March 16, 1965 E. F. GRAY 3,173,565

SAFETY CLOSURE CAPS FOR ASPIRIN AND MEDICAL CONTAINERS

Original Filed Dec. 23, 1957

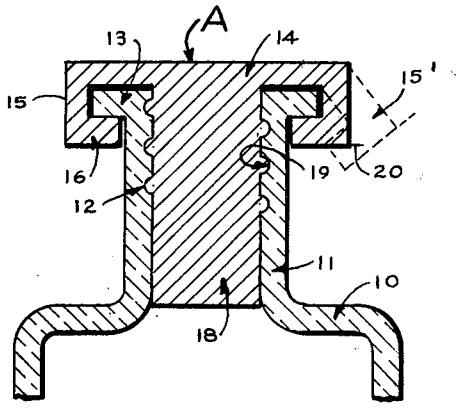


FIG. 1

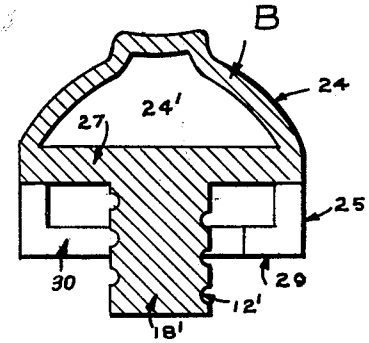


FIG. 2

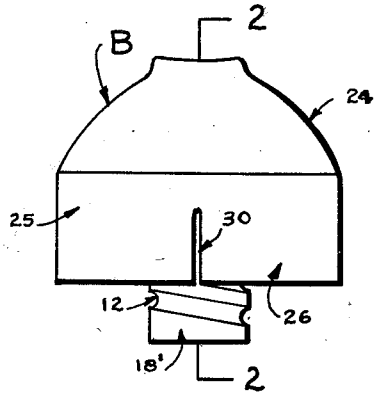


FIG. 3

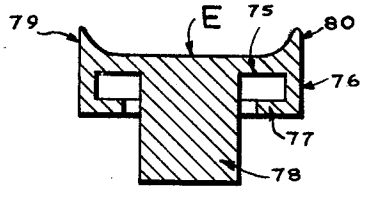


FIG. 5

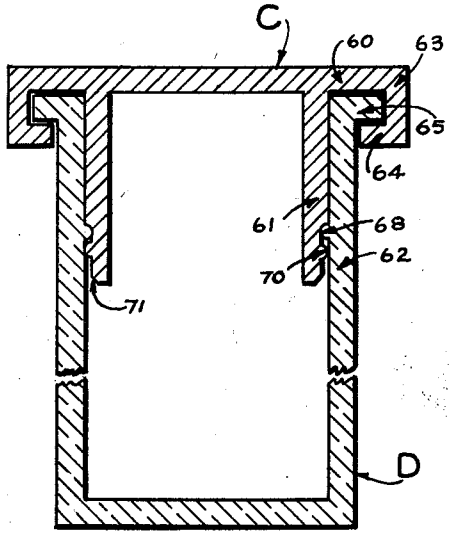


FIG. 4

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SAFETY CLOSURE CAPS FOR ASPIRIN AND MEDICAL CONTAINERS

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Continuation of application Ser. No. 704,495, Dec. 23, 1957. This application Jan. 4, 1963, Ser. No. 254,533
4 Claims. (Cl. 215—9)

This invention relates to an improvement in aspirin and medical or harmful chemical container closures. More particularly the improvement relates to simple safety lock closure caps for preventing the opening of aspirin pill containers and other harmful pill and liquid medicines by small children who are unable to simultaneous coordinate their fingers to two physical cooperative motions necessary to remove the safety caps from the medical containers. This application is a continuation of my application Serial Number 704,495, filed December 23, 1957 (now abandoned).

It is a physical and psychological rarity when a child of five years of age or less can coordinate their fingers to accomplish two simultaneous operations of a character which accomplishes a single objective. This is particularly true with respect to screw caps as usually found on aspirin and other containers for medicines which are dangerous to children. Yet there is no present safety device on such bottles and containers despite the fact that more chidlren die of aspirin poisoning than from polio. Thus, although the need is serious, there appears to have been no answer provided which has reduced or eliminated this problem.

Accordingly it is an object of this improvement to provide medical containers with replaceable safety lock-on closure caps that prevent small children from gaining access to harmful medicines.

Another object of this improvement is to provide aspirin containers and liquid medical bottles with replaceable lock-on safety closure caps having an inner fluid tight container closure in combination with an external locking element that requires dual cooperative and simultaneous finger coordinated movements in different directions to gain access to harmful medical contents.

Further objects and advantages will be apparent from the following description of the accompanying drawings, wherein:

FIG. 1 is a cross sectional and partial view of a medicine bottle or aspirin container with the replaceable safety lock-on closure herein described;

FIG. 2 is a cross sectional view through line 2—2 of FIG. 3 and shows a portion of a modified replaceable safety lock-on closure cap for aspirin bottles and medicine containers;

FIG. 3 is a side-elevational view of the modified replaceable safety lock-on closure cap illustrated by the partial view of FIG. 2;

FIG. 4 is a modified safety lock-on closure cap as applied to a pill bottle; and

FIG. 5 is a cross section of a further modification of the safety lock-on closure cap shown in FIGS. 1, 2 and 4.

With reference to FIGURE 1, there is illustrated the upper portion of an aspirin bottle or medical container **10** having a rounded neck **11** provided with an internal spiral thread **12**. The neck **11** provides an aperture for the container **10** into and over which is adapted to be fitted the safety lock-on closure cap A. The upper end of neck **11** is provided with an outstanding flange-like integral neck ring **13** over which a relatively stiff flange **16** of the lock-on closure cap A is adapted to be locked as hereinafter described.

The safety closure cap A is of a molded slightly flexible plastic which is non-flimsy and with a permanent

structured inturned lock-on locking flange. While the plastic material of the cap is described as being "slightly flexible" it is to be understood that the degree of flexibility intended by this term is such that the cap at all times will substantially maintain its shape as molded even though its degree of flexibility is such as to strongly resist but yieldably permit some slight deformation thereof while being applied onto or removed from the container aperture. Thus, the cap permits only slight side flexing of the wall portion while being removed, as contrasted to a limp rubber skirt which is without any permanent locking structure of an inturned permanent nature and is removed by unrolling or wholly deforming itself while simply being pulled over a container rim. The present structure cannot be removed by simply pulling on the top of the cap as is provided for in such structure as disclosed in Ryan 860,995 or lifting the skirt of Sacks 2,038,858.

For example, the cap A is a slightly flexible but relatively stiff plastic resin formed of such material as polyethylene, vinyl, urethane, semi-hardened polyester, synthetic or hard molded rubber composition and the like capable of bending only slightly along one edge at a time to yieldably slip over one side of the container rim. As indicated, the relatively stiff though flexible non-limp molded plastic cap, of polyethylene or the like, has a rounded top **14**, having a slightly flexible side wall **15**, which bends or flexes slightly to the side as shown at **15'** to permit the flexibly stiff permanent flange **16** to slip over one side of the container rim at a time as it is pulled outwardly by an external finger force pulling perpendicular to the container neck portion. Depending about the center portion of top **14**, as an integral portion thereof, is an elongated circular aperture closure portion **18** providing a relatively large contact surface area with the neck **11** and provided with a spiral screw thread **19** adapted to fit within and turn into the relative cooperative spiral thread **12** of neck **11**. Preferably, the elongated aperture closure portion **18** is a solid body which screws or turns down into the neck **11** in air and fluid sealing relationship therewith. However, for such containers as do not require a fluid tight seal the body closure portion **18** may be made more loose fitting and the securing action of the threads depended upon for holding the closure cap in place in conjunction with the locking flange **16**. The side **15** is adapted to be flexed only to the side by a lateral extension **20**, as illustrated by the dotted lines **15'**, or otherwise forceably lifting flange **16** aside to simultaneously slide over the ring **13** as the aperture closure portion **18** is screwed fully into and out of the aperture in neck **11**. The safety feature in this arrangement is the simultaneously required one-finger movement of forceably lifting the flange **16** from its rigid underlocking relationship with ring **13** and the required simultaneous finger or hand movement at relative right angles to the said one movement for turning and releasing the aperture closure portion **18** from its seated position in the aperture in neck **11**. Children of five and under have been found not to be able to puzzle out how to remove the safety closure cap.

The modified safety closure cap B, as shown in FIGURES 2 and 3, comprises a non-flimsy slightly flexible and relatively stiff plastic cap of polyethylene, rubber, or the like having a rounded top **24** with a pair of independently depending only slightly moveable substantially semi-cylindrical side walls **25** and **26**. The two side walls **25** and **26** are structurally the same and may be illustrated by the one depending side wall **25** with an inturned locking flange **29** thereon as shown in the sectional or partial view of FIGURE 2. The rounded top **24** is preferably a raised flexible portion preferably having a hollow space **24'** above a spacer wall **27** from

which depends a stiffly flexible and elongated threaded stopper 18' with a helical thread 12' adapted to be screwed into the neck of a relatively threaded medical container neck (not shown). The stopper or neck portion 18' is shown as depending from the spacer wall portion 27 which is in spaced relation to the top 24 and permits the top 24 to be flexed to aid in unlocking permanent inturned flange from one or more container closure extensions or rim (not shown). As indicated the permanent inturned flange 29 is capable of being only slightly pulled radially outwardly by the fingers and the stopper portion 18' joined directly to the top 24 as a part thereof, to be axially pulled or turned by the fingers simultaneously with the two cooperable movements, as described.

The stiffly plastic, flexible plastic sidewall 25 provided with the inwardly extended permanent formed inturned locking flange 29 is adapted to fit and lock under one or more medical container neck ring extensions (not shown) but which may be as exemplified by the ring 13 in FIGURE 1. As indicated, the other relatively stiff flexible sidewall 26 has a permanent inturned locking flange edge, not shown. Each sidewall is formed by cuts through opposite sides of the cap in the manner as is represented by the slot 30 shown only on the one side in FIGURE 3. A similar slot (not shown) is provided on the opposite side to provide for allowing slight bending of the stiffly flexible walls and to release their corresponding permanent inturned flanges (not shown), for release from or for positioning in their locking position permanent inturned relationship under a holding rim on a medical container.

To aid in releasing the permanent inturned stiff flange portions, as represented by 16 in FIGURE 1, the top 24 is adapted to be squeezed by the fingers simultaneously while the fingers unlock the permanent inturned flange edge as the center depending neck closure portion 18' is turned or forceably pulled to disengage the threads 12' from a medical container aperture. The threads 12' are also representative of sockets into which a rib or ribs similar to the thread 19, on a container neck portion (not shown), may be flexed slightly to be pulled from or forced simultaneously with a squeezing pressure of the fingers to disengage or unlock either or both permanent inturned flanges, as represented by 16 in FIGURE 1 and 77 in FIGURE 5, in the manner described with respect to 15' shown in FIGURE 1. As indicated, by comparison with FIGURE 1 the relative cooperative threads or rib locking and securing projections may be formed either on the safety cap stopper portion 18' or extend about the inner periphery of a container aperture.

Further, in this arrangement it is necessary to slightly bend only one of the stiffly flexible wall portions, as adult fingers are ordinarily strong enough to simultaneously turn or pull the stopper portion 18' to force the opposite wall to release its correlated flange from locking engagement with a retainer element on a container neck, in the manner as herein described.

There is illustrated in FIGURE 4 a safety closure cap C of molded relatively stiff but flexible plastic material. The cap C is formed of polyethylene, plasticized vinyl or acrylate resinous material, pyroxylin, in rubber and the like having a circular top 60 from which depends a circular inner wall 61 adapted to frictionally slide within the aperture provided by a neck 62 of a medical container D preferably in the manner of a tight fitting cork stopper. In conjunction with the depending slightly flexible wall 63 and permanent inturned locking flange 64, the combined friction resistance requires an applied force simultaneously with a strong finger force (pull) at right angles to the upper simultaneous pull to release but not unroll the permanent inturned flange edge 64 from under an enlargement or the extending flange 65 integrally about the neck 62. While in this arrangement the body of the wall 61 may be a solid form or body, of the character of a cork, and provides a sufficiently complicated dual finger operating arrangement for preventing small and baby fingers from opening a container of dangerous pills or fluid medical material, it is preferred to mold or form the neck 62 of container D with an outstanding ring or lugs 68 and the wall 61 with a safety retaining ring 70 adapted to be forcibly flexed over 68 as the semi-rigid safety closure cap C is pulled from or placed within the aperture provided by neck 62.

For molding and extraction from the mold form, a glass or otherwise non-flexible neck 62, the projection 68 is preferably formed as spaced lugs which permits the container D to be extracted from a mold. The ring 70 can be a bead-like structure which will flex sufficiently of itself or by flexure of wall 61 to be forcibly moved past the projection or projections 68. In addition, the lower end of wall 61 may be provided with a bevelled corner 71 which permits the aperture closure portion 61 to be fitted within a container aperture. Thus, in order to remove a safety closure cap, there is required the simultaneous pulling of the permanent inturned flange 64 over projection 65 with a forcible and firm pulling action to remove the cap C from a container, or an application of simultaneously applied multiple forces in different and almost right angular directions to each other to release the safety closure cap from a medical container. This multiple finger or finger and hand operation is found not to be readily comprehended by small children, as indicated.

With reference to FIGURE 5 there is illustrated a safety closure cap E formed of a molded relatively stiffly flexible plastic body having a rounded top portion 75, with a depending stiffly flexible side wall 76 which is provided with a permanent stiff relatively rigid inturned flange 77 and a depending slightly flexible medical container stopper 78. Molded integral with the body of the top portion 75 and on opposite sides may be the thickened body sections forming projections 79 and 80 which provide finger grips for aid in squeezing and slightly bending the stiffly flexible side 76 to unlock the permanent inturned flange 77 from its engagement under one or more projections about a container neck (not shown), but comparable to the extended ring 13 in FIGURE 1 or the projecting enlargement 65 shown in FIGURE 4. The relatively stiff and only slightly flexible depending side wall 76 may be formed as shown in FIGURE 3 and as described with respect to FIGURE 2, if desired. The stopper portion 78 is adapted to have a tight cork-like fitting action in a medical container aperture and to require force to insert and be withdrawn therefrom. This force, in conjunction with the need for a simultaneous forceful finger operation to engage and pull the stiffly flexible side wall 76 aside, to unhook and release the permanent inturned relatively stiff locking flange 77, requires a multiple hand and finger operation simultaneously applied, as a method and safety measure. The permanent inturned locking flange serves to hook under a container rim locking the cap in place against any normal pull on the top of the cap.

Having thus described my improvement in safety closure caps for aspirin and medical containers in accordance with the patent statutes by endeavoring to set forth the herein described embodiments thereof, I desire to have it understood that changes may be made within the scope of the following claims without departing from the spirit of my improvement.

I claim:

1. In combination, a medical container having an aperture wall opening and a plastic safety closure cap therefor for preventing removal by infantile hands, and requiring strength and coordination of two simultaneously applied finger movements pulling substantially at right angles to each other during the removal of said cap, said container

having a walled neck portion with a projection on the inner wall of said neck portion, a rim on said neck portion, said cap having a center body section depending in relatively permanent tight fitting and frictional engagement with the wall of said aperture during ingress thereinto and egress therefrom, and a projecting ring on the said center body portion in cooperable locking engagement with said inner wall projection, an extended top portion, a depending slightly flexible wall supported by said extended top portion and said flexible wall ending in a slightly flexible inturned locking flange adapted to be flexed along one side into and out of locking engagement while moving over and under said rim on said neck portion simultaneously with the said ingress and egress of said center body section, said center body section extending in a plane within said aperture below the plane of said rim and said depending wall ending in said inturned locking flange supported by said extended top portion.

2. In combination a medical container having an apertured wall opening and a plastic safety closure cap therefor for preventing removal by infantile hands and requiring strength and coordination of two simultaneously applied finger movements substantially at right angles to each other during the removal of said cap, said container having a walled neck portion, a rim on said neck portion, said cap having a center body section depending in relatively frictional engagement with the inner wall of said aperture during ingress thereinto and egress therefrom, an extended top portion, a depending slightly flexible wall supported by said extended top portion, said slightly flexible wall section having a finger operable lever member extending therefrom for flexing said depending wall section and ending in a slightly flexible inturned locking flange adapted to be flexed into and out of locking engagement while moving to slip one side over and under said rim on said neck portion simultaneously with the said ingress and egress of said center body section, said center body section and said internal wall portion of said aperture being provided with cooperable screw and thread means for moving said center section into and out of said aperture simultaneously with the said moving of said locking flange.

3. In combination, a medical container having an elongated opening in a wall thereof and a slightly yieldably flexible plastic safety closure cap therefor, said cap maintaining substantially its shape at all times and constructed and arranged for prevention of its removal from said wall opening by infantile hands, such removal requiring strength and coordination of two simultaneously applied finger movements, pulling substantially at right angles to each other in axial and transverse directions relative to the wall opening during the removal of said cap therefrom,

said container wall opening comprising a round elongated neck portion providing for access to the container interior,

a radially outwardly extending annular rim of appreciable thickness on said neck portion at the outer end thereof,

said cap having a slightly flexible radially outwardly extending annular end portion normally disposed adjacent said rim,

a longitudinally spaced inwardly extending radial flange formed on the end of said cap annular end portion and forming a radially inwardly opening annular channel thereon,

said cap channel end portion being solely of a longitudinal extent and shape to conform to and normally closely embrace said container rim and of such a character as to stiffly but flexibly yield and deformably hook over and engage under said rim when a relatively strong force is applied thereto and when said safety closure cap is in container safety-closing position,

an elongated neck portion integral with said cap outwardly extending annular end portion and depending at one end therefrom and normally disposed in close internal contact with said container neck portion,

the opposite end of said cap depending neck portion within said container opening being disposed in a plane spaced a distance substantially beyond the plane of said radially extending flange to thereby provide a relatively large frictional contact surface area within the container wall opening.

4. A container closure cap adapted for use with a container for harmfully consumable materials and having a necked opening therein with an encircling rim at its outer end, said container cap comprising,

a stiffly flexible plastic body having a top wall portion with a peripherally depending and encircling wall portion thereon,

a relatively stiff flexible radially inwardly extending flange relatively permanently positionally spaced from the outer end of said cap body and integral with said peripherally depending wall portion and forming the lower end thereof,

said flanged end forming with said top and peripheral depending wall portion a locking inwardly facing channel of a size adapted to closely embrace the encircling rim of the necked container opening,

a central elongated plug-like closure portion depending from said top wall portion and adapted to close and seal the container necked-opening,

said elongated plug-like portion being of a length to extend a distance substantially beyond said encircling peripherally depending portion whereby it is adapted to provide a relatively large frictional contact surface area with the internal wall of the container necked-opening,

said inwardly extending stiff flexible flanged end serving as a hook-locking element adapted to be only slightly moved by flexure of said peripheral wall portion as said relatively permanently positionally spaced inwardly extending flange is slid over under relatively high manual pressure and engaged under a container aperture rim in its interlocking relationship therewith simultaneously with the ingress of said center depending plug-like portion relative to closing the container aperture,

said central plug-like portion being adapted to remain in continuously sealed relationship with the container aperture while the said relatively permanently positionally spaced inwardly extending hook-flange end is simultaneously and forcibly pulled out by an external application of relatively large force to unlock and move it over the aperture rim portion and also adapted to maintain a continuous sealing relation with said elongated container aperture for a distance corresponding substantially to its entire elongated length as it is removed endwise from the aperture.

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