 22 which is integral with a flap 23, one of whose edges is integral at 24 with the closure or cap 13 adjacent its top surface. This integral connection at 24 permits hinged movement of flap 23 from flush fitting condition in recess 19 as seen in FIG. 5 to the open condition seen in FIGS. 1 and 3 and vice versa. In closed condition, the plug or stopper 22 which has a nose 25 extends into opening 21 and seals it. The nose 25 passes through the opening 21 and its annular groove 26 fits tightly in said opening, the nose yielding somewhat during entry so as to lock the plug in said opening 21 and force applied in knowledgable manner is required to dislodge it and permit hinged opening of the flap 23.

Authorized opening of the flap 23 of cap 13 from its flush fit in the recess 19 and the closed condition of its plug 22 and nose 25 in the opening 21 is effected by hinged swinging movement of said flap 23. This flap or tab 23 is, as noted, integral along one edge at 24 with said top surface 18 of said closure or cap 13 and normally in closed condition fits closely within the shallow recess 19 which is preferably located in the centralized portion of said top surface 18. This recess 19 is of substantially rectangular shape and has oppositely substantially vertical sidewalls 26 being joined by a tapered end wall 27 and an oppositely located substantially vertical end wall 28. The flap 23 is joined integrally at 24 to the cap 13 at the region adjacent tapered end wall 28 and has an overall contour and thickness complementary in shape and depth to those of the recess 19 being provided also on its under face with the stopperlike projection 22 which with its nose 25 is designed to fit forcibly into and seal off opening 21 when the flap 23 lies flush within the recess 19 as seen in FIG. 5.

The unattached tapered end 29 of flap 23 is slightly spaced from wall 28 when lying within recess 19 to permit insertion of a fingernail or other prying means under the edge of tapered end 29 so that the flap 23 can be swung out of its nested retained position in recess 19 about its hinged joint at 24 with cap 13 at the end wall 27.

The cap 13 is molded preferably by injection molding and the synthetic plastic material thereof which may be polyethylene, polypropylene or copolymers of these materials which in the wall thickness as employed are sufficiently flexible to permit hinged movement of the flap 23 at joint 24 and yet provide sufficient strength to prevent its tearing when

grasped for hinging movement to opening condition or for forcible removal of the cup from the container.

Although cap 13 has been shown as applicable to cylindrical containers 10, it is likewise applicable to containers of different shapes as long as its peripheral contour is of like dimensions and shape as that at the necks of containers to which it is to be applied.

In the modification of FIG. 6, the opening 21 is replaced by a tubular recess 21a which is closed at its bottom and the flap 23a has a tapered projection 22a which in closed condition of the flap fits tightly in recess 21a to hold the flap 23a snugly in place in recess 19a. All other parts bearing like reference characters with added subscripts a correspond to similar parts in FIGS. 1—5.

In all embodiments after a container is filled, the cap 13 or cap 13a with its flap 23 or 23a nested condition is force fitted onto the open neck of the container and becomes substantially irremovable. Thereafter, the container can be opened by prying the flap 23 or 23a into unfolded condition by a fingernail or other prying means, thus pulling out of flap plug 22 or 22a and exposing opening 21 or recess 21a. To reclose the containers, its flap is again simply renested in flush condition. This may be repeated indefinitely as required to permit removal of selected amounts of container contents.

Ordinarily, children will find it difficult to unseat the flap of opening. Likewise, accidental opening will be avoided because of the tight engagement of nose 25 in opening 21 and the attempted user will be required first to manipulate the flap 23 to an unseated condition to expose the aperture 21, thus warning the user in dark or dimly lighted rooms of the dangerous contents of the container. With the flap 23 in its open condition, the cap 13 or 13a can be pulled off the container and the contents spilled out of the container. Thereafter, the cap can be replaced with its flap again swung to closed nested condition.

While specific embodiments of the invention have been disclosed, variations in structural detail within the scope of the appended claims are possible and are contemplated. There is no intention, therefore, of limitation to the abstract or exact disclosure herein presented.

I claim:

1. A container and safety closure means therefor, said container having a neck portion, said safety closure means comprising a one-piece cap having a sidewall, a portion of which is dimensioned to define a tube that fits into the neck said tube having externally projecting means deformable during mount-

ing of the cap in the neck portion of the container and engaging the inner surface of said neck portion to hold the cap tightly in place after mounting and said cap having a tapered annular shoulder adjacent said tube whose peripheral dimensions are substantially the same as those of the upper edge of said neck, said shoulder being adapted to engage the upper edge of said neck in such close disposition as to prevent pried removal of the mounted cap from said container after it has been mounted thereon, a flap portion integral with said cap and swingable hingedly therefrom, and at least one recess in said cap for receiving said flap in flush disposition relative to the top surface of said cap, said recess having at least one aperture and said flap having a plug for such aperture for closing and sealing such aperture and retaining the flap in said flush disposition and said flap being swingable from said flush disposition to an open position to remove such plug from such aperture to enable removal of said cap from said container.

2. A container and safety closure therefor according to claim 1, including nose means on said plug securely engaging in said aperture and holding said flap in said flush disposition in said cap.

3. A safety closure cap for application to a container comprising a tubular portion mountable into a container neck for retention therein and having projecting means for engaging tightly the inner wall of said container to prevent removal of the closure cap from the container once applied thereto and said cap having a recess in its upper surface provided with an opening, flap means integral with an hinged to said cap and normally lying in said recess in flush disposition with the outer top surface of said cap and closing off said opening, said flap being swingable from its flush disposition in said recess into an open position to expose said opening and facilitate removal of the contents from the container.

4. A safety closure cap for a container according to claim 3 including a plug means on said cap for sealing said opening and for retaining said flap in said flush disposition in said cap.

5. A safety closure cap for a container according to claim 4 wherein said plug means includes a nose engageable in said opening to retain said flap in said flush disposition.

6. A container and safety closure therefor according to claim 1 wherein the inner upper edge of said container is rounded and the outer rim of said tapered annular shoulder and outer rim of said container provides a minimal discernible juncture upon seating of said shoulder on the upper surface of the container neck portion when said cap is mounted on said container.

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