July 2, 1968 G. SZEKELY 3,390,799

SECURITY-CAPPED CONTAINERS

Filed April 7, 1967

FIG.3

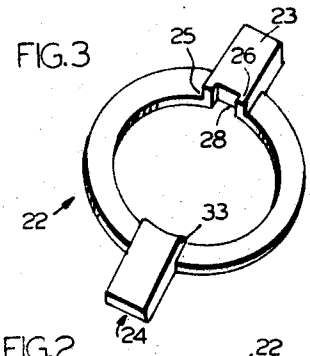


FIG.2

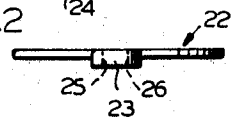


FIG.1

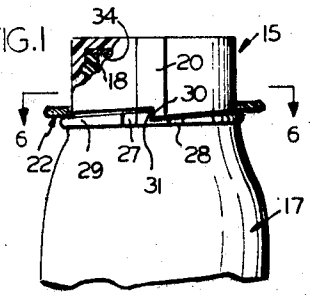


FIG.5

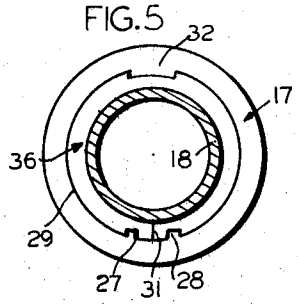
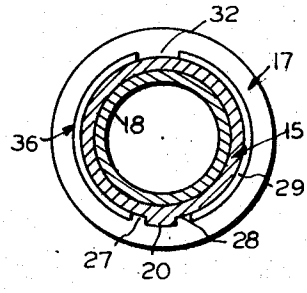


FIG.6



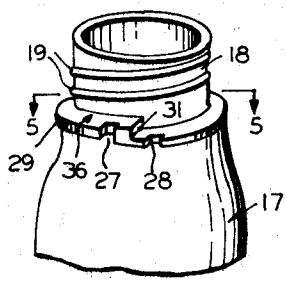


FIG.4

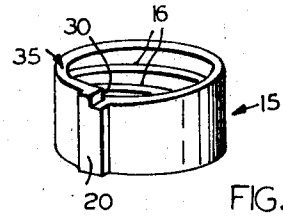
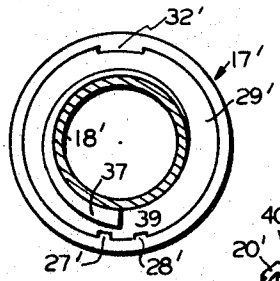
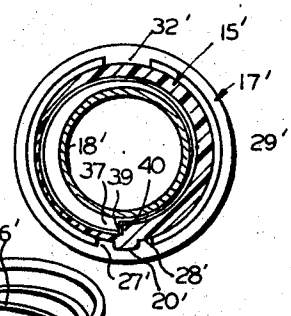


FIG.7

FIG.11

FIG.10





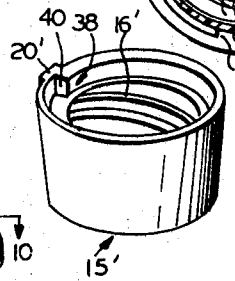


FIG.12

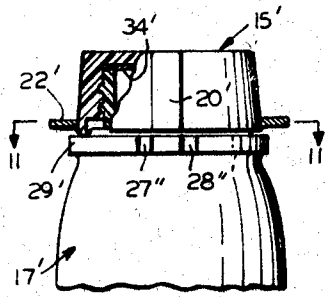


FIG.8

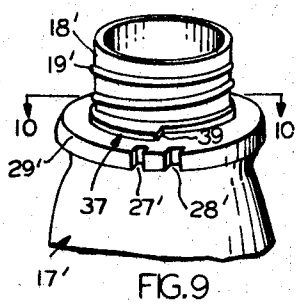


FIG.9

INVENTOR,
GEORGE SZEKELY,
BY

ATTORNEY.

United States Patent Office

3,390,799

Patented July 2, 1968

3,390,799

SECURITY-CAPPED CONTAINERS

George Szekely, 3123 Bailey Ave.,
Bronx, N.Y. 10463

Filed Apr. 7, 1967, Ser. No. 629,185
8 Claims. (Cl. 215—9)

ABSTRACT OF THE DISCLOSURE

The container is closed by a cap screwed onto its neck by use of a spanner until a stop on the cap is in forceful contact with a stop on the container, whereupon a required degree of tightness is attained, which can be verified when a protuberance on the spanner can enter a notch in the container body by a downward sliding movement of the spanner, and when so entered, the cap is locked to the container. The stops serve to avoid overturning of the cap by a force which would make it beyond the capability of an adult of normal strength to unscrew even with the spanner. Each of these stops is the face of the tooth of a one-tooth ratchet formation, which construction offers the stops tremendous strength to withstand the stresses they might be subject to.

The present invention relates to containers such as bottles, cans and the like, fitted with screw-on caps as their closure means, and more particularly to the type commonly called safety bottles or security-capped containers, especially for pharmaceutical and chemical preparations which may be pills, capsules, powders or liquids.

The principal object of this invention is to provide novel and improved security-capped containers of the kind mentioned, the caps of which require the strength of an adult to remove, thus keeping dangerous and harmful substances non-accessible to young children. In fact, even for an adult, a necessary tool is provided in this invention, to loosen the cap, and he also needs it to properly tighten the cap to a required degree of tightness.

A further object thereof, is to provide that when the cap is screwed on the bottle or other container, the tool which is a spanner, also serves to indicate whether required tightness has been attained, by using it as a gage in the manner of "go" and "no-go." This is necessary because what one person calls "tight" may be insufficient to attain the required degree of tightness.

Another object thereof is to provide that at a rest position of the spanner on the cap, the cap will be locked to the container.

Devices of this kind heretofore attempted by others, have failed to satisfy the requirements of the pharmaceutical, chemical and packaging industries, as to effectiveness, or because of objections to their complexity, their cost of manufacture, their inability to be filled by existing equipment or their non-adaptability to standard containers. Construction for security-capped containers which avoids such faults, is the subject of my pending patent application filed February 7, 1967, under Serial No. 614,433 which includes certain protuberances on the cap and on the container to serve as stops. The present invention is an improvement thereover, and another object of this invention is to provide protuberance structure of great strength as stops, so they can withstand tremendous stress, in order that the structure comprising the gaging means shall never be subject to stress.

Still a further object of this invention is to provide novel and improved security-capped containers having the stated attributes, and which are very reasonable in cost, simple

in construction, easily adaptable to be made from existing manufacturing molds with little change, and which are easy for adults to open and close, but for children impossible to open when properly closed, and which are efficient in carrying out the purposes for which they are designed.

Other objects and advantages will become apparent as this disclosure proceeds.

In the accompanying drawing forming part of this specification, similar characters of reference indicate corresponding parts in all the views.

FIG. 1 is a fragmentary elevational view of a bottle, shown partly in section, embodying teachings of this invention, including the tool furnished therewith to close it properly, open it when required and to serve as a gage to indicate when the cap is screwed on with the required degree of tightness.

FIG. 2 is an elevational view of said tool which is a spanner of special construction.

FIG. 3 is a perspective view of said spanner, in inverted position.

FIG. 4 is a fragmentary elevational perspective view of the bottle included in the package of FIG. 1.

FIG. 5 is a section taken at line **5—5** in FIG. 4.

FIG. 6 is a section taken at line **6—6** in FIG. 1, minus the spanner.

FIG. 7 is a perspective view of the cap included in FIG. 1, shown inverted.

FIG. 8 is a view like FIG. 1, but of a modified construction.

FIG. 9 is a fragmentary elevational perspective view of the bottle included in FIG. 8.

FIG. 10 is a section taken at line **10—10** in FIG. 9.

FIG. 11 is a section taken at line **11—11** in FIG. 8, minus the spanner.

FIG. 12 is a perspective view of the cap included in FIG. 8.

In the drawing, the numeral **15** designates generally a cap with internal threads **16**, to be screwed onto the bottle **17**, whose neck **18** has the external threads **19** therefor. This cap, on its peripheral wall's exterior, has a heightwise protuberance **2** of preferably rectangular transverse cross section to fit in the notch **21** in the inner edge wall of a ring spanner **22**, here shown having the diametrically opposite handles **23, 24**, for its manipulation. This spanner preferably has two teeth **25, 26**, extending downwardly from its undersurface, which will respectively enter and fit the notches **27** and **28** in the periphery of the annular seal offered by the collar or flange **29** around the base of the neck **18** of the bottle, if the spanner is slid down on the cap when the stop surface **30** on the cap, is in true face-to-face contact with the stop surface **31** on the bottle; said surface **31**, being midway between the notches **27, 28**. When such face-to-face contact is established, the cap **15** is deemed to have been screwed on with the required degree of tightness, which means that an adult need use the spanner **22** to loosen the cap **15**, hence it is certain that no child has sufficient strength to do so. Of course, to loosen the cap **15**, the spanner **22** is raised so that its teeth **25, 26** are out of the notches **27, 28**, because when said teeth are in them in any slight degree, the cap **15** is locked to the bottle **17**. It is evident that the spanner, besides it normal function to tighten and loosen the cap, also serves as a gage in conjunction with said notches **27, 28**, to test if the cap is properly tightened. If said teeth will enter said notches, the user will know that the cap is properly secured. If said teeth can not be entered, then the user will know that the cap must be turned more, to be properly closed. This

test should be made everytime the package is to be put away, using the spanner as a "go" and "no-go" gage as set forth. To avoid stress on the teeth **25, 26**, should the spanner **22** be attempted to be turned while in locked position, it is preferred to include the notch **32** in the flange **29**, for engagement by the underpad **33** on the handle **24** of the spanner, when said spanner is set in locked position; said notch and pad serving also as gaging means for the purpose aforesaid. The numeral **34** indicates a liner against the ceiling of the cap **15**, made of material having extremely slight resiliency, as polyethylene for example. When the cap is properly tightened, it is still spaced from the flange **29**, so the liner being pressed against the mouth rim of the bottle, will keep bottle contents air and moisture-proof.

Because of the appreciable force necessary to properly tighten the cap as described herein, the stop structure indicated by the numeral **35** which presents the stop surface **30** on the cap **15**, and the stop structure denoted by the numeral **36** which presents the stop surface **31** on the bottle **17**, must be very strong, so they will resist the tremendous stress they are subject to when the cap is tightened. It is found that the use of mere teats or the like as stops, cannot always be relied on. I have therefore devised stop "walls" having considerable "depth," to give them the strength to resist the force applied, and so I have made each stop means structure a one-tooth ratchet form, the wall of whose tooth is the stop surface.

Before identifying the one-tooth ratchet forms used as the stop means on the cap and bottle of the embodiment illustrated in the FIGS. 1–7, and in the modified embodiment shown in the FIGS. 8–12, it is to be noted that except for the particular types of ratchet structures used therein, both said embodiments are otherwise substantially identical. So in FIGS. 8–12, all parts which are identical or nearly so with the parts in FIGS. 1–7, bear the same reference numerals as in FIGS. 1–7, but primed. For example, the cap in the first embodiment is designated by the numeral **15**, while in the other, its cap is denoted as **15′**. The bottle in the first embodiment is designated as **17**, while in the second embodiment, the bottle bears the numeral **17′**, and so on.

The flange **29** on the bottle **17**, is fashioned to be a one-tooth ratchet formation **36**, whose tooth's surface **31** is the stop wall. The mouth rim of the cap **15**, is fashioned to be a one-tooth ratchet formation **35**, whose tooth's surface **30** is the stop wall, to be intercepted by the said stop wall **31**. When the ratchet formations are located as **35** and **36**, they are called crown ratchets.

The flange **29′** on the bottle **17′**, is fashioned to have a flat one-tooth ratchet formation **37**, whose tooth's surface **39** is the stop wall. The mouth of the cap **15′**, is fashioned to have an internal one-tooth ratchet formation **38**, whose tooth's surface **40** is the stop wall to be intercepted by the stop wall **39**. Here, the ratchet **37** is encircled by the cap's peripherial wall, when said stop walls **39** and **40** are in contact.

In FIG. 8, the cap **15′** tapers a bit from its mouth. This may prevent the spanner **22′** from coming down to rest on the flange **29′**, but it should allow that the teeth **25** and **26** do enter a bit into the notches **27′** and **28′** respectively, so that the spanner shall be able to serve as the required gage, and as a lock for the cap **15′**.

In practice, it is found that the height of any stop wall is sufficient if it is $\frac{1}{32}''$. So although the rim of the mouth of the cap **15** is an incline, as is the facing surface of the formation **36** on the bottle, there is hardly more than a slight notice of such appearance which is at variance with true flat as is ordinary. Note that in the construction shown in FIG. 8, there is no variance from normal appearance.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the embodiments shown herein shall be deemed merely illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the specific showings and description herein to indicate the scope of this invention.

I claim:

1. In combination, a container having an exteriorly threaded neck and an exterior annular part surrounding the base of said neck, an interiorly threaded cap tightly screwed on said neck and closing the container; the degree of tightness being such that the cap cannot be loosened when gripped in hand and attempted to be turned by an adult, a first one-tooth ratchet formation around the said neck and on said annular part, a second one-tooth ratchet formation around the rim region of the cap, on the cap; the face of the tooth of one of said formations being in contact with the face of the tooth of the other of said formations, and a separate spanner girding the peripheral wall of the cap and provided with a notch at said wall; said wall having an exterior protuberance along its height; said protuberance being fitted in said notch and the spanner being slidable along said protuberance; said spanner having a tooth extending towards said annular part; such annular part having a notch; said tooth on the spanner, being slidably fitted in said notch in said annular part, whereby the cap is maintained against rotation in relation to the container, whereupon shifting the spanner along said protuberance until the tooth leaves the said notch, an adult can then turn the spanner and thereby loosen the cap, of which a child is incapable, and upon the tightening of the cap after being loosened or replaced on the container, the tooth on the spanner will be able to enter the notch on said annular part, only when the faces of the teeth of said one-tooth ratchet formations are in contact, whereby the spanner also serves as a gage to determine when the proper degree of tightness is attained.

2. The combination as defined in claim **1**, wherein each of said formation is of the crown ratchet type.

3. The combination as defined in claim **1**, wherein the formation on the container is a flat ratchet protruding into said cap; the formation on the cap being of the internal ratchet type.

4. The combination as defined in claim **1**, wherein the notch and tooth on the spanner, have one face in common.

5. The combination as defined in claim **1**, wherein the cap, its protuberance and its ratchet formation, are integral, and wherein the container, said annular part thereon and the ratchet formation thereon, are integral.

6. The combination as defined in claim **1**, wherein said annular part seats the spanner when the tooth of the spanner is entered in the notch in said annular part.

7. The combination as defined in claim **1**, including means on the cap, for halting movement of the spanner towards said annular part when the tooth of the spanner has entered the notch in said annular part.

8. In combination, a container having an exteriorly threaded neck and an exterior annular part surrounding the base of said neck, an interiorly threaded cap tightly screwed on said neck and closing the container; the degree of tightness being such that the cap cannot be loosened when gripped in hand and attempted to be turned by an adult, a first protuberance on said annular part, a one-tooth ratchet formation around the rim region of the cap, on the cap; the face of the tooth of said formation being in contact with said first protuberance which is a stop therefor, a separate spanner girding the peripheral wall of the cap and provided with a notch at said wall; said wall having an exterior second protuberance along its height; said second protuberance being fitted in said notch and the spanner being slidable along said second protuberance; an adult being capable of turning the spanner and thereby loosen the cap, of which a child is incapable; wherein said spanner having a tooth extending towards said annular

part and said annular part having a notch; said tooth on the spanner being slidably fitted in said notch in said annular part, whereby the cap is maintained against rotation in relation to the container, whereupon shifting the spanner along the second protuberance until the tooth in said notch leaves said notch, an adult can then turn the spanner and thereby loosen the cap, and upon tightening of the cap after being loosened or replaced on the container, the tooth on the spanner will be able to enter the notch in said annular part, only when the face of the tooth of said one tooth ratchet formation is in contact with the first protuberance, whereby the spanner also serves as a gage to determine when the proper degree of tightness is attained.

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JOSEPH R. LECLAIR, *Primary Examiner.*

R. PESHOCK, *Assistant Examiner.*