March 12, 1935. R. SORGAN 1,994,257

RECEPTACLE WITH LEAKAGEPROOF CLOSURE MEANS THEREFOR

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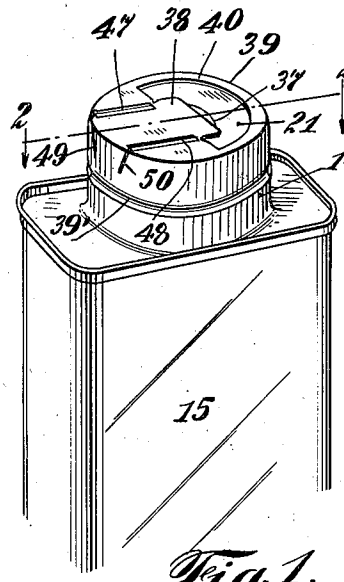


Fig. 1.

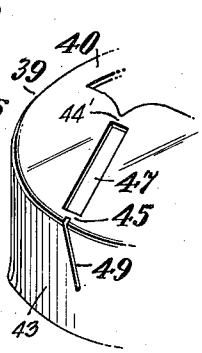
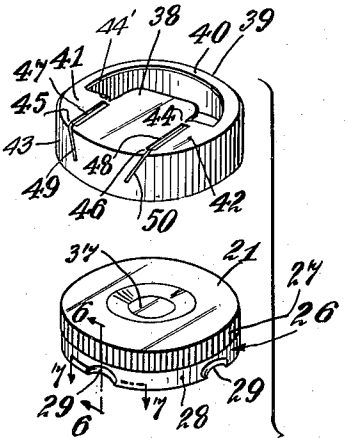


Fig. 5.



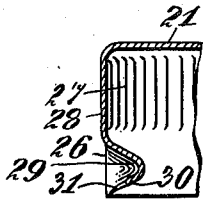
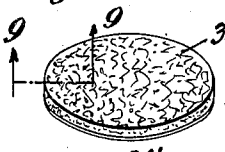


Fig. 6.



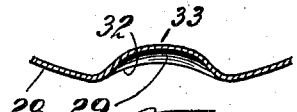


Fig. 7.

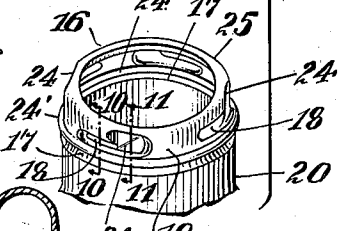


Fig. 3.

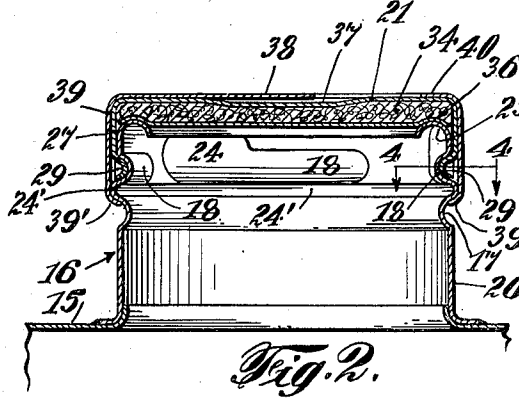


Fig. 2.

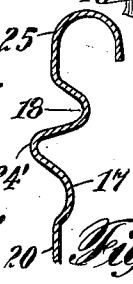


Fig. 10.

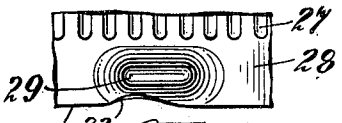


Fig. 8.

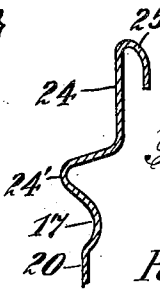


Fig. 11.

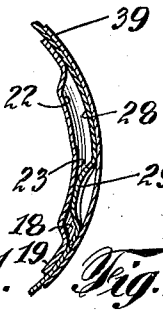


Fig. 4.

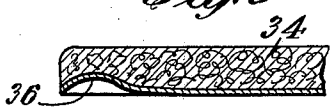


Fig. 9.

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1,994,257

RECEPTACLE WITH LEAKAGEPROOF CLOSURE MEANS THEREFOR

Robert Sorgan, Jersey City, N. J.

Application March 4, 1932, Serial No. 596,725

7 Claims. (Cl. 220—40)

This invention relates to receptacles with leakage-proof closure means therefor. More particularly, the invention relates to metallic containers with a nozzle extending from the body portion thereof and provided with capping and sealing means in connection with said nozzle.

Cans, containers, or receptacles as used for lacquers, varnishes, paints, solvents, thinners, oils, and other liquid-containing articles, are generally provided with a nozzle portion and cap attached thereto extending from the body portion of the can. Oftentimes such cans, containers or receptacles leak because the nozzle portion has structural defects in connection with the capping portion. These defects are often so serious that when the filled cans are being transported from the factory to the dealer or consumer direct the liquid leaks therefrom because of the rough handling and managing during shipment causing considerable loss of material.

It is a general object of this invention, therefore, to avoid the aforementioned defects.

Another object of this invention is to provide a metallic container having a closure means for effectively and securely sealing the container.

Still another object of the invention is to provide a simply constructed container having closure means which initially requires tool pressure to close the same against the container and which subsequently is easy to remove and still maintain an effective leakage-proof seal when subsequently used in connection with the container.

One further and particular object of this invention is to provide a container with a nozzle having discontinuous circumferential grooves which also extend partly longitudinally therefrom toward the free end of the nozzle, a cap, and means intermediate the cap and nozzle and a sealing member covering the peripheral portion of the cap and also the nozzle for preventing loosening of the cap or tampering with the same until the time when necessary for the use of the contents of the container.

With the above and other objects and features in view, the invention in its preferred embodiment includes a container with a nozzle extending therefrom having a plurality of staggered discontinuous grooves on the periphery thereof, a cap adjustably mountable on the nozzle, a disk member intermediate the nozzle and cap for covering the nozzle end, and a sealing unit or member combined with the cap for preventing tampering of the cap or nozzle before the sale of the container.

The invention furthermore consists in the new and novel features of the construction and the arrangement of the parts hereinafter described in connection with the accompanying drawing and as more particularly set forth in the appended claims.

Referring in detail to the drawing wherein is shown one simple, preferred and practical embodiment of the invention:—

Figure 1 is a fragmentary perspective view of the container showing the capping and sealing means;

Fig. 2 is a section of the nozzle, capping and sealing means taken on line 2—2 of Fig. 1;

Fig. 3 is an expanded perspective view showing the various parts of the preferred embodiment of the invention;

Fig. 4 is a section taken on line 4—4 of Fig. 2, showing the engagement of the cap and nozzle;

Fig. 5 is an enlarged fragmentary perspective view of a detail of the sealing member;

Fig. 6 is a detail sectional view of the depression taken on line 6—6 of the cap shown in Fig. 3;

Fig. 7 is a detail plan view of the depression of the cap taken on line 7—7 of the cap in Fig. 3;

Fig. 8 is a face view of one of the depressions showing the slightly ridged edge of the cap;

Fig. 9 is a fragmentary sectional view taken on the line 9—9 of the intermediate disk member showing the peripheral groove formed upon engaging the cap with the nozzle;

Fig. 10 is a detail elevation on line 10—10 of the nozzle; and

Fig. 11 is a detail on line 11—11 of the nozzle.

Similar reference characters designate corresponding parts throughout the various views.

Referring to the drawing, the preferred illustrated embodiment includes a metallic receptacle container or can 15 of elongated shape, although any form is suitable. The can at one end contains a nozzle 16 which is integral with or welded or joined to the top of the can 15. The nozzle, being cylindrical in section, has an upper portion with indentations of smaller diameter for permitting proper adjustment thereon of the capping and sealing means hereinafter more fully described. The difference in diameter is due to the depressions formed in the nozzle to obtain the present embodiment.

The nozzle 16 contains a peripheral annular bead 17 above which are set a plurality of discontinuous circumferential recesses or grooves 18 in the face of the nozzle 16 and substantially parallel with the bead. Intermediate each recess or groove 18, the peripheral face portion 19 of the nozzle is substantially contiguous with the part 20 beneath the bead 17 to afford a smooth backing for a cap 21.

The recesses or grooves 18 are formed by mechanical pressure, such as by a punch press, against the exterior of the nozzle, at definite parts

of the periphery thereof. The depth of said grooves 18 is such as to accommodate the engaging means of the cap 21 and one portion, namely, the forward peripheral portion 22 is of slightly less depth than the other portion 23 in each groove, as shown in Fig. 4 of the drawing.

Extending at an angle from the discontinuous grooves 18 are the longitudinal grooves 24 which are punch-pressed or formed from the free end of the nozzle 16 to the discontinuous groove 18. The depth of such longitudinal grooves is the same as the deeper portion of each discontinuous groove 18 above the bead 17 and merges with it to permit easy sliding of the cap 21 along the longitudinal grooves before engagement. It will be noted that the grooves in the nozzle are set in staggered and spaced apart relation with each other on the periphery of the nozzle portion above the bead 17 so as to afford a symmetrical configuration to the nozzle. Furthermore, as shown in Fig. 11, the sectional outline of the longitudinally extending groove is straight so that it is substantially parallel with the part 20 of the nozzle below the bead. The outline, as shown in Fig. 10, illustrates the configuration of the discontinuous groove 18 with respect to the bead 17 and end portion of the nozzle. The grooves are of substantially the same depth as the bead 17, while the intermediate curved part 24' extends further outwardly than the end 25 of the nozzle.

The nozzle 16 has its free end 25 bent inwardly or ducked to form a smooth edge for forming a smooth contact with a sealing member in the cap 21, as will be hereinafter more fully described. The cap 21 has a side depending peripheral wall 26 with its upper portion 27 milled to prevent undue wear on the peripheral surface thereof and also to provide easy grasping means for permitting the cap to be engaged onto or disengaged from the nozzle 16. The lower or unmilled portion 28 of wall 26 is provided with a plurality of inward radial depressions 29 set at spaced intervals. Such depressions 29 may be formed by any well-known means such as a punch press and are of a depth sufficient to permit easy sliding over the longitudinal grooves 24. The depressions 29 are set at the edge of the peripheral wall 26 and for purposes of illustration are shown straight or perpendicular to the lower portion 28 of the wall, although they may be slightly tilted to permit greater hugging action in the grooves of the nozzle. Each depression 29 when viewed from the exterior, as shown in Fig. 3, shows the peripheral wall 26 bent and curved inwardly and then downwardly toward the axial center of the cap. Thence, the bent portion 30 of the wall continues downwardly at an incline to the peripheral edge 31. The edge 31 of each depression ends short of the depending peripheral wall and as such provides excellent anchoring or engaging means. One end 32 of the depression edge meets with the edge of the peripheral wall 26 and forms a ridge or incline so that upon screwing the cap 21 on the nozzle a tighter fit is effected at that portion with the discontinuous grooves 18.

The depression as illustrated in Fig. 7 shows a contour 33 similar to the grooves 18 for effecting a flush contact to retain the cap 21 in engaged position on the nozzle 16. In the instant case four depressions 29 are shown in the wall 26 but merely for purposes of illustration only and they correspond in number with the grooves 18 and 24 in the nozzle 16. These depressions 29 of cap 21 fit loosely in the longitudinally extending grooves 24 to permit easy setting of the cap on the nozzle, but make a close fit with the circumferential discontinuous grooves 18, as shown in Figs. 2 and 4. The slightly raised face portion 23 of the groove 18 permits better contact with the depressions 29 of the cap.

It will be noted that the depressions or tongues 29 are located at the lowermost edge of the peripheral wall or flange 26, whereby the largest possible yieldability and resiliency is obtained. It will also be noted that the depressions 18 are close to and contiguous to the intermediate curved part or shoulder 24', as clearly seen in Fig. 2. When the cap 21 is secured tightly the lowermost edge of the cap 21 abuts against the shoulder 24'. When the cap 21 is in this position the detachable outer sealing cap 39 has its lowermost edge portion bent over the lower part of the shoulder of the nozzle, as shown in Fig. 2. Upon ripping off the member 39 the outer sealing cap is readily removable, and then the cap 21 by reason of the relationship just described acts as a secure closure when the container is in use, nevertheless permitting ready removal of the cap 21.

Inside the cap 21 is a resilient disk member 34 set against the top wall thereof whereby to provide a leakage-proof contact with the inbent or ducked portion 25 of the nozzle and prevents the escape of any of the contents from the container 15. The shape of disk member 34 corresponds with the circumference of the cap and forms a snug fit against the inner face of the peripheral wall 26. The disk member 34 may be of any resilient material such as compressed paper, fiber or cork having a metal foil on its under face portion facing the end of nozzle 16 to make contact with the inbent end 25. The member may be made coated to prevent being soaked by the contents. It is to be noted that the resilient disk member 34 is compressed more tightly against the nozzle by the cap 21 as it is being engaged onto the nozzle, and when the cap is first engaged with the nozzle, extra or tool pressure must be applied at the milled portion 26 to form an annular groove 36 on the face of the disk in contact with the nozzle.

With the disk member 34 in the cap the depressions 29 slide easily into the longitudinal grooves 24 of the nozzle and make contact with the portion of the circumferential discontinuous grooves 18 merging with the first-mentioned grooves. However, upon further turning the cap clockwise against the nozzle, a little resistance is encountered due to the disk member 34 being compressed between the cap 21 and the inbent portion 25 of the nozzle and also because of the slight rise of the part 23 of the circumferential groove 18. Furthermore, movement of the cap causes the formation of a permanent annular peripheral groove 36 corresponding in depth with the length of turn of cap 21. The peripheral groove thus formed effects a leakage-proof closure with the nozzle end so as to prevent any escape of the contents from the container. In this manner, also, the cap is maintained securely onto the nozzle 16. It is to be noted also that the thickness of the disk member 34 used in the cap, affects to a certain extent the amount of tool pressure required when the cap is first used on the nozzle, to form a peripheral groove of desired depth in the disk corresponding with the periphery of the inbent portion of the nozzle. Once the permanent peripheral groove has been formed in the disk member 34 it is not necessary to use tool or extra pressure whenever cap 21

is to be engaged with the nozzle 16 for closing the container 15.

The cap 21 in addition to the features above set forth has a centrally depressed top portion 37 for permitting the insertion of grasping means between said portion and the strip 38 of an annular sealing member 39. The latter member has part of its top portion cut away to provide a recess for the insertion of the fingers or other means between the underside of the strip 38 and the depression 37 of cap 21. The annular member 39 has a semi-circumferential top extending flange portion 40 at the recess portion merging into the half top face portions 41 and 42 so as to provide a rest on the cap 21.

The strip 38 is joined to the sides of the top face portions 41 and 42 by means of the thin strip like connections 44 and 44' respectively, while the lower end of the strip is joined at the top of the peripheral wall 43 of the member by means of the connections 45 and 46 respectively. Intermediate the strip 38 and the side portions 41 and 42 are the cut-outs or grooves 47 and 48 respectively, while beneath the strips 45 and 46 are the converging slits 49 and 50.

It will be noted that the strip 38 extends to and merges with the peripheral wall 43 and is separated therefrom by the small converging slits above mentioned. The sealing member 39 as a whole is of relatively thin metal and strip 38 is such as to permit easy separation from the side portions 41 and 42.

The peripheral wall 43 of the annular sealing member 39 extends down over the peripheral wall of the cap 21 and the beaded portion 24' of nozzle 16 and into the annular depression 17. Upon sealing, the free edge of the peripheral wall 43 is crimped inwardly against the annular depression 17 forming a seal as shown in Fig. 2 to prevent tampering with or loosening of the cap and thus the loss or substitution of any liquid in container 15.

When it is desired to remove the contents from the container, the end of strip 38 is grasped and pulled free of the side strip connections 44 and 44' and the strips 45 and 46 abutting the top of peripheral wall 43. The pulling on the strip is continued until it is torn free of the peripheral wall, thus cutting apart the annular member 39' which springs loose of the cap 21. The cap then is ready for disengagement with the nozzle and removal of the contents from the container may be effected. It is to be noted that the annular sealing member 39 instead of being made of relatively thin metal can be made of any material which will be easily torn apart.

From the foregoing description of the preferred embodiment, taken in connection with the accompanying drawing, it will be noted that a sealing connection is obtained which is effective against leakage or tampering. The discontinuous grooves of the nozzle are in connection with grooves extending angularly therefrom and provide means for retaining the radial inward depressions on the cap. The grooves are formed to provide an efficient and non-leakable nozzle end when engaged by the cap. When the cap containing the disk member is first used in connection with the nozzle, extra pressure is required to effect proper closure to form a leakage-proof seal. The engagement of the cap with the nozzle sets the disk member within the cap and also adjusts it so that said disk member will be easily accommodated against the end of the nozzle and form a circumferential groove corresponding with the nozzle end. Also the depth of a portion of the discontinuous grooves being slightly less than that of the depressions on the cap, permits a relatively tight engagement therewith. The groove once formed in the disk member is permanent, and needs no further extra effort to put the cap on the nozzle. The annular seal member surrounds the periphery of the cap and also a portion of the nozzle to prevent leakage, opening, or tampering with the container. It will have been seen that the invention is the improvement in a metallic container consisting of a nozzle having a plurality of peripheral discontinuous grooves terminating in grooves longitudinally of the nozzle, and a cap having a plurality of radially inbent depressions forming tongues for effectively engaging the longitudinal grooves of the nozzle and upon turning of the cap the peripheral grooves engage the tongues thereof. The inbent portion of the nozzle at the longitudinally extending grooves is smooth to permit easy passage therealong of the tongues in the cap. The invention also includes the tongue members being slightly tilted with respect to the peripheral grooves to secure a greater locking action. Also it includes in the combination thereof a yieldable disk to secure complete interior sealing of the nozzle and cap with respect to each other, and finally the invention includes the provision of a specific external sealing member which may or may not be applied to the other parts specifically embodied in the invention.

While one preferred embodiment has been described, in connection with the accompanying drawing, it is to be understood that various modifications as to form, construction, structure, or use of material may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In a container, a nozzle having an annular depression parallel with an inturned beaded portion above the same and angular grooves at spaced intervals thereof, a cap with a peripheral wall extending down the sides of the beaded portion and having a corresponding depression extending into the grooves of the nozzle and forming a tight fit therewith, an intermediate disk member for said nozzle, and an annular sealing member having a top portion, covering the cap, and partly cut away to form a recess on the top, a strip extending toward the recess providing means for grasping the same, a peripheral wall portion connecting the strip and covering the wall of said cap and extending down to the annular depression of the nozzle, said strip having grooves between itself, the top portion and the peripheral wall thereof whereby to permit pulling of the strip and tearing apart of the peripheral wall for removing the cap from said nozzle.

2. In a metal container having a nozzle having spaced depressions in its wall, an inner cap having inwardly extending tongues forming a tight fit with the depressions on the nozzle, and an intermediate sealing disk, the improvement including an outer sealing cap having a depending enclosing cylindrical wall for the inner cap crimped to part of the nozzle, and a top with a substantially semi-circular recess leaving a marginal top edge covering the inner cap at said portion, and a retaining portion with slits passing over the peripheral wall and converging on said peripheral wall, whereby to form an intermediate strip adapted to be grasped for tearing apart the

peripheral wall of the outer cap and release the same.

3. In a metal container, a cylindrical metal nozzle having an annular shoulder of larger diameter than the nozzle diameter, a plurality of discontinuous circumferentially disposed depressions in the same horizontal plane and contiguous to the shoulder of the nozzle and having grooves of greater depth than the depressions extending therefrom longitudinally of the nozzle towards the free nozzle edge, the longitudinal grooves being at right angles to the horizontal depressions, and a metal cap formed of a disc and depending circumferential flange and having a plurality of circumferentially disposed inwardly extending tongues arranged at the edge of the flange, said tongues having a length less than the width of the longitudinal grooves and having an overall radial depth with respect to the cap to be free to pass over the free nozzle edge and over the longitudinal grooves thereof, said tongues being adapted to clampingly engage the horizontal depressions of the nozzle and lock the cap to the nozzle upon effecting a turning movement of the cap in respect to the nozzle when said flange of the cap abuts the annular shoulder of the nozzle.

4. In a metal container, a nozzle having a plurality of discontinuous circumferential depressions disposed in the same horizontal plane, and having grooves of slightly greater depth extending therefrom longitudinally of the nozzle, the longitudinal grooves being at right angles to the horizontal depressions, a cap having a plurality of spaced, circumferentially disposed, inwardly extending rounded tongues of a length less than the width of the longitudinal grooves and of an overall depth, adapted to pass freely above the end of the nozzle and over the longitudinal grooves thereof and without contact therewith upon placing the cap on the nozzle in a longitudinal direction to form a tight fitting contact within the depressions of the nozzle and lock the cap to the nozzle upon turning the cap with respect to the nozzle, the horizontal depressions of the nozzle and the tongues on the cap being tilted relatively to each other.

5. In a metal container, a cylindrical nozzle having an annular shoulder of larger diameter than the nozzle diameter, a plurality of discontinuous circumferentially disposed depressions in the same horizontal plane and having grooves of greater depth than the depressions extending therefrom longitudinally of the nozzle towards the free nozzle edge, the longitudinal grooves being at right angles to the horizontal depressions, said depressions and grooves being above said shoulder, an inner cap formed of a disc and depending circumferential flange and having a plurality of inwardly extending tongues circumferentially disposed in the same horizontal plane, said tongues having a length less than the width of the longitudinal grooves and having an overall radial depth with respect to the inner cap to be free to pass over the free nozzle edge and over the longitudinal grooves thereof, said tongues being adapted to clampingly engage the horizontal depressions of the nozzle and lock the cap to the nozzle upon effecting a turning movement of the inner cap in respect to the nozzle when said flange of the inner cap abuts the annular flange of the nozzle, and an outer cap over the inner cap and provided with a flange having an inturned continuous lower edge bent over the lower part of the shoulder of the nozzle.

6. In a metal container, the combination comprising a cylindrical metal nozzle and a nozzle closure, said nozzle having an annular shoulder of larger diameter than that of the nozzle, a plurality of right angle depressions in part circumferential and in part longitudinal, an inner metal cap formed of a disc and a depending circumferential flange having a plurality of tongues at the edge of the flange, said tongues being adapted to be brought in registration with the longitudinal depressions and to clampingly engage with the horizontal depressions and with the shoulder of the nozzle, an outer cap over the inner cap and provided with a flange having an inturned continuous lower edge bent over the lower part of the shoulder of the nozzle, and having a top wall provided with a marginal covering for the inner cap and provided with a finger-receiving opening, said flange being provided with spaced weakening lines extending from the juncture of the flange with the top wall in divergent angles and terminating in spaced relation near the free edge of said flange having the lower edge of the flange integral, said top wall having spaced weakening lines therein extending inwardly from said juncture to and continuous with weakening lines and terminating adjacent the finger-receiving opening, the material of small extent between the weakening lines and the finger-receiving opening remaining integrally connected with said top wall at the ends of said weakening lines, a portion of said material extending with the finger-receiving opening and providing a finger piece flush with the upper surface of the inner cap to enable a part of the top wall and a part of the depending flange to be readily torn out to effect removal of the outer sealing cap from the inner cap and the disengagement of the outer cap flange from the nozzle shoulder but permitting the inner cap to remain in clamping engagement with the nozzle.

7. In a metal container, a cylindrical nozzle having an annular shoulder of larger diameter than the nozzle diameter, a plurality of discontinuous circumferentially disposed depressions in the same horizontal plane and having grooves of greater depth than the depressions extending therefrom longitudinally of the nozzle towards the free nozzle edge, the longitudinal grooves being at right angles to the horizontal depressions, said depressions and grooves being above said shoulder, an inner cap formed of a disc and depending circumferential flange and having a plurality of inwardly extending tongues circumferentially disposed in the same horizontal plane, said tongues having a length less than the width of the longitudinal grooves and having an overall radial depth with respect to the inner cap to be free to pass over the free nozzle edge and over the longitudinal grooves thereof, said tongues being adapted to clampingly engage the horizontal depressions of the nozzle and lock the cap to the nozzle upon effecting a turning movement of the inner cap in respect to the nozzle when said flange of the inner cap abuts the annular flange of the nozzle, and an outer cap over the inner cap and provided with a flange having an inturned continuous lower edge bent over the lower part of the shoulder of the nozzle.

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