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CLOSURE CAP FOR RECEPTACLES

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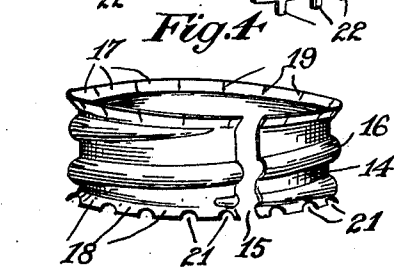
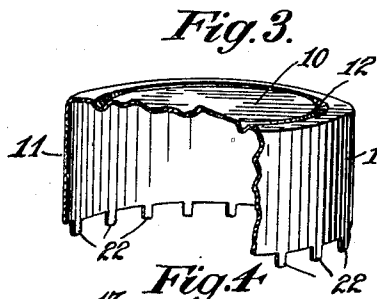
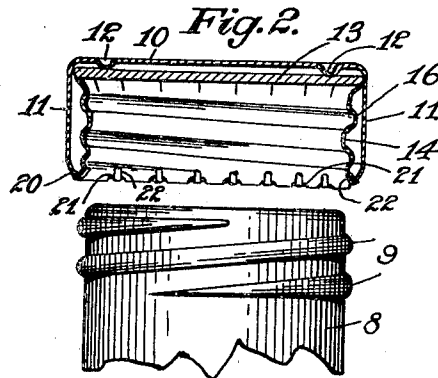
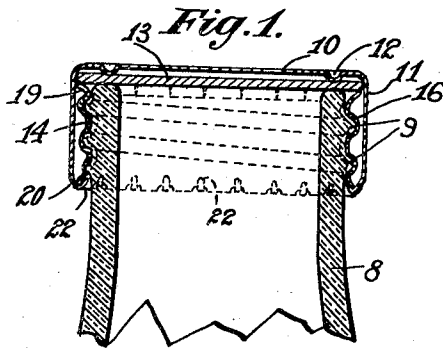
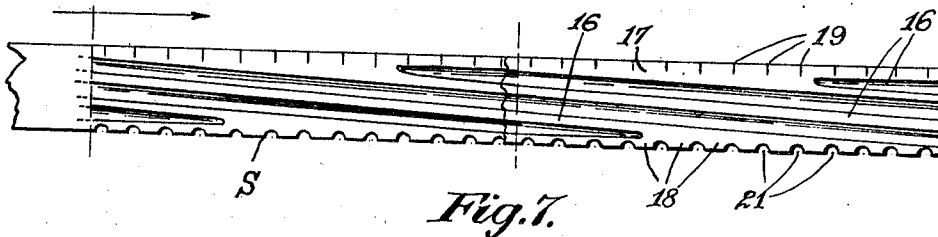
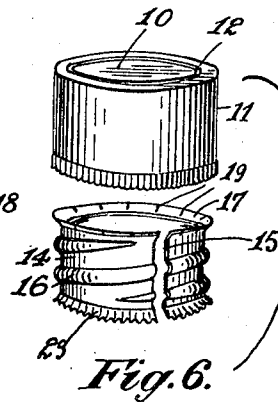
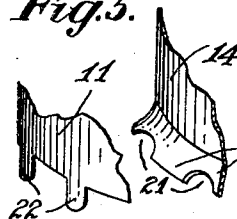


Fig. 5.



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CLOSURE CAP FOR RECEPTACLES

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This invention relates to closure caps for receptacles, such as bottles, vials, jars, and the like, having an open mouth provided with an external locking device, such as a screw thread, and relates particularly to a two part closure cap.

Closure caps of this character consist of a drawn cup member having a smooth skirt and nesting and concealing with said cup member another drawn cup member the skirt of which is provided with a locking device, such as a screw thread rolled into the cup skirt and corresponding with a locking device of the receptacle to co-operate therewith in applying the closure cap to the receptacle to draw and secure the closure cap to the receptacle neck. Caps of this character are made of relatively rigid metal and the screw threading of the skirt of the inner cup member reinforces and increases the rigidity of the metal thereof. In addition to threading the edge of the skirt is provided with a bead, usually termed a wire edge, which renders the cup skirt so rigid that it is impossible to reform the same under hand pressure. It is practically impossible in the manufacture of receptacles of glass to produce receptacles with threaded necks of uniform and the same diameter due to the expansion or contraction of the heated or molten glass. This irregularity or variation in the diameter of the neck or thread thereon of successively produced receptacles is so serious that it is impossible to apply such a drawn and threaded cup member onto the larger expanded receptacle necks or thread thereon since the cup member is of a rigid structure and fixed diameter resulting in great loss of time and material in trying on closure caps and the discarding of receptacles the threaded necks of which have expanded beyond certain fixed dimensions, and when applying the closure caps to filled receptacles by mechanical means frequently resulting in the breaking of the receptacle and consequent loss of the contents thereof.

It is the principal object of the present invention to produce an improved constructed and arranged two part closure cap for receptacles, such as bottles, vials, jars and the like, comprising an outer cup member and a member concealed within the outer cup member provided with a locking device or screw thread to co-operate with the locking device or screw thread on the receptacle neck to firmly draw and lock the closure member to the receptacle and adapt itself to irregularities and variations in the diameter of the receptacle neck or the thread thereon, and to provide the closure cap members with portions adapted to interlock to anchor the inner member within the outer member to prevent movement of the parts relative to each other and assure applying and removing forces applied to the outer member of the closure cap being trans-

mitted to the inner member and the firm and rigid locking of the closure cap to the receptacle.

It is another object of the invention to produce an improved constructed closure cap of this character for receptacles comprising a cup member having a smooth skirt and an expansible annular or ring member arranged and concealed within the cup member and provided with a locking device or screw thread adapted to be reformed to accommodate it to irregularities or variations in the bottle neck or the thread thereon in applying the closure cap thereto.

A further object of the invention is to produce an improved constructed closure cap of this character for receptacles, comprising a cup member having a smooth skirt, and a split annular or ring member or band formed and severed from a web or strip and coiled to annular form and provided with a locking device or screw thread to co-operate with the locking device or screw thread on the receptacle neck to draw and rigidly lock the closure cap to the receptacle neck with the disk portion of the closure cap in firm engagement with the end wall of the receptacle neck, said band when arranged to annular form being of less diameter than the skirt of the cup member to permit of expansion of the annular member, and the cap members having parts to interlock to anchor the inner member within the outer member to positively transmit to the inner member the securing force applied to the cup member and assure a rigid locking of the closure cap to the receptacle.

Other objects and advantages will hereinafter appear.

In the drawing accompanying and forming a part of this application Figure 1 is a sectional view of the mouth end of a receptacle and an embodiment of my improved constructed closure cap applied thereto.

Figure 2 is a view similar to Figure 1 but showing the closure cap disassembled from the receptacle neck and about to be applied thereto.

Figure 3 is a perspective view, partly in section, of the outer cap member of my improved closure cap.

Figure 4 is a perspective view of the inner or locking member of the closure cap.

Figure 5 is a view in perspective of portions of the outer cap member and inner locking member in disassembled relation to show the interlocking means of said members to anchor the inner member to the cap member.

Figure 6 is a perspective view of the members of the closure cap in disassembled relation and showing the same arranged with modified interlocking means to anchor the inner member to the outer cap member; and

Figure 7 is a plan view of a strip or web of material from which the inner locking member is

formed and showing the manner of forming the web and severing blanks therefrom from which said inner locking member is constructed.

The closure member is particularly adapted for use with receptacles 8, such as bottles, vials, jars, and the like made of glass, although it may be used with receptacles of other materials, such as porcelain or metal. In the embodiment illustrated the closure cap is shown in connection with a glass bottle having a locking device or shoulder on the exterior of the neck, shown in the form of a continuous screw thread 9, although it may comprise a plurality of screw thread sections, only so much of the receptacle being shown as is essential to an understanding of the invention.

In the embodiment of my improved closure cap illustrated for carrying out the invention there is provided a member 10 of cup or cap form drawn from a blank, the flange or skirt 11 of which member in the preferred form is smooth so that it will readily lend itself for surface decoration, and the disk portion may have an inwardly extended bead 12 positioned within the juncture of said disk portion with the skirt to be in opposed relation to the edge or end wall of the mouth of the receptacle 9 to impinge against and firmly seat a liner or sealing pad 13 to said end wall of the receptacle mouth.

The flange 11 is of increased diameter relative to the diameter of the threaded bottle neck, and there is arranged within the cap member a circumferentially expansible and contractile band or ring member 14, transversely split, as at 15. The ring member is formed to a predetermined diameter slightly less than the diameter of the bottle neck to which the closure cap is to be applied and less diameter than the diameter of the cap skirt 11 and of a width somewhat less than the depth of the cap skirt. The ring member is provided with a locking device or shoulder, such as thread engaging means to co-operate with the locking device or screw thread 9 on the bottle neck, and shown as a screw thread 16. The opposite marginal end portions of the ring member are flared outwardly, as at 17, 18, which portions are adapted to loosely engage the cap skirt to support and maintain the body portion of the ring member in spaced relation to the cap skirt. The flaring end portion 17 engages with and serves to support and retain the liner or sealing pad 13 within the cap member 10. To add resiliency to said flaring portion to permit of the ready expansion and contraction of the ring member it is provided with a plurality of circumferentially spaced slits 19 cut inwardly from the edge to substantially the width of the flaring portion.

To retain the ring member within the cap member the marginal portion of the cap skirt is turned inwardly over the flaring end portion of the ring member, as at 20. To anchor and prevent rotation of the ring member relative to the cap member and whereby the force to rotate the closure cap in applying it to the receptacle will be transmitted to the locking member and assure the drawing and firmly seating of the disk portion of the cap member and thereby the sealing pad to the edge or end wall of the receptacle neck portions of the cap and ring members are interlocked. This may be variably effected, and as shown in Figures 1 to 5 the flaring end portion 18 of the ring member 14 is provided with a series of notches 21 circumferentially disposed about and cut into the edge of said flaring ring portion, for the engagement of ribs or lips 22 arranged on and extending from the rim of the cup skirt, said ribs being of less

width than the notches 21 to permit of the expanding and contracting movements of the ring member.

In the Figure 6 construction there is shown a modification of the interlocking means of the cap members and consisting of corrugating or fluting the flaring portion 18, as at 23, with which corresponding corrugations or flutes of the marginal portion of the rim of the cup skirt are interengaged when said marginal skirt portion is turned inward over the flared end of the ring member arranged with the corrugations 23.

In the method of constructing the band or ring member 14 there is provided a flat strip or web S (Figure 7,) whereby said band may be economically constructed without waste of material. The web is drawn from a rotatably supported roll of the web and formed with flutes or ribs to constitute the locking shoulder or thread engaging means 16 and the opposite longitudinal marginal portions are bent laterally to constitute the flaring portions 17, 18 of the ring member, said flaring portions preferably prior to bending them laterally being provided with the slits 19 and notches 21. Blanks of a length equal to the predetermined diameter of the ring members or bands to be formed are then severed from the strip and coiled or rolled to circular form.

As stated the band 14 is formed to a diameter which is slightly less than the predetermined diameter of the threaded receptacle neck to which it is to be applied and of less diameter than the diameter of the cup skirt 11 whereby it will normally be spaced from the skirt, as shown in Figure 2. The end wall of the receptacle neck is so shaped that the leading end portion of the locking shoulder or thread engaging means will engage thereon and as the cup is rotated the ring member or band will expand and accommodate itself to the shape and diameter of the bottle neck and thread thereon, the band being expanded from the dotted line position to the full line position shown in Figure 1. In the event the receptacle is made of glass and the neck or the thread thereon has expanded beyond its predetermined diameter due to expansion or contraction in the cooling of the heated or molten glass the split ring member will reform itself under the force and without any appreciable effort in applying it to the receptacle. In the expansion of the band or ring member over an oversize receptacle neck there is also effected an elongation of said ring member, which is compensated for by the yielding of the slitted flaring end 17.

Having thus described my invention, I claim:

1. In a closure cap for receptacles, a cup member having a skirt, a split ring member engaged within the cup member of a normal diameter less than the diameter of and concealed by the cup skirt and having the opposite marginal portions flared outwardly, one of said flaring marginal portions having circumferentially spaced slits cut inward from the edge and the opposite flaring marginal portion arranged with circumferentially spaced notches in the edge, and said ring member having a shoulder formed therein to co-operate with a locking shoulder on the receptacle, and ribs extended from the rim of the cup skirt adapted to be interlocked with the notches in the one flaring marginal portion of the ring member to anchor the ring member to the cup member and permit of circumferential expansion and contraction thereof.

2. In a closure cap for receptacles, a cup member having a skirt, a split ring member of a width 75

slightly less than the depth of the skirt and of a normal diameter less than the diameter of the cup skirt engaged in the cup member, said ring member provided with thread engaging means and the opposite marginal portions flared outwardly with the one flaring portion juxtaposed to the disk portion of the cup member having circumferentially spaced slits cut inward from the edge, a liner interposed between the disk portion of the cup member and the slitted flaring marginal portion of the ring member, and the rim portion of the cup skirt interlocked with the juxtaposed flaring marginal portion of the ring member to anchor the ring member to the cup member and permit of expansion and contraction thereof.

3. A closure cap for receptacles having a neck with an exterior locking shoulder, comprising a cup member having a skirt of a diameter greater than the diameter of the receptacle neck to which the closure is to be applied, and a band formed from a flat strip of resilient material engaged within the cup member adapted to be circumferentially contracted and expanded against the inherent tension of the material thereof, said band having a width slightly less than the depth of the cup skirt with the opposite marginal portions flared outwardly to engage the cup skirt and the portion intermediate said flared marginal portions having a normal diameter less than the cup skirt and substantially the same as the outer diameter of the receptacle neck to which the closure cap is to be applied and formed with a locking shoulder to co-operate with the shoulder on the receptacle neck to lock the closure cap thereto, and the rim of the cup skirt turned inward and upward and anchored to the outer flared marginal portion of the band to transmit rotary movement of the cup member to said band in engaging the locking shoulder thereof with the locking shoulder on the receptacle neck to firmly draw the closure cap to the receptacle neck and permit expansion and conforming of said band to the receptacle neck and locking shoulder thereon in applying the closure cap to the receptacle.

4. A closure cap for receptacles having a neck with an exterior locking shoulder, comprising a cup member having a skirt of a diameter greater than the diameter of the receptacle neck, a band formed from a flat strip of resilient material engaged within the cup member adapted to be circumferentially contracted and expanded against the inherent tension of the material thereof, said band having a width less than the depth of the cup skirt and formed to a normal diameter less than the diameter of the cup skirt and substantially equal to the outer diameter of the receptacle neck, said band having a locking shoulder formed therein adapted to co-operate with the locking shoulder on the receptacle to lock the closure cap thereto and notches in the outer edge, and the rim of the cup skirt turned inward over the outer edge portion of the band, and portions thereof interlocked with the band notches to anchor the band to the cup member with the body of the band spaced from the skirt of the cup member to prevent rotary movement of the cup member relative to the band in engaging the locking shoulder thereon with the locking shoulder on the receptacle neck and permit of expansion of the band to conform with the receptacle neck and locking shoulder.

5. A closure cap for receptacles having a neck with an exterior locking shoulder, comprising a

cup member having a skirt of a diameter greater than the receptacle neck to which it is to be applied, and a band formed from a flat strip of resilient material engaged within the cup member having a normal diameter less than the diameter of the cup skirt and adapted to be circumferentially contracted and expanded against the inherent tension thereof and conformed to the neck of a receptacle when engaged thereon, said band being anchored to the cup skirt to permit of circumferential expansion and contraction of the ring member within the cup member, and having a locking shoulder formed therein to co-operate with the locking shoulder on the receptacle to lock the closure cap to the receptacle and adapted to conform itself to irregularities in the locking shoulder on the receptacle neck.

6. A closure cap for receptacles having a neck with an exterior locking shoulder, comprising a cup member having a skirt of greater diameter than the receptacle neck to which it is to be applied, and a band formed from a flat strip of resilient material engaged within the cup member formed to a normal diameter less than the internal diameter of the cup member and substantially equal to the outer diameter of the receptacle neck, and said band concealed by the cup skirt and having notches spaced about the outer edges and a locking shoulder formed in the material thereof to co-operate with the locking shoulder on the receptacle neck to lock the closure member thereto, and the rim of the cup skirt turned inward over the notched edge of the band and having ribs extended therefrom to engage the notches in the ring member to anchor the band to the cup member and permit of circumferential expansion and contraction of the band.

7. In a screw closure cap for receptacles, a cup member having a top and a smooth skirt, and an inner member comprising a split band provided with thread engaging means, the body of the inner member being of less diameter than that of the cup member and normally spaced therefrom, the split band and the spacing permitting the inner member to be expanded and contracted, and means for locking the inner member and the cup member together.

8. In a screw closure cap for receptacles, a cup member having a top and a smooth skirt, and an inner member comprising a split band provided with thread engaging means, the body of the inner member being of less diameter than that of the cup member and normally spaced therefrom, the split band and the spacing permitting the inner member to be expanded and contracted, the lower portion of the inner member being outwardly flared, and means for locking the cup member to said outwardly flared portion of the inner member.

9. In a screw closure cap for receptacles, a cup member having a top and a smooth skirt, and an inner member comprising a split band provided with thread engaging means, the body of the inner member being of less diameter than that of the cup member and normally spaced therefrom, the split band and the spacing permitting the inner member to be expanded and contracted, a liner supported between the upper end of the inner member and the top of the cup member, and means for locking the inner member and the cup member together.

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