May 12, 1970 W. E. CHEELEY 3,511,402

PILFER-PROOF CONTAINER CLOSURE

Filed Jan. 29, 1968

FIG-1

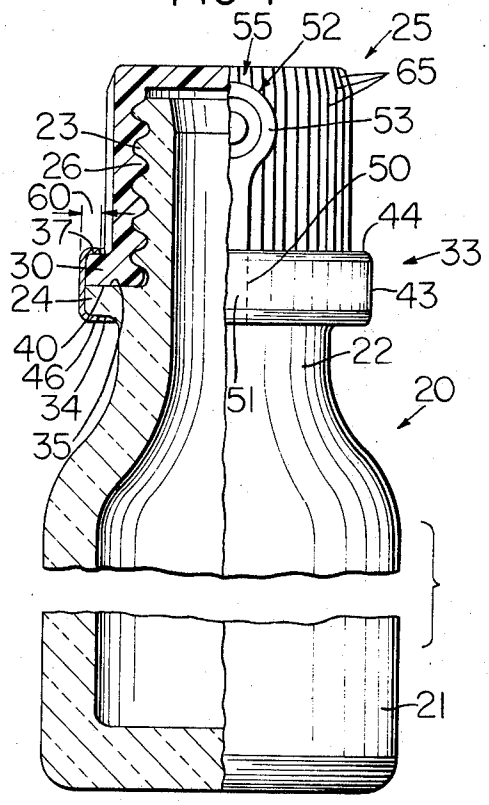


FIG-2

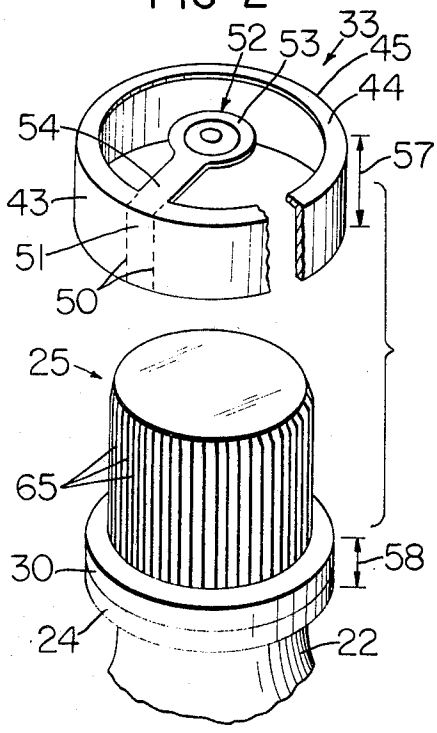


FIG-3

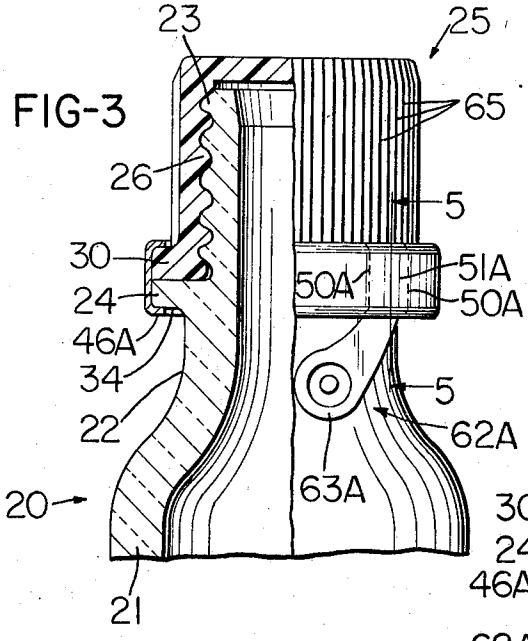


FIG-4

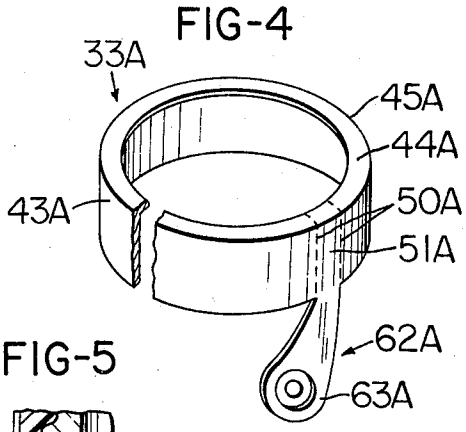
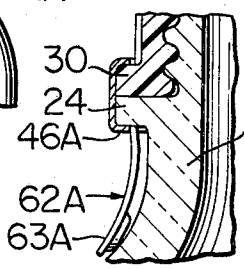


FIG-5



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PILFER-PROOF CONTAINER CLOSURE

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U.S. Cl. 215—43 9 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure relates to a container having a threaded closure cap which is threaded thereon and is held in sealed relation by a sealing band which must be severed and removed from the container to enable removal of the closure cap whereby removal of the sealing band is readily detected and discourages pilfering of the contents of the container.

BACKGROUND OF THE INVENTION

Substantial losses are incurred in many industries, and particularly the pharmaceutical industry, as a result of pilfering from the individual packages which are offered for sale to consumers. Although many so-called tamper-proof closures have been previously proposed, it is possible for a pilferer to open such tamper-proof closures and reclose them in a sufficiently skillful manner to escape easy detection.

SUMMARY

This invention provides an improved pilfer-proof closure for a container which makes it impossible to open such container and reclose it without easy detection of the fact that such container has been opened.

Other details, uses, and advantages of this invention will become apparent as the following description of the embodiments thereof presented in the accompanying drawing proceeds.

BRIEF DESCRIPTION OF THE DRAWING

The accompanying drawing show present preferred embodiments of this invention, in which

FIG. 1 is a view with parts in section and parts broken away illustrating one exemplary embodiment of the improved pilfer-proof closure of this invention;

FIG. 2 is an exploded perspective view with parts in section and parts broken away illustrating the container and closure of FIG. 1 prior to installing a sealing band comprising such closure in position;

FIG. 3 is a view similar to FIG. 1 and illustrating another exemplary embodiment of this invention comprising a modified sealing band used in association with a bottle and closure cap;

FIG. 4 is a perspective view of the sealing band of FIG. 3 with portions thereof broken away and particularly illustrating such sealing band prior to installation thereof in position around the bottle and closure cap of FIG. 3; and

FIG. 5 is a fragmentary sectional view on the line 5—5 of FIG. 3.

DESCRIPTION OF ILLUSTRATED EMBODIMENTS

In the exemplary embodiment of this invention illustrated in FIG. 1 of the drawing a container shown in the form of a glass bottle **20** is illustrated and has a lower substantially right circular cylindrical portion **21** and a comparatively smaller diameter neck **22** which is provided with external threads **23** at the top portion thereof and an outwardly extending annular bead **24** at the bottom of the threads **23**. A closure cap designated generally by the reference numeral **25** is provided and has

cooperating internal threads **26** and an annular outwardly projecting flange **30** at the base of the closure cap **25** which extends circumferentially outwardly of the outer periphery of the closure cap **25**. The bottle **20** is closed by threading the cap **25** in position in a known manner and a sealing band designated generally by the reference numeral **33** is provided and holds the closure cap **25** firmly sealed on the bottle **20**.

The sealing band **33** is fastened in position after the annular flange **30** of cap **25** is tightened snugly against the bead **24**. The construction of the cooperating components comprising the closure of this invention and in particular the construction and arrangement of the sealing band **33** is such that it must be completely severed from the container and removed therefrom to enable removal of the closure cap **25** as will be described in detail subsequently, whereby the improved closure of this invention assures that any unauthorized opening of the bottle **20** may be readily detected by observing the absence of the sealing band **33** from the container **20**. This characteristic of the closure is considered sufficient to reasonably assure that the contents of the bottle **20** will not be pilfered.

The annular bead **24** extending outwardly from the neck **22** of bottle **20** has an annular substantially horizontally arranged planar surface defining its lower surface which is designated by the reference numeral **34**. The bead **24** provided on bottle **20** of this example of the invention also has an annular surface **35** defining its top surface which extends parallel to the bottom surface **34**.

The annular flange **30** comprising the closure cap **25** has a substantially horizontally arranged annular planar surface **37** defining its top surface and an annular planar surface **40** defining its bottom surface which is arranged parallel to planar surface **37**. Upon threading the closure cap **25** on the bottle **20** the bottom surface **40** of closure cap **25** is threaded in sealed relation against the top surface **35** of the annular bead **24** and the top surface **37** and bottom surface **34** of flange **30** and bead **24** respectively are arranged in substantially parallel relation and extend outwardly of the outer periphery of the neck **22** and closure cap **25**. This arrangement enables the sealing band **33** to be easily fastened in position and in a manner as will be described subsequently in this specification.

The sealing band **33** has a substantially right circular cylindrical central portion **43** and an integral top annular portion **44** extending substantially perpendicularly inwardly from the top edge **45** of the central portion **43**. The sealing band **33** also has a bottom annular portion **46** which initially comprises the lower end portion of the right circular cylindrical portion and is formed substantially perpendicularly inwardly against the lower surface **34** of the bead **24** to thereby fix the sealing band **33** in position and require complete severing of such sealing band to enable removal of the closure cap **25** from the bottle **20**.

A pair of weakened lines of separation each designated by the same reference numeral **50** are provided in parallel spaced apart relation in the sealing band **33** and define a tear strip **51** therebetween. The weakened lines of separation extend the full vertical height of the central portion **43** and across the top and bottom annular portions **44** and **46** of the sealing band **33**. Each weakened line of separation **50** may be defined by a suitable score line, or by a plurality of spaced apart slits or cuts suitably arranged end to end in a known manner, or by any other suitable technique.

A pull tab **52** is provided to enable easy severing of the tear strip **51** defined by the weakened lines of separation **50**. The pull tab **52** is provided as an integral part of the

top annular portion **44** and has a larger area circular portion **53** defining its terminal end which enables easy grasping thereof and a base portion **54** which is arranged within the confines of the lines of separations **50**. In this example of the invention the base **54** is substantially equal in width to the distance between the lines of separation **50**.

The sealing band **33** is easily installed in position after first threading the closure cap **25** on the bottle **20** merely by pulling the pull tab **52** so that it is raised to extend against and upwardly along the closure cap **25** as illustrated at **55** in FIG. 1. With the pull tab thus arranged it will be seen that the bottom surface of the top annular portion **44** of the sealing band **33** is resting on the top planar surface **37** of the annular flange **30** comprising the closure cap **25**.

The height of the cylindrical portion of the sealing band **33** prior to forming the bottom annular portion **46** in position is indicated at **57** in FIG. 2 and it will be apparent that the height **57** is substantially greater than the height indicated at **58** defined by the combined thicknesses of the bead **24** and the flange **30**. Thus, it is a simple matter to fix the sealing band **33** in position merely by forming the bottom annular portion **46** in position using any suitable forming means such as a forming roll, or the like.

Once the bottom annular portion **46** is formed in position against the lower surface **34** of the bead **24** it will be seen that the sealing band **33** has a substantially U-shaped cross-sectional configuration. In addition, it will be seen that the outwardly extending parallel legs of the U-shaped cross-sectional configuration are of a substantial length as indicated by the reference numeral at **60** in FIG. 1 whereby the U-shaped configuration further assures that the tear strip **51** defined between the weakened lines of separation **50** must be severed to remove the sealing band **33** and the closure cap **25** from the bottle **20**.

Another exemplary embodiment of this invention is illustrated in FIGS. 3–5 of the drawings which is very similar to the embodiment illustrated in FIGS. 1 and 2. In the embodiment of FIGS. 3–5 the illustrated closure cap and bottle will be given the same reference numerals as in the embodiment of FIGS. 1 and 2. Further, because the sealing band in this latter embodiment is very similar to the sealing band **33** it will be designated generally by the same reference numeral **33** followed by the letter designation A and component parts thereof which are very similar to corresponding parts of sealing band **33** will be designated by the same numerals as before also followed by the letter designation A and not described again in detail. Only those component parts of sealing band **33A** which are different will be designated by a new reference numeral also followed by the letter designation A and described in detail.

The sealing band **33A** has a pull tab **62A** which is formed as an integral part of the bottom annular flange portion **46A**. Pull tab **62A** has an increased area portion **63A** defining its terminal end which enables easy grasping and pulling thereof to sever tear strip **51A** from the sealing band **33A** and enable bottle **20** to be opened.

As will be apparent from FIGS. 3 and 5 of the drawing the bottom annular portion **46A** of sealing band **33A** is formed in position against the lower annular surface **34** of bead **24** in a similar manner as previously described in connection with the embodiment of this invention illustrated in FIG. 1 and 2. However, upon forming the bottom annular portion **46A** in position it will be seen that the pull tab **62A** is formed to extend against and downwardly along the bottle **20** and in particular along its neck portion **22** so that the pull tab is arranged in a substantially protected position beneath the bead **24**.

The sealing band **33A** is severed essentially in a similar manner as sealing band **33**; however, in the case of sealing band **33A** the pull tab **62A** is grasped and pulled upwardly thereby severing the tear strip **51A** from between the spaced apart parallel lines of separation **50A**. The sealing band **33A** is then removed from around the neck **22** of the bottle **20** thereby enabling the closure cap **25** to be removed for access to contents of the bottle **20**.

In both embodiments of this invention illustrated in the drawing it will be seen that each sealing band is formed in position so that it has a substantially U-shaped cross-sectional configuration and each parallel leg portion engages an area of substantial size. The construction and arrangement of the cooperating components is such that the cap **25** cannot be unthreaded or unscrewed except by removing the sealing band by first tearing out the tear strip provided therein. In addition, the severing action is such that in each instance it would be practically impossible to sever the strip and then refasten it in position so that it could not be noticed that the bottle **20** had been opened, particularly because it would be necessary to reconstruct the configuration of the tear strip as well as attempt to fasten it in position along both of its severed edges, whereby it will be appreciated that the net effect is to discourage any pilfering of the contents of bottle **20**.

The closure cap **25** in each instance may be made of any suitable material such as a phenolic plastic material which is provided with a plurality of spaced apart ridges a representative few of which have been designated by the reference numeral **65** to enable easy grasping and twisting thereof. The spaced apart ridges **65** provided on cap **25** are preferably made so that they extend vertically and offer an easily gripped non-skid substantially cylindrical surface.

The bottle **20** is shown in the drawing as being made of a glass material; however, it will be appreciated that each bottle **20** may be made of any suitable material and that the neck portion thereof need not necessarily be of a smaller diameter than the main central portion **21** but may be substantially coextensive in diameter therewith, if desired.

Each of the sealing bands **33** and **33A** may be made of any suitable material such as a metallic material containing aluminum, for example. Further, it is preferred that the characteristics of the material utilized should assure that any attempt to unfasten the top or bottom annular porion of the particular sealing band as by an outward prying action, or the like, will result in an easily observed fracturing or breaking of the particular top or bottom annular portion of the sealing band and thereby preclude pilfering by making it difficult for the pilfering to be unnoticed. Also, in those applications wherein a metal is utilized to make a particular sealing band, the thickness of the metal, its hardness, its temper, and any tendency for the metal to work harden during manufacture or installation of the sealing band are among the characteristics thereof which are considered in providing a sealing band which will readily fracture in the event pilfering is attempted.

Thus, it will be seen that the closure of this invention may only be effectively opened by severing away the tear strip provided on the particular sealing band and removal of the band from the bottle. Because the absence of the sealing band is easily detected at a glance pilfering is discouraged.

While present exemplary embodiments of this invention, have been illustrated and described, it will be recognized that this invention may be otherwise variously embodied and practiced by those skilled in the art.

What is claimed is:

1. In combination: a container having a neck provided with external threads at the top portion thereof and an annular bead at the bottom of said threads said bead having a horizontally arranged annular bottom surface, a preformed internally threaded closure cap for said container threaded over said external threads and having an annular outwardly projecting flange at the base thereof which engages said annular bead, said flange having an annular top surface arranged parallel to said bottom surface of said bead, and a sealing band holding said flange

against said bead, said sealing band comprising, a cylindrical portion, a preformed integral top annular portion extending perpendicularly inwardly from the top edge of said cylindrical portion, a bottom annular portion initially comprising the lower end portion of said cylindrical portion and being formed perpendicularly inwardly against said horizontally arranged annular bottom surface of said bead to define said sealing band having a U-shaped cross-sectional configuration and simultaneously fix said sealing band in position and require complete severing thereof to enable removal of said cap, a pair of weakened lines of separation extending in spaced apart relation the full vertical height of said cylindrical portion and completely across each of said top and bottom annular portions, said lines of separation defining a tear strip in said band which must be completely severed from said container to enable removal of said closure cap, and a pull tab fastened to one end portion of said tear strip to enable severing thereof, said annular portions of said sealing band being of substantial length and being both arranged horizontally, said annular portions having inner edges which are practically inaccessible for outward prying making it necessary to sever said band to enable removal of said closure cap whereby the opening of said container may be readily detected by the absence of said sealing band to thereby discourage any pilfering of its contents.

2. A combination as set forth in claim 1 in which said pull tab is provided as an integral part of said bottom annular portion, has a base which is arranged within the confines of said pair of lines of separation, and is formed to extend against and downwardly along said container upon forming said bottom annular portion against the lower surface of said bead.

3. A combination as set forth in claim 1 in which said container comprises a bottle having a comparatively smaller diameter neck and said sealing band is made of a metallic material.

4. A combination as set forth in claim 3 in which said weakened lines of separation extend in parallel relation across said cylindrical portion and across each of said bottom and top annular portions, and said pull tab is provided as an integral part of said top annular portion, has a base which is arranged between and is substantially equnal in width with the distance between said lines of separation, and is raised to extend against and upwardly along said closure cap upon fastening said sealing band in position.

5. A combination as set forth in claim 3 in which said weakened lines of separation extend in parallel relation across said cylindrical portion and across each of said top and bottom annular portions, and said pull tab is provided as an integral part of said bottom annular portion, has a base which is arranged between and is substantially equal in width with the distance between said lines of separation and is formed to extend against and downwardly along said bottom annular portion against the lower surface of said bead.

6. A combination as set forth in claim 1 in which, said container comprises a bottle having a comparatively smaller diameter neck, said closure cap has a plurality of spaced apart vertically extending ridges which enable easy grasping and twisting thereof, and said sealing band is made of a metallic material, said metallic material being of sufficient hardness to assure that any attempt to unfasten either of said annular portions by an outward prying action will result in an easily observed breakage thereof.

7. A combination as set forth in claim 6 in which said pull tap is provided as an integral part of said bottom annular portion against the lower surface of said downwardly along said container upon forming said bottom annular portion against the lower surface of said bead.

8. In combination: a container having a neck provided with external threads at the top portion thereof and an annular bead at the bottom of said threads said bead having a substantially horizontally arranged annular bottom surface, a preformed internally threaded closure cap for said container threaded over said external threads and having an annular outwardly projecting flange at the base thereof which engages said annular bead, said flange having an annular top surface arranged parallel to said bottom surface of said bead, and a sealing band holding said flange against said bead, said sealing band comprising, a cylindrical portion, a preformed integral top annular portion extending substantially perpendicularly inwardly from the top edge of said cylindrical portion, a bottom annular portion initially comprising the lower end portion of said cylindrical portion and being formed substantially perpendicularly inwardly against said horizontally arranged annular bottom surface of said bead to define said sealing band having a substantially U-shaped cross-sectional configuration and simultaneously fix said sealing band in position and require complete severing thereof to enable removal of said cap, a pair of weakened lines of separation extending in spaced apart relation the full vertical height of said cylindrical portion and completely across each of said top and bottom annular portions, said lines of separation defining a tear strip in said band which must be completely severed from said container to enable removal of said closure cap, and a pull tab fastened to one end portion of said tear strip to enable severing thereof, said pull tab being provided as an integral part of said top annular portion, having a base which is arranged within the confines of said pair of lines of separation, and being raised to extend against and upwardly along said closure cap upon fastening said sealing band in position so that the terminal end of said pull tab is arranged beneath the top surface of said closure cap, said preformed top annular portion of said sealing band being of substantial length to assure said band must be severed to enable removal of said closure cap yet having an inner substantially circular edge which enables easy installation of said preformed top annular portion of said sealing band against said flange, whereby the opening of said container may be readily detected by the absence of said sealing band to thereby discourage any pilfering of its contents.

9. In combination: a bottle having a comparatively small diameter neck provided with external threads at the top portion thereof and an annular bead at the bottom of said threads said bead having a substantially horizontally arranged annular bottom surface, a preformed internally threaded closure cap for said bottle threaded over said external threads, said closure cap having an annular outwardly projecting flange at the base thereof which engages said annular bead and having a plurality of spaced apart vertically extending ridges which enable easy grasping and twisting thereof, said flange having an annular top surface arranged parallel to said bottom surface of said bead, and a sealing band holding said flange against said bead, said sealing band comprising, a cylindrical portion, a preformed integral top annular portion extending substantially perpendicularly inwardly from the top edge of said cylindrical portion, a bottom annular portion initially comprising the lower end portion of said cylindrical portion and being formed substantially perpendicularly inwardly against said horizontally arranged annular bottom surface of said bead to define said sealing band having a substantially U-shaped cross-sectional configuration and simultaneously fix said sealing band in position and require complete severing thereof to enable removal of said cap, a pair of weakened lines of separation extending in spaced apart relation the full vertical height of said cylindrical portion and completely across each of said top and bottom annular portions, said lines of separation defining a tear strip in said band which must be completely severed from said container to enable removal of said closure cap, and a pull tab fastened to one end portion of said tear strip to enable severing thereof, said preformed top annular portion of said sealing band being of substantial

length to assure said band must be severed to enable removal of said closure cap yet having an inner substantially circular edge which enables easy installation of said preformed top annular portion of said sealing band against said flange, said sealing band being made of a metallic material which is of sufficient hardness to assure that any attempt to unfasten either of said annular portions by an outward prying action will result in an easily observed breakage thereof, said pull tab being provided as an integral part of said top annular portion and being raised to extend against and upwardly along said closure cap upon fastening said sealing band in position so that the terminal end of said pull tab is arranged beneath the top surface of said closure cap, whereby the opening of said bottle may be readily detected by the absence of said sealing band to thereby discourage any pilfering of its contents.

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