United States Patent [19]

Wetzell

[11] **3,862,699**

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[54] **CAP SECURING MEANS FOR A CONTAINER**

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[52] **U.S. Cl.** **215/216,** 215/225

[51] **Int. Cl.** **B65d 55/02,** B65d 85/56, A61j 1/00

[58] **Field of Search** 215/9, 216, 225

[56] **References Cited**

UNITED STATES PATENTS

3,430,796	3/1969	Berg	215/225 X
3,642,161	2/1972	Stroud	215/216 X

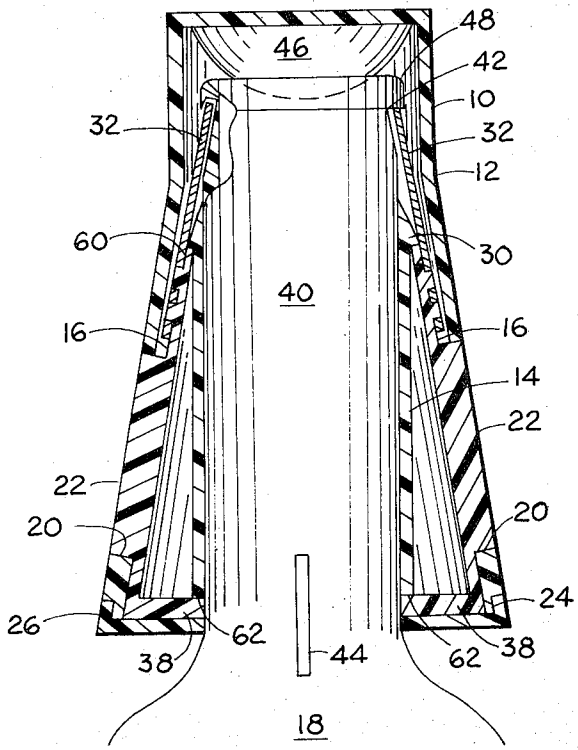
Primary Examiner—George T. Hall

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[57] **ABSTRACT**

A cap closes the mouth of a container and engages the adjacent end portion of the container by a latch having a blade engaging an annular groove in the container end portion. Release of the latch is accomplished by compression of a pad within the cap, moving the blade out of the groove, and by pivoting of the latch to a blade position to pass the groove, provided, however, that an arm abutment on the latch is clocked to a depression in the container permitting such pivoting of the latch.

8 Claims, 9 Drawing Figures



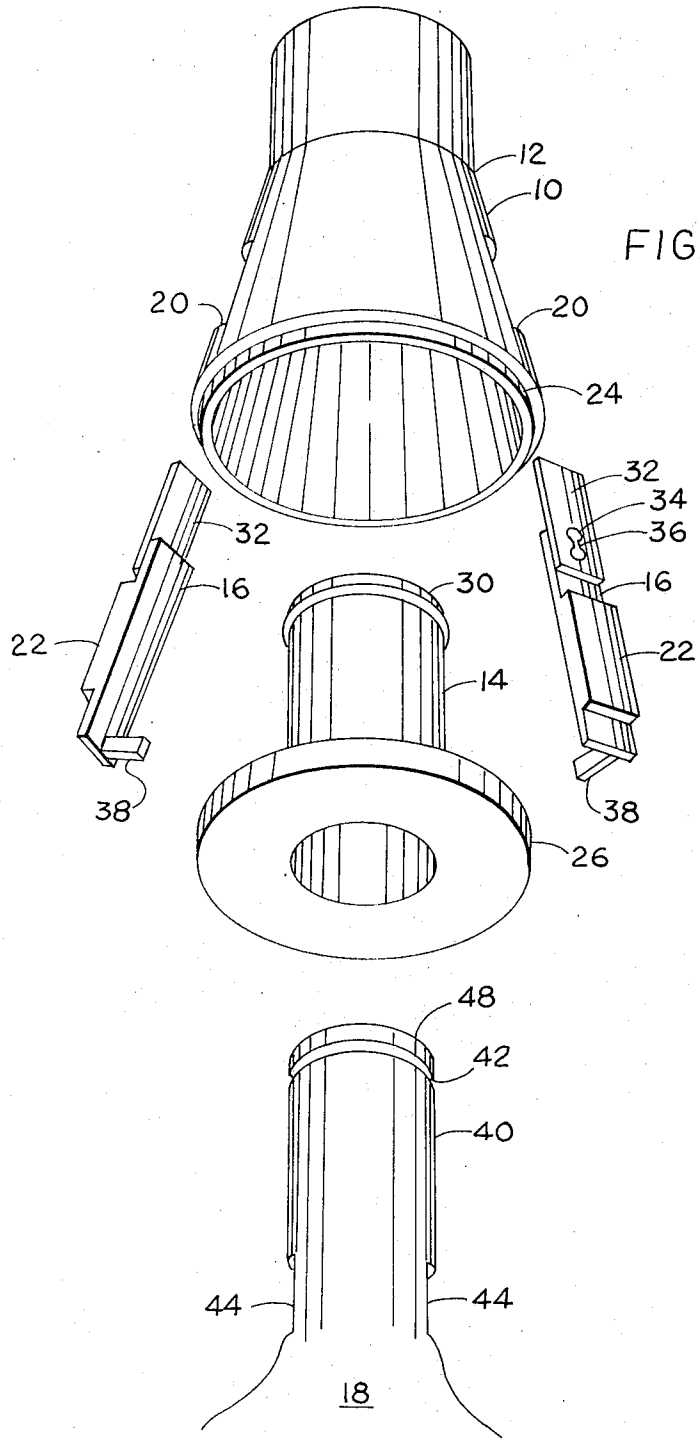


FIG. 1

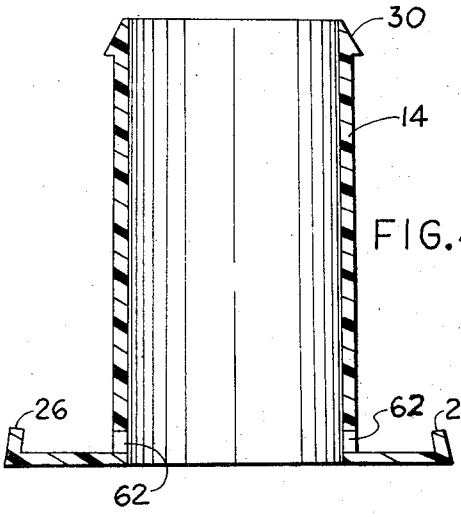


FIG. 4

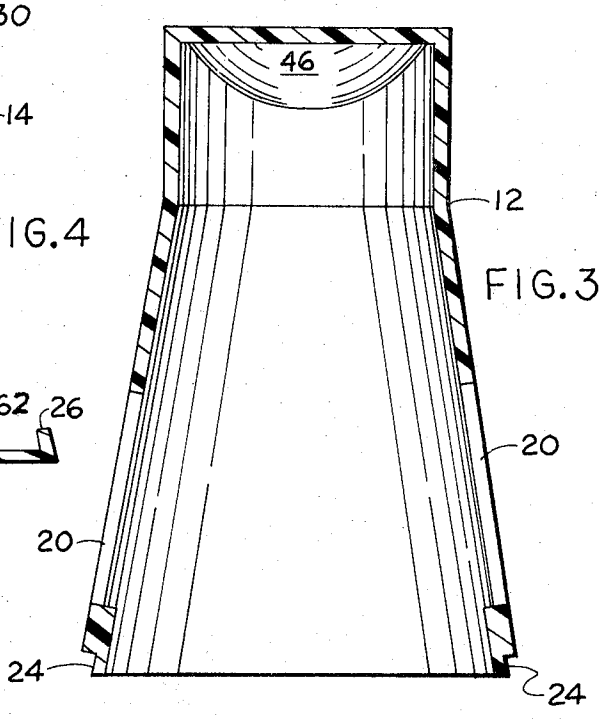


FIG. 3

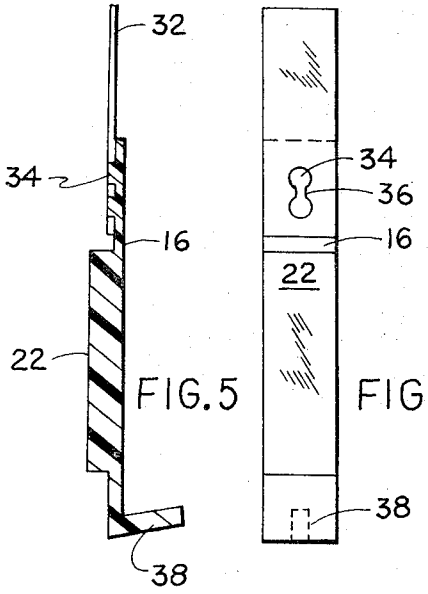


FIG. 5

FIG. 6

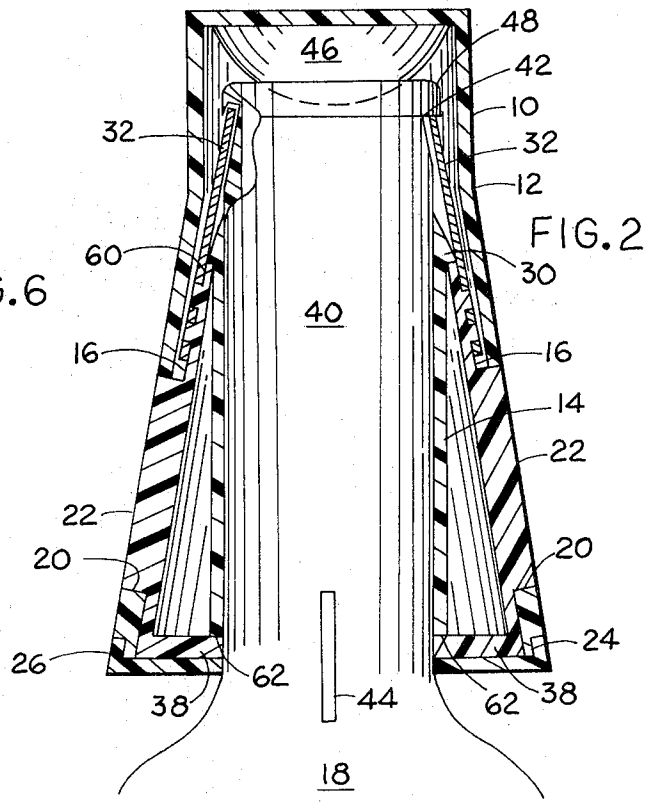


FIG. 2

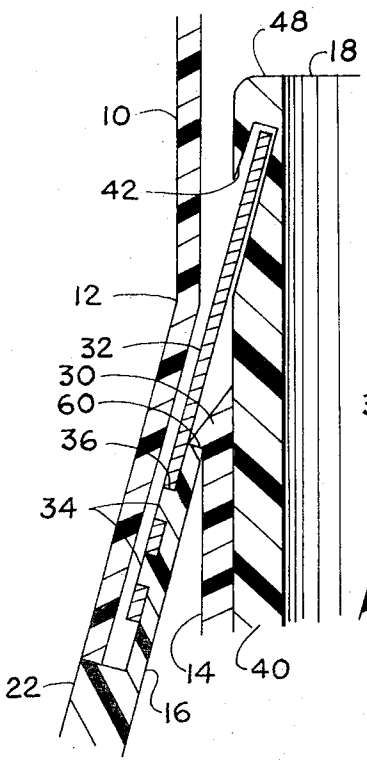


FIG. 7

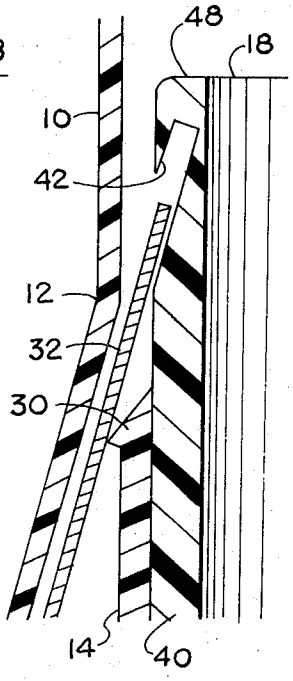


FIG. 8

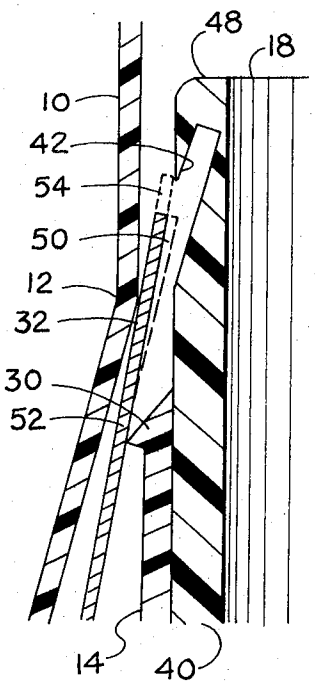


FIG. 9

CAP SECURING MEANS FOR A CONTAINER

BRIEF SUMMARY OF THE INVENTION

My invention relates to securing a container cap against removal by young children by requiring force on the cap, operation of a latch, and clocking of the cap.

Young children need protection against being able to open containers of medicines and toxic materials. A child grows in strength, manual dexterity, and ability to understand complex mechanisms. It is an object of my invention to devise a cap for such containers requiring strength, manual dexterity, and ability to understand complex mechanisms not possessed by children at ages wherein they most need such protection.

When children reach a certain general age it is to be expected they have been taught the dangers of medicines and toxic materials, which is fortunate as they reach an age when most forms of safeguarding, including locking, storing in high places, or the system described herein no longer will keep them from access to such materials. At such age, strength, manual dexterity, and ability to understand complex mechanisms are near to adult level. It would be difficult to pinpoint that age in general, and individual children differ in those abilities, but the most dangerous ages are five or six and below, and it is an object of my invention to protect as well as possible containers from access by those ages. My invention is not intended, however, to be a substitute for other safeguards, but it is recognized that small children are not sufficiently protected at present from access to dangerous materials.

Other objects of my invention include to provide a cap locking system that is reliable in operation, that provides several operations to unlatch, and that is economical to fabricate.

My invention will be best understood, together with additional objectives and advantages thereof, from the following description, read with reference to the drawings, in which:

FIG. 1 is an exploded view, in perspective, of a specific embodiment of my cap securing means for a container, showing all parts but an interior cap pad.

FIG. 2 is an elevational view, partly in section, of assembled parts.

FIG. 3 is an elevational view, partly in section, of an outer cap part.

FIG. 4 is an elevational view, partly in section, of an inner cap part.

FIG. 5 is an elevational, sectional view of the cap latch.

FIG. 6 is an elevational view of the latch shown in FIG. 5 but with the latch turned 90°.

FIG. 7 is an enlarged elevational view, fragmentary and partly in section, showing latching parts in latched position.

FIG. 8 is a view like that of FIG. 7 only with the latching blade withdrawn from the latching groove.

FIG. 9 is a view like that of FIG. 8 only with the latch pivoted to a position wherein the latching blade will miss the latching groove in return to the FIG. 7 position, as indicated in dashed lines.

FIG. 1 shows the basic parts which include an outer part 12 of the cap 10, an inner cap part 14, a pair of latches 16, and a container 18. Cap part 12 has openings 20 which receive bosses 22 on latches 16 so as to expose them for finger manipulation (inward pressure

to pivot the latches in the unlatching sequence.) Outer cap part 12 has a peripheral annular end recess 24 and inner cap part 14 has an end annular flange 26 (in generally L-shaped cross-section) which snaps into recess 24 (the draft of recess 24 and flange 26, somewhat exaggerated for clarity of illustration, being best shown in FIGS. 2, 3 and 4.) Inner part 14 has a peripheral annular flange 30, at its other end from flange 26, which serves as a fulcrum for pivoting latches 16. Latches 16 have latching blades 32 which may be formed of flexible spring metal and may be secured to the remainder of the latches 16 by bosses 34 extending into (press fit into) openings 36 in blades 32. Latches 16 have arm abutments 38 limiting latch pivoting under certain circumstances. Container 18 has an end portion 40 having a latching annular groove 42 and having longitudinal depressions 44 receiving the ends of latch arm abutments 38 in those circumstances, hereafter to be explained. One part not shown in FIG. 1 and shown in FIGS. 2 and 3 is a resilient pad 46 bonded in place in the inner end of cap 10 and sealing the mouth 48 of container 18.

Various parts may be made of different materials but preferably blades 32 are formed of metal as previously mentioned, the remainder of latches 16 and inner and outer cap parts 14, 12 are made of plastic, resilient pad 46 is made of rubber or a plastic solid or foam of rubber-like resilient characteristics, and container 18 is made of plastic or glass.

The primary latching action is accomplished by latch blades 32 in container groove 42. Actually, blades 32 and at least the adjacent portions of latches preferably should have limited transverse curvature as blade 32 fits in an annular groove, latch 16 pivots about an annular fulcrum 30 on inner cap part 14, and latch 16 is housed in outer cap part 12 which is annular in cross-section. However, this is a matter of tolerances and is not susceptible of ready illustration. As indicated, blades 32 are preferably formed of metal having spring characteristics, so that it will generally conform to the curvature of groove 42 (and, in fact, can also bend somewhat in inserting in groove 42 as long as it is initially caught in the groove.)

Groove 42 extends toward the adjacent end of container 40 as it extends inwardly. In FIG. 7, blade 32 is shown fully latched in groove 42. It will be understood that cap 10 is secured to container 18 against removal in this position. Blade 32 is withdrawn from groove 32, as illustrated in FIG. 8, when manual pressure is applied to cap 10, compressing pad 46 against the mouth 48 of container 40. It will be observed that cap 10 is unlatched from container 40 in the FIG. 8 position. Blade 32, however, will reinsert into groove 42 if pressure is released on cap 10. In order for the cap to remain unlatched as end pressure is released, blade 32 must be pivoted from the dashed-line position 50 of FIG. 9 to the full-line position 52 of FIG. 9. Then when cap pressure is released, blade 32 will pass the lip of groove 42 without being cammed inwardly, as shown in dashed lines 54 in FIG. 9. After blade 32 passes the lip of groove 42, it could be distorted, as all that is required is passage. In terms of the overall design of this latching system, this is the area of critical dimensions and tolerances, as will be evident. As the illustrations are not manufacturing drawings, only the action is illustrated, to show the functions; and angles, dimensions and tolerances will be important and will need to be carefully

controlled in manufacturing design in order to accomplish the actions described in connection with FIGS. 7–9.

It will be understood that cap **10** is unlatched from container **18** once blade **32** has reached the dashed-line position **54** of FIG. **9**. The only manual action directly specified to accomplish this was pressure on the end of cap **10** to compress pad **46**. An implicit manual action, however, was that blade **32** be pivoted from the position **50** to the position **52** in FIG. **9**. This is accomplished by a second manual action, which is manual pressure by fingers and/or thumb on bosses **22** of latches **16** to pivot latches **16** about the annular fulcrum **30** on inner cap part **14**. (Fulcrum **30** also forms an abutment to the adjacent ends of latches **16**, as indicated at **60** in FIGS. **2** and **7**, to hold latches **16** in position.) Note this must be done in sequence, i.e., no unlatching results if bosses **22** are pressed before end pressure is applied to cap **10**. Latches **16** must be withdrawn to the positions of FIGS. **8** and **9** before blades **32** can be pivoted to unlatched positions. This means an infant, to release the cap must have enough strength to compress pad **46** and must understand or discover (or accidentally accomplish) to thereafter press two latch bosses **22** inwardly at diametrically opposite points on the cap.

A further requirement to achieve unlatching is rotary clocking of latch arm abutments **38** to a pair of diametrically opposite depressions **44** on the end portion **40** of container **18**. Inner cap parts have openings **62** to receive the ends of arm abutments **38**. The ends of arm abutments **38** normally nearly abut the surface of container end portion **40**, or at least are close enough to abutment to prevent pivoting of latch **16** sufficiently to bring blade **32** from the position **50** to the position **52**. Only when the ends of arm abutments **38** are clocked into alignment with depressions **44** (by rotation of cap **10**) will abutments **38** permit latches **16** to pivot enough to move blades **32** to unlatched positions. This requires another perception and action of a child or an accidental action improbable to occur in conjunction with the other requirements of unlatching.

The action of my invention has been described above. To briefly review the operation, unlatching only occurs when manual end pressure is applied to cap **10** compressing pad **46**, moving blades **32** to the FIG. **8** position, when thereafter latch bosses **22** are both pressed while maintaining end cap pressure, and when arm abutments **38** have also been clocked to depressions **44**. Whereas it is not necessarily impossible that an infant could perform all of these operations, provided the infant was strong enough to compress pad **46** sufficiently, this is improbable and has lower probability generally according to decreasing age of the child. This, hopefully together with normal household precautions, should greatly reduce, if not eliminate, very small child access to containers using my new cap. At some age a child will have the strength, dexterity and understanding to unlatch the cap but at that age the child should have been taught to avoid dangerous materials. In any case, perhaps nothing much more can be done as a practical matter in terms of cap unlatching complexity than I have provided when the child reaches an age where he could unlatch my cap.

In reinstalling cap **10** on a container **18**, end pressure on cap **10** to compress pad **46** is all that is needed. In that case the normal disposition of blade **3** will be as shown in FIG. **7** during reinstallation of the cap, but blade **32** can flex sufficiently to pass the end of container **18** until groove **42** is passed, whereupon release of the cap will result in blades **32** entering groove **42**. If blade **32** were not flexible, reinstallation of cap **10** would be difficult or impossible unless depressions **40** extended sufficiently toward the end of the container so that latches **16** could be pivoted to unlatched positions during cap reinstallation. It will be observed in cap unlatching, after blade position **54** has been reached, at some point arm abutments **38** will ride out of depressions **44** in cap removal, so that latches **16** will resume their unlatched pivotal positions, but this is accommodated by flexing of blades **32** during the remainer of cap removal, to the extent the end of container **18** has not been reached.

Having thus described my invention, I do not wish to be understood as limiting myself to the exact details of construction shown. Instead, I wish to cover those modifications of my invention that will occur to those skilled in this field after learning of my invention and that are properly within the scope of my invention.

I claim:

1. The improvement in securing means for a cap closing the mouth of a container and engaging the end portion of the container adjacent to said mouth, comprising:

a. said cap having resilient means in the interior thereof, said resilient means being uncompressed in a normal first position of said cap and said cap being movable to a second position further onto said end portion of said container by compressing said resilient means,

b. said container having an annular groove in said end portion adjacent to said mouth, said groove slanting toward the mouth end of said container as it extends inwardly,

c. said cap having a latch pivotally mounted in said cap and manually pivotal, said latch having a blade at one end having a normal position extending to within said groove in said first position of said cap and having a removed position withdrawn from said groove in said second position of said cap, said blade having a first pivotal position in pivotal adjustment of said latch located to insert into said groove when said cap is moved from said second position to said first position of said cap and said blade having a second pivotal position in pivotal adjustment of said latch located not to strike said groove when said cap is moved from said second position to said first position of said cap, whereby to remove said cap when said blade is disposed in said groove and said latch is in its first pivotal position, said cap is pressed to move from its normal first position to its second position thereby withdrawing said blade from said groove and said latch is moved to its second pivotal position and said cap is permitted to move back to its first position so that said blade passes said groove, so that said cap is not restrained by said latch from removal.

2. The subject matter of claim **1** in which said container has a depressed portion in its outer surface extending longitudinally thereof, and said latch has on its end opposite to said blade an arm abutment extending normally to prevent pivotal movement of said latch moving said blade from said first to said second pivotal position of said blade by abutting the outer surface of

said container except when said abutment is clocked into position aligned with said depressed portion, whereby said cap can only be removed by movement of said cap from its first to its second position, clocking of said abutment to said depression, and manual pivoting of said latch.

3. The subject matter of claim 2 in which said cap has an outer cup-shaped outer portion and in which said latch is disposed within said outer portion, and said outer portion has an opening for manual access to said latch from outside said cap, and in which said cap has an inner annular portion with an annular end flange generally L-shaped in cross-section securing said inner portion to said outer portion by snapping on an end of said outer portion, said inner portion having at its end opposite to said flange exterior rib means acting as a fulcrum and said latch being pivotally mounted by pivoting about said fulcrum.

4. The subject matter of claim 1, in which said cap has a fulcrum about which said latch pivots, and in which there are two latches at diametrically opposite positions in said cap.

5. The subject matter of claim 1 in which said resilient means is a pad abutting said mouth of said container.

6. The subject matter of claim 5 in which said pad has a rounded convex shape and seals said mouth in said first normal position of said cap.

7. The improvement in securing means for a cap closing the mouth of a container and engaging the end portion of the container adjacent to said mouth, comprising:

a. said container having annular engageable means on said end portion,

b. said cap having a latch which has a latching means and is movably mounted in said cap, said latch being manually movable between a first normal position in which said latching means is disposed to engage said engageable means as it passes the area of said engageable means and a second position in which said latching means is disposed not to engage said engageable means as it passes the area of said engageable means, and

c. said container having means forming a depression on its outer surface, said latch having an abutment normally preventing movement of said latch from said first position to said second position of said latch by abutting the outer surface of said container except when said abutment of said latch is clocked into position aligned with said depression, whereby said cap can be removed only by aligning said abutment of said latch with said depression thereby permitting said latching means to pass said engageable means.

8. The improvement in securing means for a cap closing the mouth of a container and engaging the end portion of the container adjacent to said mouth, comprising:

a. said container having an annular groove in said end portion adjacent to said mouth, and

b. said cap having a latch pivotally mounted in said cap and manually pivotal, said latch having a blade having a normal position extending to within said groove, said cap having resilient means permitting under manual force the movement of said blade to a removed position withdrawn from said groove, said blade having a first pivotal position in pivotal adjustment of said latch located to insert into said groove when said blade is permitted to move from said removed position back toward said normal position upon discontinuance of force applied to said resilient means, said blade having a second pivoted position in pivotal adjustment of said latch located not to strike said groove when said blade is permitted to move from said removed position back toward said first normal position upon discontinuance of force applied to said resilient means, whereby to remove said cap when said blade is disposed in said groove, force is applied to said resilient means thereby moving said blade from said normal position to said removed position and said latch is pivoted so that said blade is moved to its second pivotal position, so that said cap may be removed without said blade becoming engaged in said groove.

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