May 8, 1962 C. J. SAUBER 3,033,406

CONTAINER CLOSURE

Filed Sept. 28, 1960

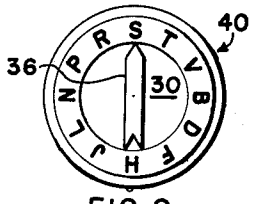


FIG. 2

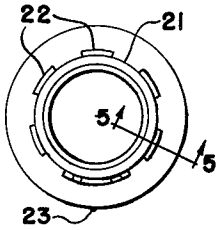


FIG. 4

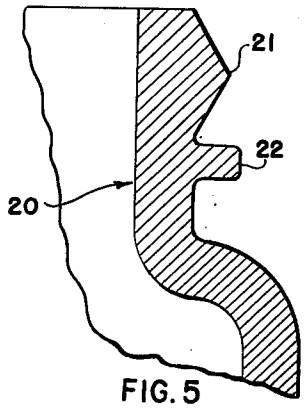


FIG. 5

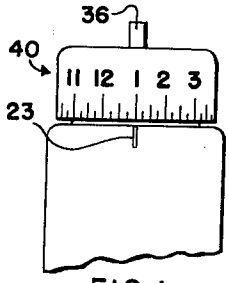


FIG. 1

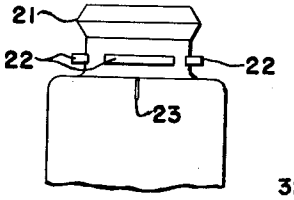


FIG. 3

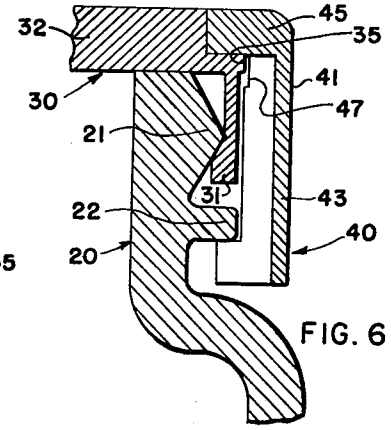


FIG. 6

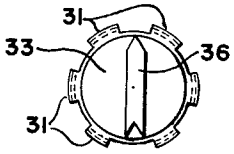


FIG. 8

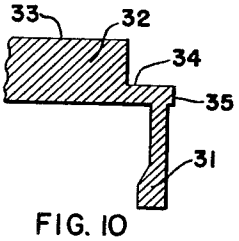


FIG. 10

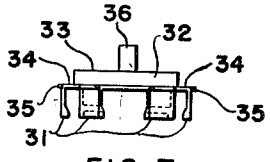


FIG. 7

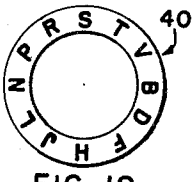


FIG. 12

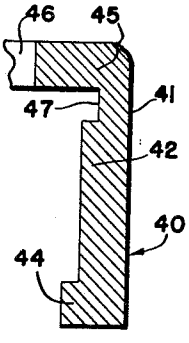


FIG. 14

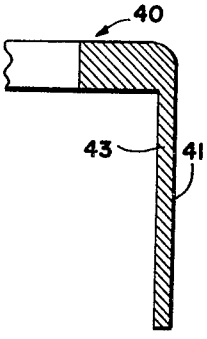


FIG. 15

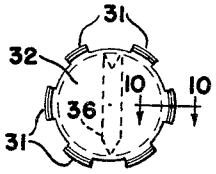


FIG. 9

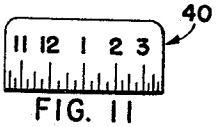


FIG. 11

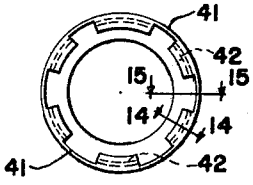


FIG. 13

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3,033,406

Patented May 8, 1962

3,033,406

CONTAINER CLOSURE

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Filed Sept. 28, 1960, Ser. No. 59,027
8 Claims. (Cl. 215—9)

This invention relates in general to closures, stoppers or caps such as for vials, bottles, containers and the like, and more specifically to indexing caps requiring a given combination or indexing arrangement before the cap is removable from the container or the like to which attached.

A device of this character is in great need to prevent, for example, accidental opening and consumption of contents by children or those mentally retarded or feeble. Stoppers or caps such as are the subject of this invention are particularly useful, for medicine vials such as are provided by apothecaries in the dispensing of prescription drugs. Moreover, vial caps according to this invention and containers to receive such caps are simply constructed of such materials as plastic, easily assembled, and relatively inexpensive.

It is accordingly the principal object of this invention to provide a bottle, vial or other container cap which requires a special indexing arrangement or combination of elements in order to open same.

It is another object of this invention to provide a container and cap which will require a multiple combination to place the cap in releasable condition and yet require a final application of pressure before the container is opened, thus providing up to triple safeguards or more.

These and other objects and advantages will become more apparent as the following description proceeds taken in conjunction with the accompanying drawings in which:

FIG. 1 is an elevation of a container with a complete indexing cap according to this invention in place;

FIG. 2 is a top plan view of FIG. 1;

FIG. 3 is an elevation of a bottle or container, the neck of which is adapted to receive the cap illustrated in FIGS. 1 and 2;

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

FIG. 5 is an enlarged section of the container neck along lines 5—5 of FIG. 4;

FIG. 6 is an enlarged section of the container top of FIG. 5 with the assembled indexing cap in place;

FIG. 7 is an elevation of an indexing liner insert for the cap of FIGS. 1 and 2;

FIGS. 8 and 9 are top and bottom plan views respectively of FIG. 7;

FIG. 10 is a section along lines 10—10 of FIG. 9;

FIG. 11 is an elevation of a portion of the indexing cap;

FIGS. 12 and 13 are respectively top and bottom plan views of FIG. 11; and

FIGS. 14 and 15 are sections respectively along lines 14—14 and 15—15 of FIG. 13.

Referring now more particularly to FIGS. 3–6 of the drawings, the numeral 20 refers to the generally circular neck portion of any vial, bottle or container, the outer wall of which is provided with two sets of annular projections 21 and 22 respectively, preferably dissimilar in shape, and an indexing marker 23. The upper annular neck projection 21 is preferably angular and continuous with respect to the neck and adapted to engage on its underside a cap liner 30 (FIGS. 7–11) consisting of a corresponding angular set of fingers 31 depending from the periphery of imperforate circular plate or top 32 provided on its upper surface 33 at its periphery with a continuous shoulder 34 below which extends circumferentially a small annular projection 35. Diametrally across its top surface 33 is a raised element 36 in the form of an indicator or pointed arrow suitable for gripping between thumb and forefinger for rotation to a preselected position.

The lower set of annular projections 22 is in the form of spaced radially extending segments projecting from the bottle neck 20 below the continuous annular projection 21.

Disposed about the cap liner described above is a cap shell 40 (FIGS. 11–15) provided with a preferably cylindrical side wall 41 of alternately varying thicknesses 42 and 43 respectively, defining a plurality of recessed chambers within the inner side wall of the cap shell 40. The thicker portions 42 are provided at their lower ends with an inturned lower lip 44 while the thinner portions 43 are not so provided. The upper portion of the cylindrical cap side wall 41 of varying thickness is provided with a continuously inturned lip 45 defining a central annular top opening 46. Beneath this lip and within the thicker wall portions 42 is provided an annular recess 47. The outer surface of the continuous upper lip 45 may be provided with spaced indicia, letters of the alphabet for example (FIG. 12), while the outer side wall may be provided with additional preferably different indicia, numerals for example (FIG. 11).

The liner top plate 32 is so dimensioned that its shoulder seats snugly but rotatably within the annular opening 46 of the inturned continuous top lip 45 of the cylindrical cap shell 40, while the outside diameter of the cylindrical plane defined by fingers 31 of the liner likewise snugly but rotatably clear the inside diameter of the thicker cap shell portions 42. Moreover, the slightly oversize continuous annular projection 35 extending about the base of the shoulder 34 of the liner insert is adapted to be press fit into the discontinuous annular recess 47 within the thicker portions 42 of the cap shell 40 and immediately below its upper inturned annular lip 45. Thus complete cap assemblies such as seen in section in FIG. 6 may be assembled simply by press fitting a cap liner 30 into a cap shell 40 until the projection 35 snaps in place in the recess 47, thus preventing the liner from thereafter falling out of the assembled indexing cap while permitting relative rotation between the liner 30 and cap shell 40.

It will be recognized that the inturned bottom lips 44 of the inner wall 42 of the cap shell 40 and the projections 22 on the neck 20 of the container form a mating bayonet-type connection which may be engaged or disengaged by merely rotating the cap shell 40 until a proper numeral is in register with the index marker 23 on the bottle or container. Likewise, the cap liner 30 may be rotated relative to the cap shell 40 by raised indicator element 36 until a given letter of the alphabet is in register with the pointer, at which juncture the liner fingers 31 will be adjacent the lesser thickness portions 43 of the cap shell 40, defining with portions 42 recessed chambers sized to receive the outwardly movable fingers 31 when in register. The container cap is now readily disengageable from the container by slight upward pressure springing the fingers 31 of the cap liner 30 outwardly into the recesses or areas of lesser material thickness 43 in the walls of the cap shell 40, permitting the angular bottoms of fingers 31 to clear the correspondingly angular and continuously annular projection 21 on the neck 20 of the container.

It will be observed therefore that a combination of up to three or more items of knowledge are required to open a container having an indexing cap according to this invention, namely, the proper reference character or numeral of rotation of the cap shell 40, the proper reference character or letter of rotation for indexing the liner indicator, and a final safety factor of then having to exert longitudinally or axially an upward pressure to overcome the frictional engagement or grip of the fin-

gers 31 on the upper angular annular projection 21 of the bottle neck 20. Thus there is provided an indexing cap for medicine vials, for example, that will thwart opening by the craftiest infant or youngster, while readily yielding to the parent or other adult attendant having knowledge of the combination required to open the bottle. It is moreover suggested that an endless variety of combinations can be provided by correspondingly varying the spacing of the fingers 31 of the cap liners 30 and corresponding recessed chambers provided by cap shell wall portions 43 of lesser thickness, while yet retaining the final and third safety factor inherent in the last upward axially applied pressure required to ultimately free the cap from the bottle. It is further suggested that the relationship of letter to numeral combination might be related to a patient's initial or nickname, "B" for "Bobby" for example, while the numeral might be related to dosage or time, the numeral "1" perhaps meaning "1 pill per hour," etc.

Having thus described the invention in detail, it will be apparent that numerous other modifications will become apparent to those skilled in the art, and all such as do not depart from the spirit of this invention are intended as falling within its scope as best defined in the appended claims wherein is claimed:

1. The combination with a container provided with spaced lugs forming one element of a bayonet connection, of a closure comprising a cap member provided with a corresponding set of spaced lugs forming the other element of said bayonet connection, a liner member positioned within said cap member adapted for frictional engagement with said container, and means associated with said cap and linear members operative in response to longitudinal pressure exerted on said cap member only after said elements of the bayonet connection have been disengaged for overcoming the frictional engagement of said liner member with the container permitting removal of said closure from the container.

2. The combination with a container provided with spaced lugs forming one element of a bayonet connection, of a closure comprising a cap member provided with a corresponding set of spaced lugs forming the other element of said bayonet connection, a liner member positioned movably within said cap member adapted for frictional engagement with said container, and means associated with said cap and liner members operative in response to longitudinal pressure exerted on said cap member only after said elements of the bayonet connection have been disengaged for overcoming the frictional engagement of said liner member with the container permitting removal of said closure from the container, said cap and liner members being relatively rotatable.

3. The combination with a container provided with spaced lugs forming one element of a bayonet connection, of a closure comprising a cap member provided with a corresponding set of spaced lugs forming the other element of said bayonet connection, a continuous annular projection on said container adjacent said spaced lugs, a liner member comprising a plurality of spaced movable fingers mounted within said cap member, said fingers being in frictional engagement with and below said continuous annular projection, said cap member being provided with an equal plurality of recessed chambers within its side wall capable of register with said plurality of spaced fingers, said cap and liner members being relatively rotatable, the closure being removable

from said container upon application of longitudinal pressure on said cap member only after said fingers and recessed chambers are in register and said elements of the bayonet connection have been disengaged so that the fingers may move outwardly into the recessed chambers sufficiently to clear said continuous annular projection.

4. The combination of a container and closure claimed in claim 3, in which said cap member is rotatable relative to said container and indicia means are provided for indexing said fingers into register with said recessed chambers and for indexing said cap member into position where the elements of said bayonet connection have been disengaged by relative rotation of the cap and liner members and of the cap member and container respectively.

5. The combination of a container and closure claimed in claim 3, in which the cap member is provided with an upper opening and said liner member with a plate from which said fingers depend, rotatably closing said opening in the cap member, and an element extending upwardly above said plate through said opening by which said liner member may be rotated relative to said cap member.

6. A closure comprising a cap member adapted for bayonet-like connection to a container provided with an annularly projecting surface, a liner member relatively rotatably nested within said cap member, said liner member including at least one circumferentially disposed flexible finger in frictional engagement with said annularly projecting container surface, and at least one recessed chamber within said cap member capable of register with said flexible finger, said closure being conditioned for removal from said container when said bayonet-like connection is in non-engaging register and when said finger is in register with said recess subject to longitudinal pressure being exerted on said cap member for causing said finger to be urged outwardly by said annularly projecting container surface into said recessed chamber.

7. A closure comprising a cap member adapted for bayonet-like connection to a container provided with an annularly projecting surface, a liner member relatively rotatably nested within said cap member, said liner member including a plurality of circumferentially disposed flexible fingers in frictional engagement with said annularly projecting container surface, and a plurality of recessed chambers within said cap member capable of register with said flexible fingers, said closure being conditioned for removal from said container when said bayonet-like connection is in non-engaging register and when said fingers are in register with said recesses subject to longitudinal pressure being exerted on said cap member for causing said fingers to be urged outwardly by said annularly projecting container surface into said recessed chambers.

8. A closure as claimed in claim 7, including indicia means for indexing said fingers in register with said recessed chambers and also for indexing said cap member to the position where said bayonet connection with the container has been disengaged.

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