Aug. 14, 1962 S. E. EDELSTONE ET AL 3,049,262

SNAP-ON CONTAINER CAP LOCK

Filed Feb. 1, 1960 2 Sheets-Sheet 1

Fig. 1

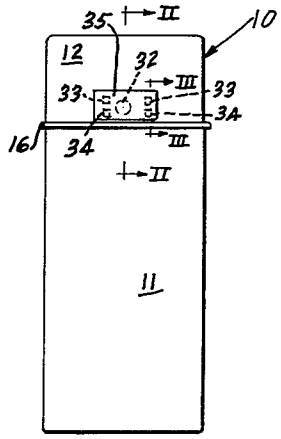


Fig. 2

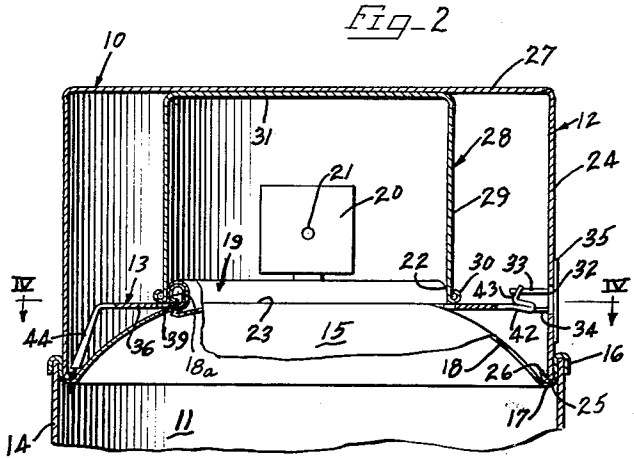


Fig. 3

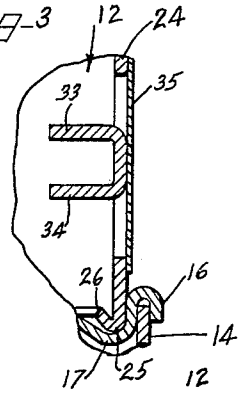


Fig. 4

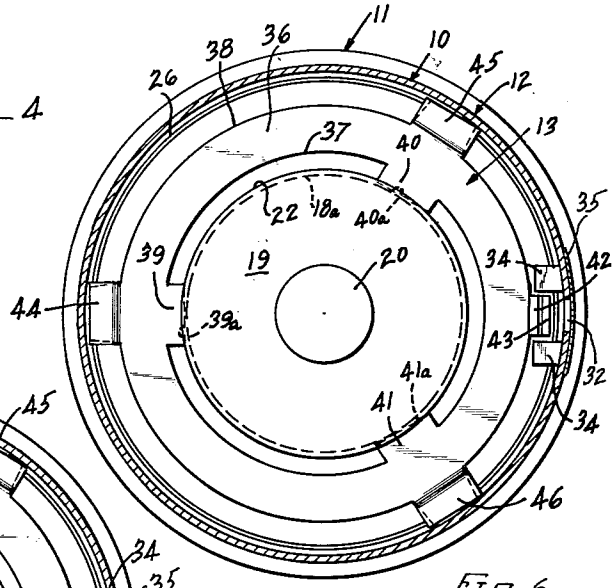


Fig. 5

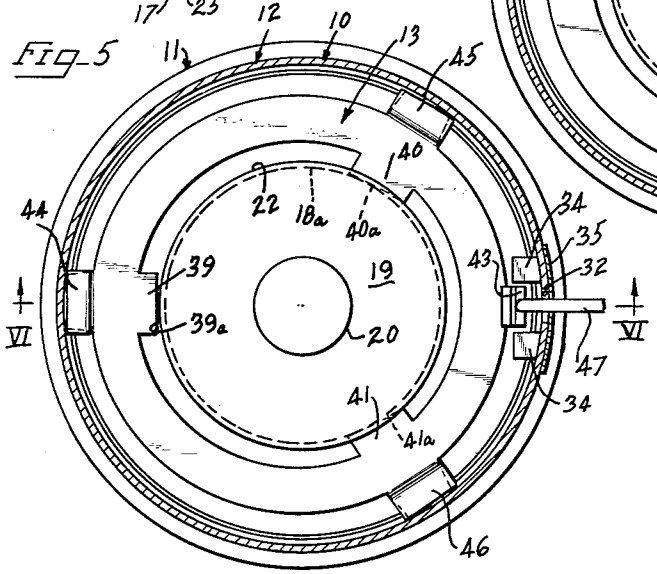
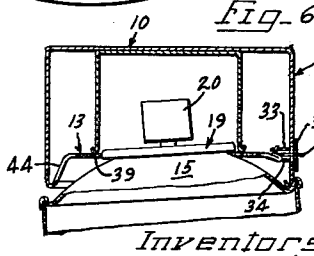


Fig. 6



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Fig. 7

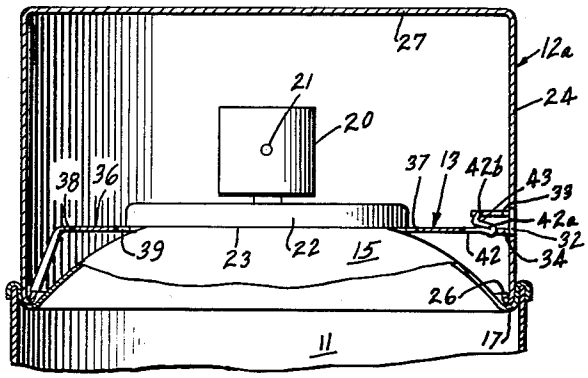


Fig. 8

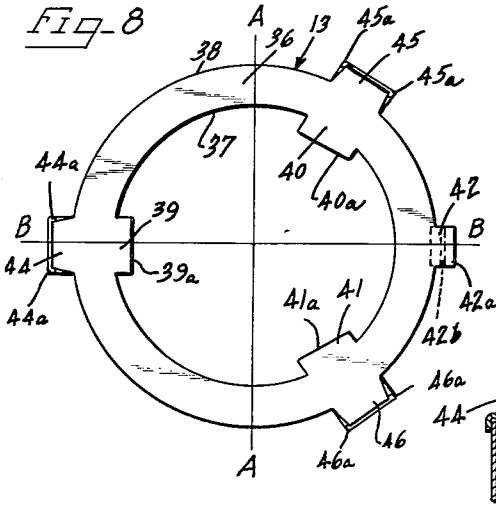


Fig. 9

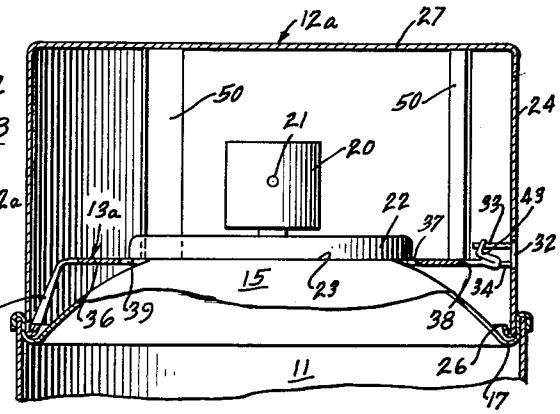


Fig. 10

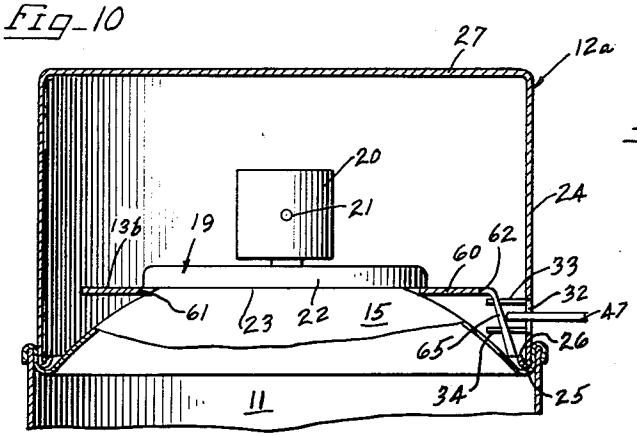
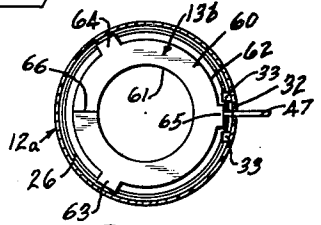


Fig. 11



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SNAP-ON CONTAINER CAP LOCK

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11 Claims. (Cl. 220—55)

This invention relates to locks or seals for container caps and particularly deals with lock rings preventing unauthorized removal of container caps while accommodating authorized removal of such caps upon shifting of the ring through an access hole in the cap.

The invention will be hereinafter specifically described in connection with locks or seals for the snap-on caps of spray dispensing aerosol cans, but it will be understood that the principles of this invention are generally applicable for many other uses and that the invention provides disposable inexpensive locking rings which prevent unauthorized tampering with goods contained in a closed package. In the circumstances this invention is not to be interpreted as limited to the hereinafter specifically described embodiments.

The tendency for shoppers to remove the caps from aerosol cans and to then depress the valve resulting in spraying the high pressure contents of the can onto adjacent merchandise is a well recognized detriment to the merchandising of aerosol products and especially spray paints and enamels.

The locks or seals of this invention are inexpensive, disposable, and extremely simple to unlock once authorized access is permitted. On the other hand the locks are very firm, relatively foolproof and capable of resisting the maximum forces which might be manually applied to the cap and container for unauthorized separation. Authorized access to the locks is obtained only through a hole or window in the cap and this hole or window is sealed with a puncturable cover. When the cover is punctured by a prodding implement such as a nail, pencil, or the like, the seal is then shifted by the implement to an unlocked position releasing the cap from the container.

The locks of this invention are directly usable on aerosol containers of conventional design which have a spray valve carrying cup crimped to the domed end head of the container and thereby provide an underlying shoulder receiving the lock. The lock then extends from this shoulder to engage the conventional inturned lip of the container cap. The cap itself is only modified to provide an access window through which the prodding implement can be inserted for shifting the lock to its unlocked position thereby accommodating removal of the cap. In one form of the invention the lock is shifted laterally to unseat it from the shoulder provided by the valve cup. In another form of the invention a portion of the lock is shifted off of the inturned lip of the cap. In both forms the shifting of the lock accommodates easy removal of the cap with the lock being removed from the container in the first form and with the lock being removed from the cap in the second form.

The locks of this invention need not be spread, twisted or misshaped to accomplish their unlocking function and can therefore be made of relatively rigid materials, such as spring steel, although it should be understood that any stress resisting material can be used that has some degree of resiliency including plastics such as nylon, Teflon (polyfluoroethylene resins), bass, and the like.

It is then an object of this invention to provide a lock or seal for capped containers which is readily shiftable to an unlocked position by a prodding type implement inserted through a window in the cap.

A still further object of this invention is to provide a

lock for preventing unauthorized access to the spray valve of aerosol cans which is easily shifted to an unlocked position when access thereto is permitted by puncturing a sealed hole in the cap of the container.

A still further object of this invention is to provide a locking ring having portions retained by a container and other portions retained by a cap for the container wherein at least one of said portions is shiftable to permit separation of the cap from the container.

A specific object of the invention is to provide a locking ring for preventing unauthorized removal of snap-on caps from containers which ring has inturned lugs engageable with a shoulder of the container and outturned legs engageable with a lip of the cap and wherein the cap has a window sealed with a puncturable cover accommodating insertion of a prodding implement to unseat either the lugs from the shoulder or the legs from the lip to permit removal of the cap.

A still further object of this invention is to provide an inexpensive metal locking ring having lugs and legs which are shiftable to unlocked position and are capable of fixedly retaining a cover on a container in their locked position.

A still further object of the invention is to provide a locking ring having inturned lugs and depending legs so arranged and positioned as to respectively engage oppositely facing shoulders of a container and cap to lock the cap to the container.

A specific object of the invention is to provide a locking ring for preventing unauthorized removal of the snap-on cap of aerosol cans having domed ends with valve cups secured therein and cooperating therewith to provide an annular shoulder, which locking ring has an internal diameter larger than the valve cup to freely surround the valve cup and has inturned lugs detachably engageable with the shoulder provided by the valve cup, together with depending legs detachably engageable with the inturned lip of the cap and also provided with means for receiving thereagainst the prodding type implement inserted through a hole in the cap for shifting the ring laterally to unseat the lugs off of the shoulder and permit removal of the cap.

Other and further objects of this invention will be apparent to those skilled in this art from the following detailed description of the annexed sheets of drawings which, by way of preferred examples only, illustrate several embodiments of the invention.

FIGURE 1 is an elevational view of an aerosol can closed by a large diameter snap-on cover equipped with a sealed window and locked to the can by a locking ring of this invention;

FIGURE 2 is an enlarged fragmentary vertical cross sectional view along the line II—II of FIG. 1;

FIGURE 3 is an enlarged fragmentary vertical cross sectional view along the line III—III of FIG. 1;

FIGURE 4 is a horizontal cross sectional view along the line IV—IV of FIG. 2;

FIGURE 5 is a view similar to FIG. 4 but illustrating the locking ring in its unlocked or laterally shifted position;

FIGURE 6 is a view similar to FIG. 2 but taken along the line V—V of FIG. 5 showing the unlocked position of the ring;

FIGURE 7 is a view similar to FIG. 2 but showing the lock ring of this invention in combination with a large diameter cap that does not have an inner cup;

FIGURE 8 is a plan view of the locking ring of FIGS. 1 to 7;

FIGURE 9 is a fragmentary vertical cross sectional view similar to FIG. 7 but showing a modified locking ring of this invention;

FIGURE 10 is a view similar to FIG. 7 but showing

a second modified embodiment of locking ring of this invention; and

FIGURE 11 is a plan view of the locking ring of FIG. 10.

As shown on the drawings:

The assembly **10** of FIGS. 1 to 6 includes an aerosol spray dispensing can **11**, a large diameter inner cup equipped snap-on cap **12** and a lock ring **13** of this invention.

As best shown in FIG. 2, the can **11** has a cylindrical body **14** with a domed top end head **15** crimped to the cylindrical body **14** and providing an external bead **16** and an annular well **17** surrounded by the rim or bead **16**. The end head **15** has a fragmental spherical domed portion **18** rising upwardly from the annular well **17** to a smaller diameter opening which is at a level above the top of the body **14**. This opening is closed by a valve cup **19** carrying a spray valve with a projecting head **20** that is depressed to release the contents of the can through an orifice **21**. The valve cup **19** has a rim **22** crimped over the wall portion **18** of the head and providing a skirt with a bottom edge **23** forming a shoulder around the top of the dome head **15**. This shoulder faces downwardly toward the container body.

The large diameter cap **12** is thimble or cup-shaped with a cylindrical side wall **24** terminating in an inturned rolled end or bead **25** that forms a shoulder **26** facing upwardly or opposed to the downwardly facing shoulder **23**. This side wall **24** is of a diameter to fit snugly in the well **17** with the inturned rolled end **25** bottomed in the well.

The cap **12** has a flat top end wall **27** carrying an internal thimble or cup **28** with a cylindrical side wall **29** snugly embracing the rim or skirt **22** of the valve cup **19** and having an outturned bead or rim **30** on the end thereof. The inner thimble or cup **28** has a flat top wall **31** secured to the top wall **27** in any suitable manner.

From the above description it will therefore be understood that the large diameter cap **12** is sized to fit into the well **17** with its inner cup or thimble **28** snap fitted on the rim or skirt **22** of the valve cup **19**. The spray valve head **20** fits freely in the inner cup **28**.

The side wall **24** of the outer cup or cap **12** has a hole **32** therethrough positioned to be level with the shoulder **23** of the valve cup **19** when the cap **12** is bottomed in the well **17**. This hole is straddled by a pair of top inturned tangs **33** and a pair of bottom inturned tangs **34** that are lanced from the side wall **24** and positioned to form aligned top and bottom abutments at each side of the hole **32**.

The hole **32** and the openings in the side wall **24** created by the lancing of the inturned tangs **33** and **34** are covered with a puncturable membrane or seal **35** that is adhesively secured to the side wall **24**. This seal **35** can be composed of any suitable material that is easily punctured by a prodding implement. Material such as paper, metal foil, cellophane, and the like, are useful.

The illustrated lock ring **13** has a circular body annulus **36** with an inner periphery **37** large enough to fit freely around the valve cup **19** in spaced concentric relation from the skirt **22** thereof and an outer periphery **38** of materially smaller diameter than the side wall **24** of the cap **12** to fit freely inside of this cap. The body **36** is flat between the inner and outer peripheries thereof. Three lugs or locking dogs **39**, **40** and **41** project radially inward from the inner periphery **37** and are integral with the body **36** and in the same plane as the body. These lugs, as best shown in FIG. 8, are unequally spaced with the lugs **40** and **41** lying on one side of the vertical ring bisector A—A and the other lug **39** lying on the horizontal bisector B—B. The lug **39** has a flat edge **39***a* at right angles to the projected plane of the lug while the lugs **40** and **41** have inclined inner edges **40***a* and **41***a* tapered back from the edge of the lug closest to the bisector A—A.

A tang **42** projects outwardly from the outer periphery **38** of the body **36** on the same diameter line B—B as the lug **39** but diametrically opposite of the lug. This tag has the forward edge end thereof bent back as shown at **42***a* in FIG. 7 and thence upwardly and forwardly as shown at **42***b*, thus providing a recessed abutment **43** to receive a prodding type implement thereagainst for shifting the ring as will hereinafter be more fully described.

The outer periphery **38** of the ring body **36** has three depending outwardly inclined legs **44**, **45** and **46** preferably aligned with the lugs **39**, **40** and **41**, respectively. Each of these depending legs slopes downward and outward from the ring body **36** and has inturned corners at the bottom outer ends thereof as shown at **44***a*, **45***a* and **46***a*. In their free state the legs **44**, **45** and **46** project outwardly to lie on a circle having a diameter which is greater than the diameter of the circle formed by the inside of the cylindrical wall **24** of the cap **12**.

As shown in FIGS. 2 and 4, the lock **13**, in its locked assembled position, has the body ring **36** thereof disposed around the valve cup **19** with the locking dogs **39**, **40** and **41** underlying the shoulder **23**. The outwardly projecting tang **42** is straddled by the inwardly projecting tangs **33** and **34** so that the ring **13** cannot rotate around the valve cup **19** and the implement receiving abutment **43** of the tang **42** will be held in alignment with the hole or window **32**.

The three legs **44**, **45** and **46** are flexed somewhat inwardly by the cylindrical wall **24** of the cap **12** and have their bottom edges seated on the shoulder **26** provided by the inturned lip of the cap. The inturned ends **44***a*, **45***a* and **46***a* of these legs prevent the bottom edges of the legs from entering the recess or well provided by the inturned lip so as to insure release of the legs from the cap.

As best shown in FIG. 4, in the locked position, the body ring **36** is concentric with the skirt **22** of the valve cup and the inner edges of each of the locking dogs **39**, **40** and **41** are thereby positioned in underlying relation to the shoulder **23**. At the same time each of the bottom edges of the depending legs **44**, **45** and **46** are seated on the shoulder **26** of the inturned cap lip. Since the shoulders **23** and **26** face in opposite directions and are fixed parts of the can and cap respectively, the lock **13** effectively prevents removal of the cap from the can. Since the lock **13** may be made of relatively strong spring metal it will resist unauthorized deflection and will prevent manual separation of the cap from the can. The slight deflection of the legs **44**, **45** and **46** by the side wall **24** of the cap will center the ring body **36** in the locked position but the large inner periphery **37** of the ring body **36** will of course accommodate lateral shifting of the ring body.

As shown in FIG. 4 the inner edge **39***a* of the locking dog **39** cooperates with the sloped inner edges **40***a* and **41***a* of the locking dogs **40** and **41** to keep the ring body **36** locked under the shoulder **23** even though the ring body is of larger diameter than the valve cup. The backwardly sloped edges **40***a* and **41***a* however will accommodate forward shifting of the dogs **40** and **41** around the upstanding wall **18***a* that defines the opening of the wall **18** through which the valve cup **19** fits and on which the valve skirt **22** is crimped.

As shown in FIGS. 5 and 6 when the seal **35** is punctured by a prodding implement **47** and forced against the tang abutment shoulder **43** opposite the window **32**, the entire lock **13** will be laterally shifted to move the dog **39** out from under the shoulder **23** while the dogs **40** and **41** ride on their inclined edges **40***a* and **41***a* toward the diameter or bisector A—A. The backing leg **44** behind the lug **39** will of course be deflected to accommodate this shifting. In this laterally shifted position of the lock **13**, the cap **12** can be easily tipped forwardly and released from the container with the lock **13** being

carried by the shoulder 26 of the cap moving the lock with the cap, as shown in FIG. 6.

As shown in FIG. 2, the inner cup 28 has its outturned bead or lip 30 bottomed on the inwardly projecting dogs or lugs 39, 40 and 41 so that the lock 13 cannot fall into the cap even when it is removed from the shoulder 23 of the can. Therefore in the form of FIGS. 1 to 6 inclusive the lock is retained by the cap after removal of the cap from the can. To reapply the cap it is only necessary to reseat the side wall 24 into the well 17 whereupon the rounded skirt 22 of the valve cup will effect lateral shifting of the locking dogs 39, 40 and 41 until they snap under the shoulder 23 whereupon the container will again be locked.

In the form of container cap shown in FIG. 7, however, the locking ring 13 is not retained by the cap after removal because the cap 12*a* as shown is not equipped with an internal cup 28. Otherwise the assembly is identical with that described in FIGS. 1 to 6 and corresponding parts have been marked with the same reference numerals. In the arrangement of FIG. 7, once the lock 13 has been laterally shifted and removed from the can 11, it will drop loose inside of the cap 12*a* and will probably fall out of the cap. Therefore the inner cup 28 of FIGS. 1 to 6 not only serves as a snap-on connection for retaining the cap 12 on the valve cup skirt 22 but also cooperates with the cap shoulder 26 to serve as a retainer for the lock.

In the embodiment of FIG. 9, a slightly modified lock 13*a* is provided to retain the cap 12*a* on the container 11 and to remain inside of the cap even after removal. In this embodiment parts identical with parts described in FIGS. 1 to 8 have been marked with the same reference numerals.

As shown in FIG. 9, the lock ring 13*a* has upstanding legs 50 projecting upwardly from the outer periphery 38 of the ring body and bottomed against the top wall 27 of the cap 12*a*. The ring 13*a* has the same depending legs 44, 45 and 46 as the ring 13 and these legs when bottomed on the cap shoulder 26, cooperate with the legs 50 bottomed on the cap top 27, for retaining the lock 13*a* inside of the cap even when the cap is removed from the can by laterally shifting the dog 39 out from under the shoulder 23 of the valve cup. Two legs 50 are shown in FIG. 9 but it should be understood that three or four legs can be provided at equally spaced distances around the periphery 38 for forming a stable support for the ring body 36. In this embodiment therefore the inner cup 28 of FIGS. 1 to 6 is replaced by lock legs 50 for retaining the lock in the cap. The arrangement otherwise operates in the identical manner described in FIGS. 1 to 6.

In the embodiment of FIGS. 10 and 11, a further modified lock 13*b* is provided for securing a cap 12*a* to a can 11 and parts identical with parts described in FIGS. 1 to 9 have been marked with the same reference numerals. The cap 12*a* of FIG. 10 like the cap 12*a* of FIG. 7 is free from the inner cup 28. The lock 13*b* as shown in FIG. 11 has a split ring body 60 with a circular inner periphery 61 that is free from the inwardly projecting dogs of the locks 13 and 13*a*. The outer circular periphery 62 of the ring body 60 has three depending legs 63, 64 and 65 in equally spaced relation. The inturned tangs 33 and 34 of the cap 12 straddle one of the legs 65 to hold this leg in alignment with the window 32.

The inner periphery 61 of the ring body 60 is of smaller diameter than the skirt 22 of the valve cup 19 but the split ring body 60 is expandable by opening up a gap at the split ends 66 thereof to embrace the skirt 22 and snap under the shoulder 23 to be retained by the can 11. Alternately, the ring body 60 can be continuous and placed in position on the can before the valve cup skirt 22 is crimped to the can or the continuous ring can be conically deformed to snap over the skirt and then flattened under the shoulder 23. The ring body 60 is not laterally shiftable on the can but the leg 65 opposite the window 32 can be deflected inwardly off of the shoulder 26 by the prodding implement 47 to accommodate tilting of the cap 12*a* off of the can. Upon removal of the cap 12*a*, the lock 13*b* will remain on the can but the cap may be reapplied because the inturned lip 25 of the side wall of the cap 12*a* will accept the legs 63, 64 and 65, depressing them inwardly until they snap back onto the shoulder 26 provided by the lip and thereupon relocking the assembly.

The legs 63, 64, 65 have the same inturned corners as the legs 44, 45 and 46 of the lock 13 to prevent the legs from being caught in the well behind the shoulder 26.

From the above description it will therefore be understood that this invention now provides inexpensive lock rings for container caps which are shiftable under the action of a prodding implement inserted through a cap window to unlock the cap from the container. It will of course be understood that many variations can be made in the shiftable lock portions and the illustrated embodiments are only intended as examples of suitable arrangements for shifting the lock relative to the can or cap.

We claim as our invention:

1. In a can and cap assembly including a can with a domed end having a downwardly facing shoulder at the apex thereof and a cap well at the base thereof and a cup shaped cap overlying the domed end and bottomed in said well, the improvements of an internal upwardly facing shoulder in said cap adjacent said well, a hole in said cap aligned radially with said downwardly facing shoulder, a puncturable cover overlying said hole, a cap lock ring surrounding said apex of the domed end, internal dogs on said ring underlying said downwardly facing shoulder, spring legs on said ring bottomed on said internal cap shoulder, a tang on said ring adjacent said hole, and said tang providing an abutment to receive a prod inserted through said hole for laterally shifting the ring to move a dog beyond said downwardly facing shoulder and thereby accommodate removal of the cap and ring from the can.

2. In a can and cap assembly including a can with a domed end having an upstanding annular rim at the apex thereof and providing an annular downwardly facing shoulder therearound, said domed end having an annular well at the base thereof, and a cup shaped cap with a cylindrical side wall bottomed in said well and having an internal annular shoulder facing upwardly, an inner thimble secured in said cap having a cylindrical side wall in spaced concentric relation inside of the side wall of the cap and snugly embracing the upstanding rim of the domed end, the outer cylindrical side wall of the cap having a hole therethrough, a puncturable seal secured on said side wall of the cap covering said hole, and an inwardly lanced tang at both sides of the hole on the side wall of the cap forming abutments inside the cap straddling the hole, the improvement of a locking ring surrounding the upstanding rim of said domed end and abutted against the end of the cylindrical side wall of the thimble on said rim, said locking ring having an inwardly projecting dog underlying the shoulder provided by the rim in diametrically opposite relation to said hole, said locking ring having a pair of inwardly projecting dogs underlying said shoulder of the rim in opposed relation to the first mentioned dog, said dogs cooperating with said shoulder of the rim to retain the ring on the domed end of the can, said ring having a radially projecting tang between the lanced tangs of said cap providing an abutment opposite said hole of the cap, a plurality of springy legs depending from said ring bottomed on said internal shoulder of the cap, and said ring being laterally shiftable on said domed end of the can by radial thrust of a prodding implement inserted through said hole against the abutment provided by the tang of the lock for moving the diametrically opposite dog outwardly from the rim shoulder to thereby accommodate tilting of the cap off of the can for movement of the other dogs out

from under said rim shoulder and thereby accommodate separation of the cap from the can.

3. In combination with a can having a domed end with a rim at the apex thereof providing a downwardly facing shoulder and a well at the base thereof, a cup shaped cover overlying said domed end having an internally shouldered side wall bottomed in said well and a hole through said side wall aligned with said downwardly facing shoulder, the improvement of a locking ring surrounding said rim at the apex of the domed end and having inwardly projecting dogs underlying said shoulder, depending spring legs on said lock ring biased against the side wall of the cap and bottomed on the internal shoulder of the cap, said lock ring having a radial projecting abutment adjacent the opening in the cap, and said opening accommodating a prodding implement to thrust against said abutment for shifting the lock ring to move a dog outwardly from said shoulder and thereupon accommodate tipping of the cap off of the container to move the other dogs outwardly from said shoulder thus separating the cap and container.

4. A locking ring comprising an annulus body having a plurality of depending spring legs adapted to be bottomed on a cap for a container and a plurality of internal dogs adapted to be engaged under a shoulder of a can, a radially projecting abutment tang on said annulus body diametrically opposite one of said dogs and said depending legs on the annulus body having inturned corner ends.

5. A locking ring for a cap and container assembly which comprises a flat metal ring, a radial tang projecting outwardly from the ring and providing an abutment, an internal dog diametrically opposite said tang, a plurality of internal dogs in opposed relation to said first mentioned dog to cooperate therewith for retaining the ring under an annular shoulder on a container, and a plurality of depending legs on the ring adapted to bottom on an internal shoulder of a cap.

6. A lock ring which comprises a flat annulus having a plurality of depending spring legs on the outer periphery thereof, a plurality of inwardly projecting dogs on the inner periphery thereof and an abutment tang on the outer periphery thereof in diametrically opposite relation to one of said legs.

7. A locking ring which comprises a flat metal annulus having a radially inward projecting dog on a diameter line thereof, a pair of radially inwardly projecting dogs on a half portion of the ring opposite the first mentioned dog and straddling the diameter line containing the first mentioned dog, a plurality of spring legs depending from the outer periphery of the ring, and an abutment tang projecting radially from the outer periphery of the ring between said legs.

8. A locking ring for securing a cup-shaped cap with an internal shoulder facing the closed end of the cap on a container having a rim inside of the cap with an external shoulder facing the internal shoulder of the cap which comprises a flat resilient annulus adapted to be snapped over said rim of the container and having internal peripheral means engaging the external shoulder of the container, together with circumferentially spaced depending spring legs adapted to engage the internal shoulder of the cap for cooperating with the internal peripheral means to lock the cap onto the container.

9. In combination with a can having an external downwardly facing annular shoulder and a cap on said can having an internal upwardly facing annular shoulder of larger diameter than said can shoulder, a lock ring on said can having a body with an inner peripheral portion engaging said downwardly facing shoulder, circumferentially spaced spring legs around the outer periphery of the body, said legs depending radially outward and axially downward from said outer periphery of the body into abutting engagement with said upwardly facing shoulder of the cap, said cap having an access opening adjacent said lock ring, a puncturable seal covering said access opening, tangs on said cap on opposite sides of said access opening receiving a portion of the lock ring therebetween, and said portion of the lock ring between said tangs being engageable with a prodding implement inserted through the seal and access opening to shift at least a portion of the lock ring off of at least one of said shoulders to permit removal of the cap from the container.

10. The combination of claim 9 wherein the portion of the lock ring between the tangs is a spring leg receiving the prodding implement thereagainst for moving the leg off of the shoulder of the cap to thereby accommodate removal of the cap from the can.

11. The combination of claim 9 wherein the lock ring is a flat metal ring having in addition to the spring legs, a plurality of upwardly projecting legs bottomed on the end wall of the cap.

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