

March 17, 1964

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3,125,237

CONTAINER AND CLOSURE THEREFOR

Filed April 23, 1962

2 Sheets-Sheet 1

Fig. 1.

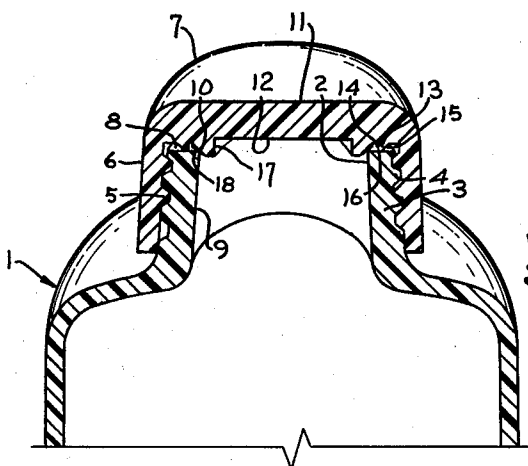


Fig. 2.

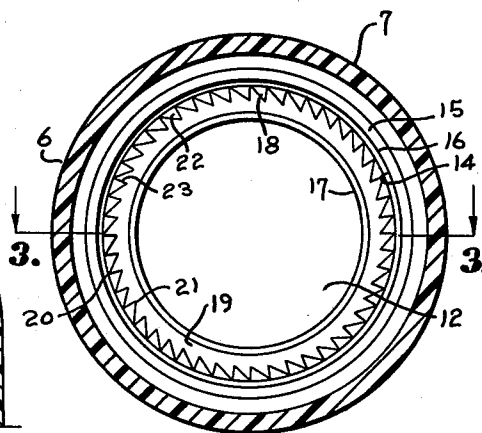


Fig. 4.

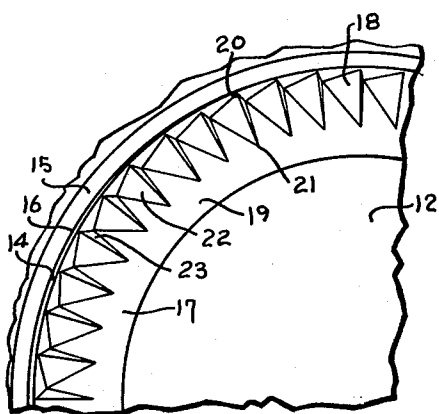


Fig. 3.

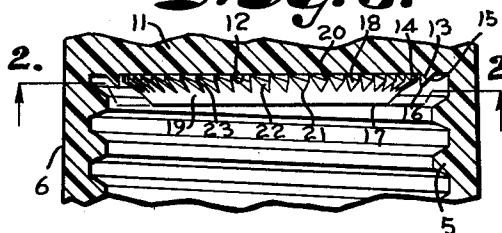


Fig. 5.

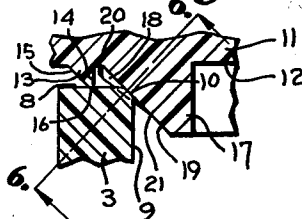
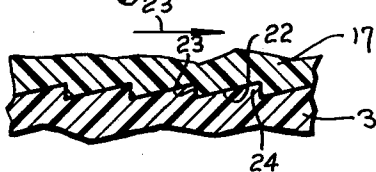


Fig. 6.



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2 Sheets-Sheet 2

Fig. 7.

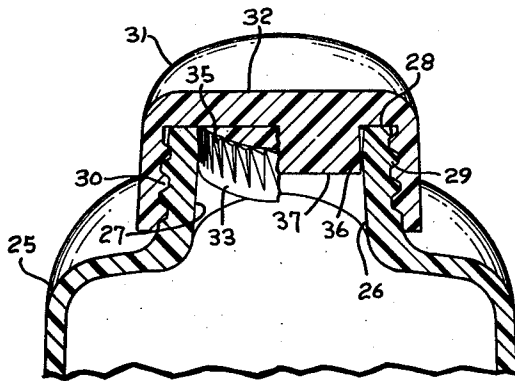


Fig. 8.

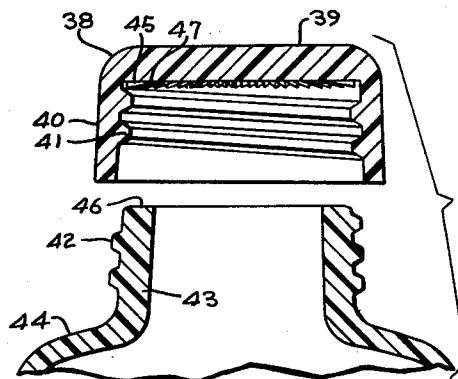


Fig. 9.

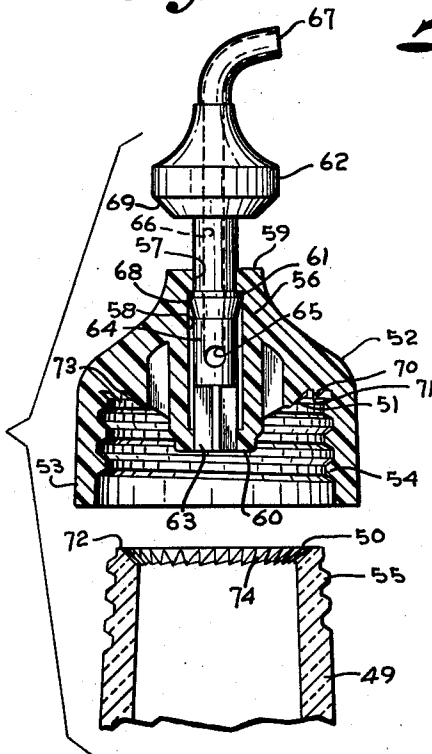


Fig. 10.

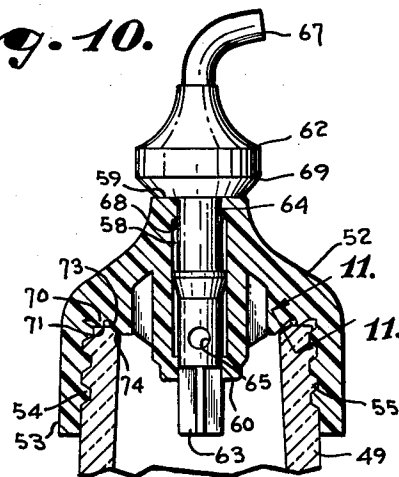
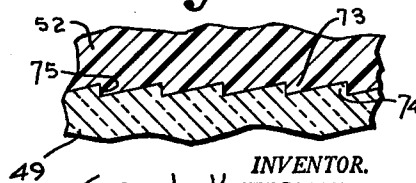


Fig. 11.



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CONTAINER AND CLOSURE THEREFOR

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15 Claims. (Cl. 215-43)

This invention relates to containers and closures therefor, and more particularly to a structure wherein the closure is threaded onto the container and forms an interlocking relationship that resists removal of the closure to thereby provide a safety structure wherein accidental loosening of the closure is substantially prevented.

More specifically, this invention is concerned with containers and closures wherein the closure is made in the form of a cap or the like of material such as polyethylene, polypropylene or other suitable materials including natural and synthetic rubbers having flexible and resilient characteristics whereby it will seal against the container without the use of sealing inserts or liners and yet have sufficient rigidity and strength to maintain its shape and have screw threads that will serve to tighten the closure in place for the sealing engagement. It will be understood that the container and closure have cooperating portions and that such a closure of materials having flexible and resilient characteristics may be used on containers of similar materials, as well as containers of rigid materials such as glass. It is preferred that the material of the closure also be characterized by being substantially odorless, dense and have a low coefficient of friction with the material of the container whereby the contacting parts will slide one on the other in applying the closure to the container.

In the packaging of many liquids in bottles and other containers, it is desirable that the closure be secured in a tightly sealed relation to the container and remain in such relation until it is desired to open same. Threaded caps or closures molded in conventional shapes from synthetic resins such as polyethylene and the like have not been satisfactory, particularly where the liquid in the container is oil, liquid soap or other detergents or bleaches and the like. It has been found that in such instances, after the container is filled and the closure is screwed tightly in place, there apparently is a loosening action that occurs during shipping and handling with the result that leakage of the liquid is permitted. Such leakage presents a hazard with corrosive or otherwise dangerous liquids, and also such leakage can result in insufficient quantity being in the container when it is sold to a consumer and complaints therefrom. It is believed that the loosening of the closure on the container, particularly where the closure is screwed onto a container having liquids therein which will provide a wetting action, is due partially to the resiliency of the material of the closure whereby the force of the tightening of the closure to effect the seal is applied to the closure in a manner to tend to effect a rotation that will loosen the closure on the container. In other words, the closure has a tendency to be self-turning or loosening on the container.

The principal objects of the present invention are to provide a container and closure structure with cooperating portions that will eliminate the self-loosening characteristic of closures of resilient flexible material and thereby the disadvantages heretofore experienced therewith; to provide a container and closure therefor wherein the closure is molded from a resilient flexible material and having portions adapted to effect an interlocking engagement with the container when screwed thereon into closing sealed position; to provide a container and closure structure with engaging portions with substantially line contact therearound to effect a seal with a minimum of pressure therebetween; to provide such a structure with serrations at

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the seal arranged for deformation forming an interlocking engagement adjacent thereto to resist retrograde screwing of the cap from the container; to provide such a structure wherein the serrations each have inclined portions terminating in shoulders facing rearwardly relative to the direction of rotation of the closure in the screwing thereof onto the container whereby the resiliency of the material will permit the closure to be screwed into tight closing position and then effect an engagement of the serrations with the container to substantially resist retrograde screwing of the cap from the container; to provide such a structure wherein the container is formed of flexible resilient material and the serrations on the closure effect a deformation or cold flow to form an interlocking engagement that will eliminate any tendency of self-loosening; to provide such a structure with a supplemental sealing ridge-like portion adapted to engage the container with a relatively narrow area of contact for sealing deformation of the ridge with a minimum of pressure; to provide such a container closure of resilient flexible molded synthetic resin with a dispensing valve slidable in a bore thereof and resiliently engaged thereby to form a fluid-tight seal with said valve when in closed position; and to provide a container and closure structure of resilient flexible material that eliminates self-loosening action and that is economical to manufacture, easily applied and is efficient in providing a positive safety structure that will remain closed and sealed until the closure is manually screwed from the container.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings wherein are set forth by way of illustration and example certain embodiments of this invention.

FIG. 1 is a partial perspective sectional view through a container and closure embodying the features of the present invention.

FIG. 2 is an enlarged transverse sectional view through the closure taken on the line 2-2, FIG. 3.

FIG. 3 is an enlarged partial sectional view through the closure taken on the line 3-3, FIG. 2.

FIG. 4 is a further enlarged partial bottom view of the closure particularly illustrating the arrangements of the serrations thereon.

FIG. 5 is an enlarged partial sectional view through the sealingly engaging portions of the closure and container.

FIG. 6 is an enlarged sectional view through the interlocking portions of the closure and container taken on the line 6-6, FIG. 5.

FIG. 7 is a perspective sectional view through a modified form of container and closure wherein the interlock by the serrations is on the interior of a container neck.

FIG. 8 is a partial sectional view through a container and a closure in separated relation with the serrations adapted to engage the end face of the container neck.

FIG. 9 is a partial sectional view through a container and dispenser type closure in spaced relation wherein the serrations are arranged in cooperative relationship on corresponding surfaces.

FIG. 10 is a sectional view through the form of the invention illustrated in FIG. 9 with the parts in assembled relation and the dispenser valve in closed position.

FIG. 11 is an enlarged sectional view through the interlocking portions of the seal taken on the line 11-11, FIG. 10.

Referring more in detail to the drawings:

The reference numeral 1 designates a container having a dispensing opening 2 defined by a wall 3 having screw threads 4 on the external surface thereof adapted to be engaged by screw threads 5 on an internal surface of a skirt 6 of a closure structure 7. In the structure illus-

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trated, the container is arranged whereby the wall 3 is a neck portion thereof whereby the container 1 is in the form of a bottle or the like. In the structure illustrated in FIGS. 1 to 6 inclusive, the container 1 and closure or cap 7 are preferably formed of a material such as polyethylene, polypropylene or other suitable materials including natural and synthetic rubbers having flexible and resilient characteristics as above-noted, it being preferred that the material of the closure be such that it may be constructed by molding, as for example, injection molding. In the structure illustrated, the neck wall 3 has a substantially flat end surface 8 and an inner surface 9 which intersect in a substantially right-angle edge 10 extending around the opening 2.

The closure 7 has a top wall 11 having an inner surface 12 and preferably has a depending ridge 13 extending continuously in a circle around the inner surface of the wall 11, said ridge having faces 14 and 15 converging downwardly from the wall 11 and terminating in an apex 16 adapted to engage the end surface 8 of the container neck wall 3 in sealing engagement therewith when the closure is screwed onto the container to effect a sealed closure thereof. The narrow configuration of the ridge at the apex is such that suitable sealing deformation thereof is obtained with relatively low axial pressure between the container and closure. The closure 7 has a depending portion 17 on the wall 11 provided with a plurality of circumferentially spaced teeth or serrations 18 adapted to engage a cooperating portion of the container or neck to form an interlocking engagement and also provide a seal for the container.

In the structure illustrated in FIGS. 1 to 6 inclusive, the portion 17 is a circular ring-like portion of suitable length to extend into the opening 2 of the neck with the outer periphery of the ring portion adjacent the wall 11 being of greater diameter than the opening 2. The outer peripheral surface 19 is inclined inwardly and downwardly to form a frusto-conical surface adapted to engage the edge 10 of the neck. The serrations 18 extend from the surface 19 and have their greatest altitude as at 20 adjacent the wall 11, said serrations tapering inwardly and merging with the surface 19 inwardly of the neck wall as at 21 whereby said serrations will engage the edge 10 of the neck. The serrations each are arranged with inclined faces 22 that terminate in end faces or shoulders 23 facing rearwardly relative to the direction or path of movement of the serrations as the closure is screwed onto the container, said direction being indicated by the arrow 23', FIG. 6. The inclination of the faces 22 of the serrations and the resiliency of the material of the closure are such that there is a deformation of the serrations at the areas of contact with the portions of the neck adjacent the edge 10 thereof whereby as the closure is screwed onto the neck into sealed position the resilient material of the neck engages the face with a cold flow to form a seal. When force is applied to the closure to tend to effect reverse rotation thereof, as in tending to unscrew the closure from the container, the cold flow of the edge portion 10 of the neck has formed serrations 24 therein mating with the engaged portions of the serrations of the closure, as illustrated in FIG. 6, to form an interlock that provides substantial resistance to unscrewing of the closure and preventing any self-turning action of the closure on the bottle neck under any vibration or handling of the container. However, the closure can be removed by applying substantial force thereto to manually overcome the interlocking effect of the serrations and the cold flow engaged portions of the neck therewith whereby the closure can be removed from the container.

In the structure illustrated in FIGS. 1 to 6 inclusive, there is an effective seal between the faces of the serrations 18 and the edge portion 10 of the container neck and, for more positive assurance of a seal, the ridge 13 in the engagement of the apex 16 thereof with the surface 8 of the neck forms a further compression seal.

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In using a structure as illustrated in FIGS. 1 to 6 inclusive, a container may be filled with a liquid which may be of the type providing substantial wetting to the portions around the neck, and then the closure 7 is positioned on the container 1 to engage the threads 5 thereon with the threads 4 on the neck, and the closure is then rotated relative to the container to move the wall 11 toward the end 8 of the neck. This rotation is continued until the apices of the serrations 18 on the ring member 17 engage the edge 10 of the neck, and then the rotation is continued to further screw the cap onto the container until the closure feels tight due to its resistance to further rotation. In this last portion of the rotation in the tightening of the closure onto the container, there is a cold flow in the serrations and edge portion 10 of the container neck to effect an abutting corresponding contour and sealing engagement and, also, an interlocking engagement as illustrated in FIG. 6 to prevent self-loosening of the closure. During the last portions of the rotation of the closure to the sealed position, the apex 16 of the ridge 13 on the container engages the end surface 8 of the neck and is compressed thereagainst to form a seal at the abutting portions and, due to the area of said abutting portions and the resiliency of the material, the axial force to effect the seal is relatively small whereby such force does not provide any effective action tending to rotate the closure on the container. When it is desired to dispense contents of the container, the container and closure are grasped and substantial manual force is applied to the closure to unscrew same from the container. This force overcomes interlocking engagement of the serrations with the neck, permitting the closure to be removed. While there may be some deterioration in the serrations by such unscrewing of the closure and, also, the abutting portions of the neck, due to the tapered arrangement of the serrations 18 and the surface 19, the closure can be reapplied to the container and again have an effective seal with an interlock that will prevent self-loosening of the closure.

In the form of the invention illustrated in FIG. 7, the container 25 has a wall or neck 26 with a substantially cylindrical bore 27 extending axially therethrough. The neck has an end 28 around the opening and screw threads 29 on the exterior surface of the neck adapted to receive screw threads 30 on a closure 31. The top wall 32 of the closure has a substantially cylindrical portion 33 extending therefrom and adapted to extend into the bore 27 of the neck. The portion 33 is preferably substantially the diameter of the bore 27 of the neck and formed in the periphery of said portion 33 are a plurality of circumferentially spaced serrations 35. The serrations 35 each extend generally parallel to the axis of the bore 27 and have an altitude that increases from a line 36 adjacent the lower end 37 of the member 33 to the bottom portion of the wall 32 where the serrations have their greatest altitude. The crest of the serrations at the greatest height extends outwardly from the periphery of the member 33 whereby the diameter formed by the crests of the serrations is greater than the diameter of the bore 27, the root diameter at the serrations being slightly less than the diameter of the bore 27. The serrations are substantially the same in cross-section as the serrations on the closure shown in FIGS. 1 to 6 inclusive and have the inclined surfaces and shoulders thereof in the same general relationship whereby the closure may be screwed onto the container with the flexibility and resiliency of the container and the closure being such that when the closure is tightened on the container there will be deformation of the inner portion of the neck engaged by the serrations of the closure to form an interlocking sealed engagement that will prevent any tendency for the closure to be self-loosening. The interlocking engagement is such that manual force to overcome the interlock will loosen the cap or closure from the container for removal thereof.

In the form of the invention illustrated in FIG. 8, the

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closure 38 is in the form of a cap having a top wall 39 with a depending skirt 40 having internal threads 41 adapted to engage external threads 42 on a neck 43 of a container 44. A plurality of serrations 45 are arranged in spaced relation around the outer portion of the inner surface of the wall 39 whereby when the closure is applied to the container the serrations will engage the end surface 46 of the neck 43. It is preferred that the serrations be of progressively greater height from the inner ends 47 thereof outwardly toward the skirt 40. Also, the transverse section to the serrations is substantially the same as illustrated relative to serrations in the form shown in FIGS. 1 to 6 inclusive and have the same operation whereby when the closure is applied to the container the serrations will engage the surface 46 of the neck and effect a deformation to provide a seal and interlock between the surfaces of the serrations and the contacting portions of the end 46 of the neck of the container.

In the form of the invention illustrated in FIGS. 9 to 11 inclusive, a container neck 49 of rigid material such as glass or the like has a surface 50 adapted to be contacted by a coating surface 51 of a closure 52, the closure being formed of flexible resilient material such as above-noted, which, when deformed, tends to return to its original shape when the deforming force is removed. The closure 52 has a skirt 53 with internal threads 54 adapted to engage external threads 55 on the neck 49. In the structure illustrated, the closure has a center portion 56 provided with a bore 57 with an enlarged portion 58 thereof spaced from the ends 59 and 60 of said center portion to receive and resiliently engage a collar portion 61 of a dispensing valve member 62, the valve member being such that when moved to a position as illustrated in FIG. 9 there is a flow passage between ribs 63 at the lower end of the dispensing valve and then around the stem portion 64 through a port 65 to a bore 66 to a discharge end 67. The shoulder 61 cooperates with the end 68 of the enlarged portion 58 to limit outward movement of the valve portion and a head 69 engaging the center portion of the closure on inward movement limits the inward movement of the dispensing valve. When the dispensing valve is in flow closing position, as illustrated in FIG. 10, a cylindrical portion of the stem is engaged in the lower end portion of the bore 57 in resilient engagement to form a seal. In the structure illustrated, there is a seal ridge or lip 70 depending from the central portion of the closure adjacent the skirt, said lip converging downwardly and adapted to have the apex 71 thereof engage an end surface 72 of the neck 49 when in container-sealing position to form a seal therewith. The closure also has the surface 51 generally of a frusto-conical shape provided with serrations 73 having a shape corresponding to the shape of serrations 74 in the surface portion 50 of the container neck. The serrations in the container neck are preferably inclined with a shoulder or abutment end 75 facing in the direction of rotation of the closure in the screwing thereof onto the container and, when the closure is applied, the serrations on the surface 51 have sealing and interlocking engagement with the serrations on the container to form a tight seal therewith and also to prevent any tendency of self-loosening of the closure.

It is believed obvious I have provided a container and closure structure, one or both of which are of flexible, resilient synthetic resin and wherein the structure provides a deformation and interlock that both provides a seal and prevents any self-loosening of the closure.

It is to be understood that while I have illustrated and described certain forms of my invention, it is not to be limited to the specific form or arrangement of parts herein described and shown except insofar as such limitations are included in the claims.

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What I claim and desire to secure by Letters Patent is:

1. In a device of the character described, in combination,

- (a) a container having a wall defining a dispensing opening therein, and with said wall having external screw threads thereon,
- (b) a closure member having an end wall and a collar portion depending from said end wall with internal screw threads on said collar engageable with said threads on the wall of the container for bonding the closure member onto said container in closing relation thereto,
- (c) one of said container and closure member being of formable material characterized by being capable of returning to its original shape when deforming forces are removed therefrom,
- (d) said container wall having a surface at the outer end of said dispensing opening and said closure member end wall having a surface that cooperates therewith, said surfaces being movable into engagement in response to screwing of the closure member onto said container, and
- (e) one of said cooperating surfaces having a plurality of circumferentially spaced serrations with each serration having a face inclined and terminating in a second face substantially perpendicular to the respective surface, said serrations forming interlocking portions with similar serrations on the other cooperating surface that extend transversely of the direction of the rotative movement of said cooperating surface of the closure member to resist loosening of the closure member.

2. In a device of the character described, in combination,

- (a) a container having a wall with an end having a surface defining an outer end of a dispensing opening therein,
- (b) external screw threads on said wall adjacent said dispensing opening,
- (c) a closure member having an end wall and a collar portion depending from said end wall with internal screw threads engageable with said threads on the wall of the container for bonding the closure member onto said container in closing relation thereto,
- (d) said closure member being of formable material characterized by being capable of returning to its original shape when deforming forces are removed therefrom,
- (e) said closure member end wall having a surface cooperating with said surface of said container wall end and movable into engagement therewith in response to screwing of the closure member onto said container, and
- (f) one of said cooperating surfaces having a plurality of serrations with each serration having a face inclined and terminating in a second face substantially perpendicular to the respective surface, said serrations forming interlocking portions with similar serrations on the other cooperating surface wherein the interlocking portions on the closure have the perpendicular face in trailing relation and transversely of the direction of rotation of the closure member in screwing same on the container wall and resists loosening of the closure member.

3. In a device of the character described, in combination,

- (a) a container having a wall with an end having a surface defining an outer end of a dispensing opening therein,
- (b) external screw threads on said wall adjacent said opening,
- (c) a closure member having an end wall and a collar portion with internal screw threads engageable with said threads on the wall of the container for bonding

- the closure member onto said container in closing relation thereto,
- (d) said container and closure member being of formable material characterized by being capable of returning to its original shape when deforming forces are removed therefrom, 5
- (e) said closure member end wall having a surface cooperating with said surface of said container wall end and movable into engagement therewith in response to screwing of the closure member onto said container, and 10
- (f) one of said cooperating surfaces having a plurality of serrations with each serration having a face inclined and terminating in a second face substantially perpendicular to the respective surface and in trailing relation to the serration and transversely of the direction of rotation of the closure member in screwing same onto the container wall, said serrations forming interlocking portions with similar serrations on the other cooperating surface that resist loosening of the closure member. 15 20
4. A container and closure therefor comprising, in combination,
- (a) a container having a substantially cylindrical portion open at one end extremity thereof and provided with external threads, said cylindrical portion having a surface at the outer end of the opening, 25
- (b) a reusable hollow closure cap of resilient material for said container adapted to fit over said one extremity of the latter and having a portion for threading engagement with said threads of the container, 30
- (c) said closure cap having a seal portion adapted to substantially engage said surface of said cylindrical portion adjacent said opening, 35
- (d) a plurality of serrations in circumferentially spaced relation on said seal portion of the closure cap with each of said serrations having a face inclined and terminating in a second face substantially perpendicular to the surface of said seal portion and in trailing relation to the serrations as the closure cap is rotated in screwing same onto the container, 40
- (e) said closure cap being of a resilient material characterized by being formable and capable of returning to original shape when deforming forces are removed therefrom, 45
- (f) said surface of the cylindrical portion of the container engaged by said serrations having cooperating surfaces comprising other serrations interengaged with said first named serrations and in sealing relationship to the surfaces thereof when the closure cap is screwed tight onto the container to form an interlock resisting loosening of the closure cap. 50
5. A container and closure therefor comprising, in combination,
- (a) a container having a substantially cylindrical wall portion defining a dispensing opening at one end extremity thereof and provided with external screw threads, said cylindrical portion having an end face and an inner surface at the outer end of the dispensing opening intersecting in an edge extending around the opening, 55 60
- (b) a reusable hollow closure cap of resilient material for said container adapted to fit over said one extremity of the latter and having an end wall and a collar portion depending from said end wall and having internal screw threads therein for threading engagement with said threads of the container for bonding the closure cap onto said container in closing relation thereto, 65
- (c) said closure cap having a portion on said end wall and adapted to move into engagement with one of the surfaces of said cylindrical portion at the outer end of said opening in response to screwing the closure cap onto the container, 70
- (d) a plurality of serrations in circumferentially spaced 75

- relation on said inwardly extending portion of the closure cap with each of said serrations having a face inclined and terminating in a second face substantially perpendicular to the surface of said inwardly extending portion and in trailing relation to the serrations and transversely to the direction of rotative movement as the closure cap is rotated in screwing same onto the container,
- (e) said closure cap being of a resilient material characterized by being formable and capable of returning to original shape when deforming forces are removed therefrom,
- (f) said surface comprising other serrations of the cylindrical portion of the container engaged by said first named serrations having cooperating surfaces interengaged with said serrations and in sealing relationship to the surfaces thereof when the closure cap is screwed tight onto the container to form an interlock resisting loosening of the closure cap.
6. A structure as set forth in claim 5 wherein,
- (a) the serrations have progressively greater altitude from points inwardly of the container opening to points outwardly from the surface of the container engaged thereby.
7. A structure as set forth in claim 5 wherein,
- (a) the container at the cylindrical portion is of resilient material of substantially the same characteristics as the closure cap and the engagement of the serrations of the closure cap with the cylindrical portion of the container effects a cold flow of the engaging surfaces and similar serrations thereon to form a seal and interlocking relationship of the serrations.
8. A structure as set forth in claim 5 wherein,
- (a) the container is of rigid material and has serrations on the surface thereof adapted to be engaged by the serrated surface of the closure cap to form a mating sealing engagement therewith.
9. A bottle and closure therefor comprising, in combination,
- (a) a bottle having a substantially cylindrical portion open at one end extremity thereof and provided with external threads, said cylindrical portion having an end face and an inner surface at the opening intersecting in an edge extending around the opening,
- (b) a reusable hollow closure cap of resilient material for said bottle adapted to fit over said one extremity of the latter and having a portion for threading engagement with said threads of the bottle,
- (c) said closure cap having a portion extending into the container opening and having a downwardly and inwardly inclined surface adapted to substantially engage said edge of said cylindrical portion adjacent said opening,
- (d) a plurality of serrations in circumferentially spaced relation on said inclined surface of said inwardly extending portion of the closure cap with each of said serrations having a face inclined and terminating in a second face substantially perpendicular to the inclined surface of said inwardly extending portion and in trailing relation to the serrations and transversely of the direction of rotation of the closure cap in screwing same onto the bottle,
- (e) said closure cap and bottle being of a resilient material characterized by being formable and capable of returning to original shape when deforming forces are removed therefrom,
- (f) the edge of the cylindrical portion of the bottle engaged by said serrations providing cooperating surfaces comprising other serrations interengaged with said first named serrations and in sealing relationship to the surfaces thereof when the closure cap is screwed tight onto the bottle to form an interlock resisting loosening of the closure cap.
10. A device as set forth in claim 9 wherein,

- (a) the serrations on the downwardly and inwardly inclined surface extend outwardly thereof and have progressively greater altitude from a point spaced inwardly of said inner surface of the cylindrical portion of the bottle to substantially outwardly of said edge on said cylindrical portion. 5
11. In a device of the character described, in combination,
- (a) a container having a wall defining a dispensing opening therein with said wall having an internal surface extending around said dispensing opening, said wall having external screw threads thereon, 10
- (b) a closure member having a collar portion with internal screw threads engageable with said threads on the wall of the container for bonding the closure member onto said container in closing relation thereto, said closure member having a depending portion extending into said dispensing opening with a peripheral surface substantially engaging said internal surface of the container wall, 15
- (c) one of said container and closure member being of formable material characterized by being capable of returning to its original shape when deforming forces are removed therefrom, 20
- (d) said peripheral surface of the depending portion of the closure member and the internal surface of the container wall being cooperating surfaces movable into engagement in response to screwing of the closure member onto said container, and 25
- (e) one of said cooperating surfaces having a plurality of circumferentially spaced serrations with each serration having a face inclined and terminating in a second face substantially perpendicular to the respective surface, said serrations forming interlocking portions with similar serrations on the other cooperating surface that extend transversely of the direction of the rotative movement of said cooperating surface of the closure member to resist loosening of the closure member. 30
12. A device as set forth in claim 11 wherein,
- (a) the serrations are on the peripheral surface of the depending portion of the closure member and extend outwardly thereof, said serrations having progressively greater altitude from a point spaced inwardly of the dispensing opening in said container wall to a point substantially outwardly of said wall. 35
13. A device as set forth in claim 12 wherein,
- (a) the container wall is of resilient material of substantially the same characteristics as the closure member and the engagement of the serrations on said depending portion of the closure member with the cooperating surface of the container wall effects a cold flow of the engaging surfaces to form a seal and interlocking relationship of the serrations. 40

14. In a device of the character described, in combination,
- (a) a container having a wall defining a dispensing opening therein, said container wall having an end surface and an internal surface at the dispensing opening intersecting the end surface in an edge extending around said dispensing opening,
- (c) a closure member having a collar portion with internal screw threads engageable with said threads on the wall of the container for bonding the closure member onto said container in closing relation thereto, said closure member having a depending portion extending into said dispensing opening with a downwardly and inclined surface engaging said edge of the container wall,
- (d) said container and closure member being of formable material characterized by being capable of returning to its original shape when deforming forces are removed therefrom,
- (e) said downwardly inclined surface of the closure member and the edge of the container wall being cooperating surfaces movable into engagement in response to screwing of the closure member onto said container, and
- (f) one of said cooperating surfaces having a plurality of serrations with each serration having a face inclined and terminating in a second face substantially perpendicular to the respective surface and in trailing relation to the serration and transversely of the direction of rotation of the closure member in screwing same onto the container wall, said serrations forming interlocking portions with similar serrations on the other cooperating surface that resist loosening of the closure member.
15. A device as set forth in claim 14 wherein,
- (a) the serrations are on the downwardly and inwardly inclined surface of the depending portion of the closure member and extend outwardly thereof, said serrations having progressively greater altitude from a point spaced inwardly of said container wall to substantially outwardly of the edge on said wall.

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