

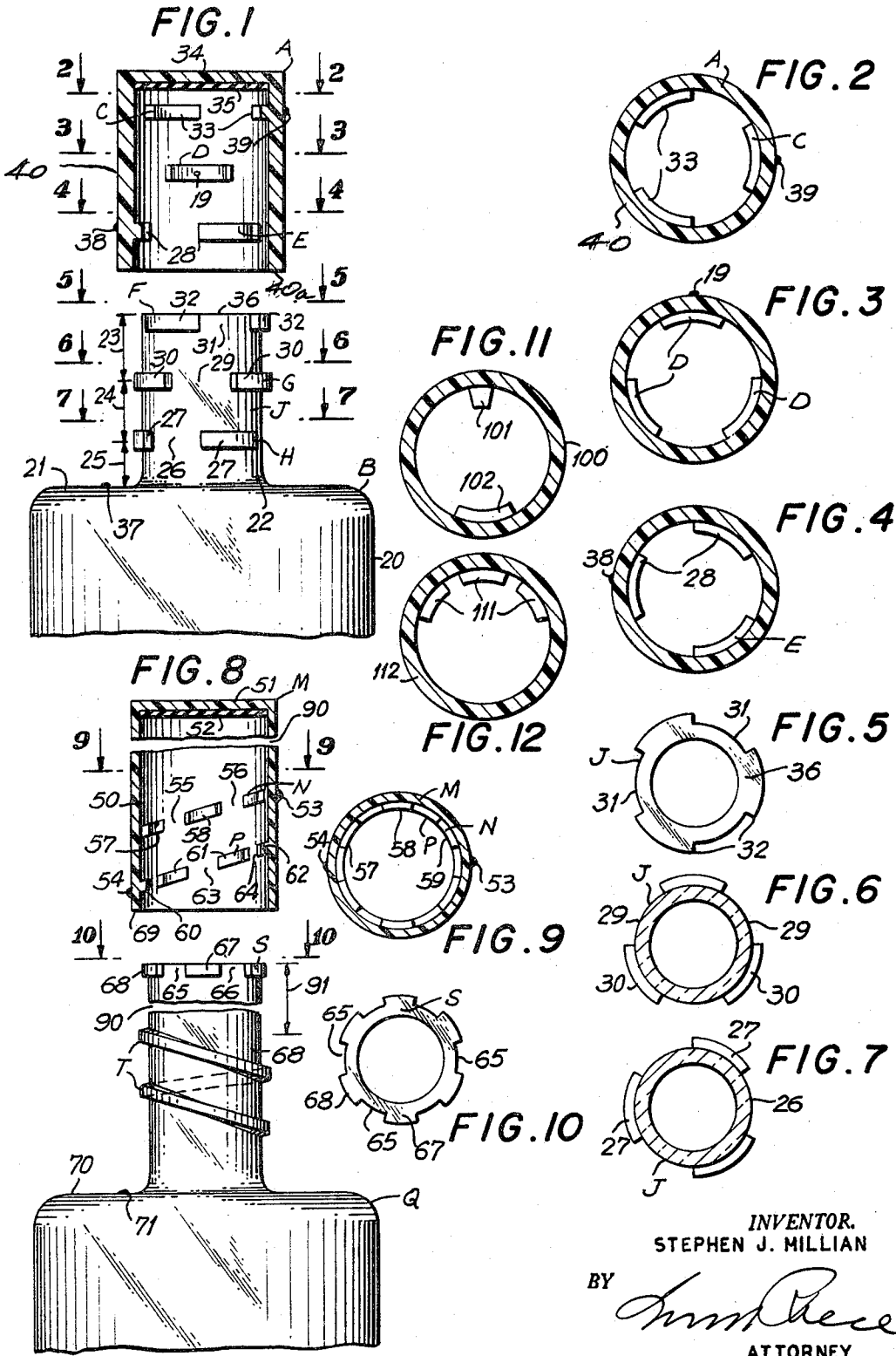
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SAFETY CLOSURE

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ABSTRACT OF THE DISCLOSURE

The disclosure describes a plastic or glass or other container particularly designed to carry medicaments which should be kept out of reach or availability to children. The cap of the container has an internal interrupted screw or separated alignment of projections which will cooperate with a series of peripheral spaced-apart ridges or threads on the exterior of the neck of a bottle or container so that the cap may only be removed by an adult using definite manipulations and may not be removed by a child or minor inadvertently. In this way the pharmaceutical contents, whether they be aspirin or other drugs, are rendered unavailable to children who might be subject to harm if they took them in uncontrolled doses.

Cross-references to related applications

There are no related applications to which cross-reference is to be made.

Background of the invention

(1) *Field of the invention.*—The present invention relates to safety caps or closures particularly for medicinal bottles and containers and phials. The field of invention relates to safety containers or to safety closures for containers, phials, bottles, which may contain drugs, medicines, poisons, pills, and the like, which particularly might be dangerous if children have ready access thereto or where such phials are in a medicine closet and it is desirable to prevent too ready access thereto even by adults who are not fully awake or who are handling bottles in insufficient light.

(2) *Description of the prior art.*—The prior art discloses various types of containers which may be opened by relatively simple manipulation procedures. With screw containers a relatively ready turning of the cap will free the container even though the end of the screw may provide some form of locking means. Bayonet-type-connections generally do not give satisfactory protection since they lend themselves to ready removal. On the other hand, locking devices may render it extremely difficult to replace the cap or even remove the cap, with the result that the phial or container will not be adequately closed after usage or, if safely closed, will not thereafter be accessible because of the difficulty of opening the cap. In no instance can it be considered satisfactory if tools are necessary to permit removal of the cap.

As typical of the prior art reference is made to James L. Powell No. 3,017,047, Jan. 16, 1962; Don A. Haynes No. 3,165,220, Jan. 12, 1965; Gottfried Bugla No. 3,204,800, Sept. 7, 1965; and Lorne A. Caldwell, No. 3,276,612, Oct. 4, 1966. The last-mentioned Caldwell patent requires difficult manipulation both for opening and closing the container and it not only would be impossible for young children to remove the cap, but also adults would have considerable difficulty. The Powell, Haynes and Bugla patents would also permit ready removal of the cap even though some light manipulation is required, since all of these caps depend upon a basic screw or turning motion for application or removal of the cap.

Brief summary or general statement of invention

It is among the objects of the present invention to provide a novel safety closure or cap for glass, plastic or other containers normally positioned in the kitchen or bathroom cabinets which might contain drugs, poisons, pills or medicaments which should not be readily available to children or even to parents or adults who might not be fully awake. These containers should not be merely closed or opened by a simple turning of a screw thread connection or bayonet connection or a press-on frictional connection.

Another object of the present invention is to provide a safety or antiremoval cap or closure which will not be too complicated in usage for an adult but, at the same time, will require sufficient skill as would not be readily available in a young child and which would protect the contents against inadvertent usage without supervision by minors or children.

Another object of the present invention is to provide a simple readily manufactured and applied safety closure cap which may be manufactured by automatic machinery and then readily applied by such automatic machinery without manual intervention and which will adequately cover the top of the medicament or pharmaceutical container or bottle to prevent inadvertent opening or removal of the cap or closure.

Still further objects and advantages will appear in the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration and explanation only and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

In accomplishing the above objects, it has been found most satisfactory, according to one embodiment of the present invention, to provide a plastic or glass container or bottle, desirably of the upwardly projecting or protruding neck type, having a plurality of spaced projecting ridges around said neck which has a cylindrical shape. These ridges may have cut-outs at pre-determined locations around the diameter of the neck, desirably offset from each other and the interior of the cap desirably has corresponding projections similarly spaced which require the cap to be applied in a certain position and then turned through an angular distance of 30°, 60° or 90° before the next ridge openings present themselves, following which there may be another manipulation required to assure that the cap will finally be pressed home. Guide indications may be placed on the side of the bottle and the outside of the cap to indicate the initial and intermediate positions to which the cap is to be turned to permit closure.

It may also be desired to assure airtight and liquid-tight connection and this may be accomplished by adding a screw thread to engage the projections on the inside of the cap and assure firm and final seating of the cap upon the neck of the bottle. These screw threads are desirably of a square thread variety and may be used in conjunction with one, two or three interrupted peripheral ridges and, if desired, between the ridges and below the ridges.

Brief description of the drawings

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described, and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:

FIG. 1 is a side elevational view, partly in section, showing the cap above the container and illustrating one form of the invention where the locking ridges are all circular and not the screw type.

FIGS. 2, 3, 4, 5, 6 and 7 are respectively transverse horizontal sections upon the lines 2—2, 3—3, 4—4, 5—5, 6—6 and 7—7 of FIG. 1.

FIG. 8 is a side elevational view, partly in section and similar to FIG. 1, of an alternative form of the invention, showing both circular ridges and spiral or screw connections.

FIGS. 9 and 10 are respectively transverse horizontal sections upon the lines 9—9 and 10—10 of FIG. 8.

FIGS. 11 and 12 are cross-sections similar to FIGS. 2 and 7 and 9 and 10, showing an alternative embodiment.

Description of the preferred embodiments

Referring to FIG. 1 and FIGS. 2 to 7, there is shown a cap A and a container B. The cap A has interrupted internally projecting members C, D and E, whereas the container B has the interrupted circular peripheral ridges F, G and H on the neck or mouth J.

The cap A and the container B may be of plastic or glass and they may be opaque or transparent, as desired. Plastics are preferred for the cap A and container B and for ridged containers methacrylate and styrene plastics are preferred whereas with flexible caps and containers oriented polyethylene and polypropylene are preferred.

The bottle desirably has a body 20 with a shoulder 21 through which neck J extends upwardly at the junction 22. The interrupted ridges F, G and H are spaced apart by distances 23 and 24 which may be decreasing downwardly but are desirably of the same spacing as indicated. The lowermost ridge H should be spaced about half the distance of 23 and 24 above the shoulder or base stop 21 as indicated at 25.

The sides of the ridge are desirably cut away as indicated at 26, leaving projecting portion 27. Normally these recesses 26 will correspond to the inward projections 28 of the internal interrupted ridge E in the cap. The intermediate ridge G is desirably provided with a cutout indicated at 29, leaving the projecting portions 30. The cutout 29 will desirably correspond to the projection D on the interior of the cap A midway between the projections C and E. The top ridge F may have the cutouts 31 leaving the projecting portions 32.

The cutout 31 will correspond to the inwardly projecting portions 33. The interior or base 34 of the cap A may have a gasket 35 to enable a tight fit on to the top face 36 of the neck J.

On the shoulder 21 there will be an indicator 37. This indicator 37 may be matched appropriately with the indicators 38 and 39 on the sides of the cap A. The indicators 19, 37, 38 and 39 may be projections or colored markings on the shoulder 21 and on the outside face of the cap A. They may also consist of metal or other projecting portions fastened on to the exterior of the bottle B or the cap A.

In application the cap A is first positioned so that the indicator 38 on the lower end of the cap A will match the position of the indicator 37 on the shoulder 21 of the bottle B. This will permit the projecting members 28 to pass through the recesses 31 until they strike the ridge 30. Then the cap A is turned so that the indicator 19 which is on the outside of the cap A 90° from the indicator 37, halfway up the side of the outside of the cap will match the indicator 37. This will permit the projections E to pass through the recesses 29 on the ridge G until the projections 28 strike the ring or projections H. At the same time projection D will pass through the recesses 31.

Then the cap A is again turned 90° so that the indicator 39 matches the indicator 37. At this point the projec-

tions 28 will pass through the recesses 26, while the projections D and 33 will pass through the recesses 29 and 31.

When this is completed the cap A will be securely on the top of the bottle B with the edge 40a against the shoulder 21 and the projections in each ring C, D and E below the projections in the rings F, G and H respectively.

In removal a reverse operation is necessary. The projections on the rings E, D and C will pass through the recesses in the rings, H, G and F by successively turning the cap A so that the indicators or projections 38, 19 and 39 will match the projection 37 during each operation. Each time the cap will be lifted a short distance until the rings are in contact and then it will be turned another 90° until the projections again have been placed in such a position that they may pass through the recesses in the next ring.

Suitable printed information may be placed upon the exterior of the cap or bottle or both, showing how this procedure may be simply carried out.

This device permits the opening and closing of a container by an adult with relatively simple movements but, at the same time, there is very little chance that a child or minor will inadvertently or accidentally open the cap if it is securely closed.

Referring to FIG. 8, the cap M has the internal interrupted oblique ridges N and P, whereas the bottle Q has a neck with a top peripherally interrupted lip S and the low threads T.

The cap M has a circular skirt 50 and a top portion 51 with an interior gasket 52. On the outside of the skirt are the indicator markings 53 and 54 shown as 180° apart. It is, of course, obvious that they can be at other angles of separation. The upper spiral ridge N has the gaps 55 and 56 and the projections 57, 58 and 59. The lower spiral ridge P has projections 60, 61 and 62 and the gap 63 and 64.

The upper ring or projecting lip S has the recesses 65 and 66 and the projections 67 and 68 which match the projections and recesses 55 to 64 respectively depending upon the position of the indicators 53 and 54. There is a large area under the ridge S indicated at 68 which will permit lowering of the cap after the recesses and projections have been keyed through the ring S.

At this point the interrupted oblique ridges N and P may be engaged with the screw threads T and the cap M may then be screwed home until its lower edge 69 contacts the shoulder or base stop 70 of the bottle Q. The indicator 71 on the shoulder 70 may match either indicator 54 or indicator 53.

In operation the indicators 54 and 71 are lined up to permit the lower recesses and projections 60 to 64 to pass through the ring S and then the cap is turned 180° until there is alignment between indicators 53 and 71.

This will permit the upper oblique recesses and projections 55 and 59 to pass through the ridge S. Both ridges N and P will then be in the area 68 and they may be engaged by the screw thread T to clamp the lower edge 69 against the shoulder 70.

As indicated by the break lines at 90, the distance 91 between the top of the thread T and the top of the mouth of the bottle Q will be such as to permit a free movement or turning of the cap M when screw threads N, P and T are disengaged. The distance 91 corresponds to a free space in the cap M and it may be varied so as to provide a loose spinning intermediate position for the cap M.

Referring to the alternative embodiments of FIGS. 11 and 12, the cap 100 may have opposite projections in the same ring as indicated at 101-102, which are not only of different arcuate length, but also may project inwardly a greater distance. As indicated, the projection 101 in the same ring projects a greater distance than the projection 102 in the same ring but, at the same time, it has a shorter arcuate distance. If desired, the difference

in depth and width may be applied to different rings at different elevations.

In FIG. 12 is illustrated an alternative embodiment in which the projections are positioned in groups, leaving one side of the cap devoid of ridges or projections: for example, in FIG. 12 the cap 110 has a ring with projections 111, with no projection in the space 112. This may be repeated in the other rings on both the cap and spout or mouth of the bottle.

The safety closure of this invention, although simple to manipulate for an adult or parent, would prove insuperable for a minor or infant.

The safety closure, as well as the container, may be constructed of a variety of materials, such as glass, plastic and light metal, to hold suitable pills and medicaments without accessibility to infants and young children.

On the inner surface of the cap, the one or more non-continuous or interrupted threads may have the same pitch as the container threads, and each thread or ridge may have two or more individual segments, of different sizes, that may slip through the matched slots of a flange located at the uppermost neck portion of the container.

The individual segments of each cap may have the same sequence and the differences between these segments are constant or so proportioned as to match the flange slots.

The amount of displacement for matching purposes may be 45°, 90°, 120° or 180°.

Having now particularly described and ascertained the nature of the invention, and in what manner the same is to be performed, what is claimed is:

1. A safety closure system to prevent children, infants and minors from too ready access to bottles and containers of drugs, medicaments and pharmaceuticals, comprising a container with an upstanding cylindrical circular mouth serving as an inlet and an outlet, said mouth having at its upper end ridge means consisting of peripheral outstanding interrupted projections with interrupted recesses therebetween and a spiral continuous peripheral uninterrupted oblique circular ridge means spaced substantially below the interrupted projections with a free space intervening between the projections and

the spiral ridge and also having a base stop shoulder and a cylindrical cap closure fitting over and telescoping upon the mouth and having an interior diameter substantially greater than the exterior diameter of the mouth and having a top base and a depending skirt, and inwardly projecting interrupted oblique spiral ridge means with successive recesses and projections on the interior face of the skirt, said interrupted recesses being of a size to permit passage of said skirt projections and said interrupted projections being of a size to pass through said skirt recesses when coinciding with one another, permitting placement and telescoping of the cap upon the mouth when the cap is rotated to a predetermined position and afterwards locking the cap in position when the cap in telescoped position is rotated from said predetermined position, said spiral circular ridge means on said mouth and on said cap enabling the cap to be tightened in position against said base stop shoulder.

2. The safety closure system of claim 1, said peripheral interrupted ridge means on said mouth being in one plane and being positioned at the upper edge of said mouth.

3. The safety closure system of claim 1, said uninterrupted oblique means and said interrupted oblique means being positioned substantially below the top of the circular mouth and below the top of the cap closure, respectively, so as to leave a free space above the uninterrupted oblique means within which said cap may be turned freely after engagement with said cylindrical mouth.

4. The safety closure system of claim 1, said oblique means on the cap being positioned substantially below and spaced from the top of the cap.

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