April 8, 1941. C. F. SMITH 2,237,952

LEAKPROOF COVER AND RING SEAL

Filed June 4, 1938

Fig. 1.

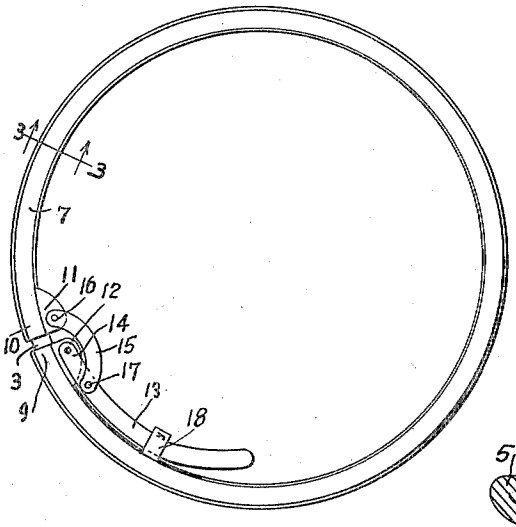



Fig. 3.

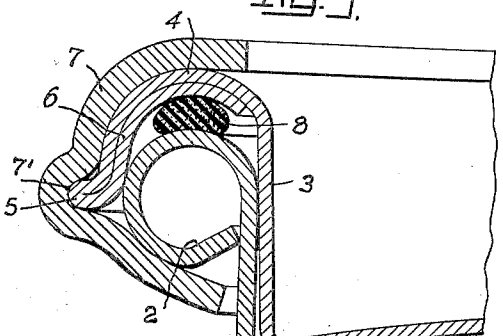



Fig. 5.

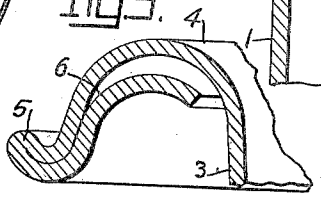



Fig. 2.

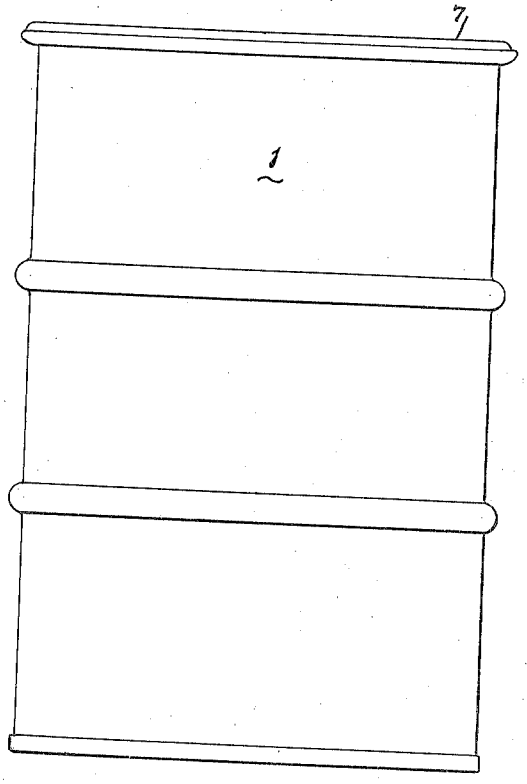
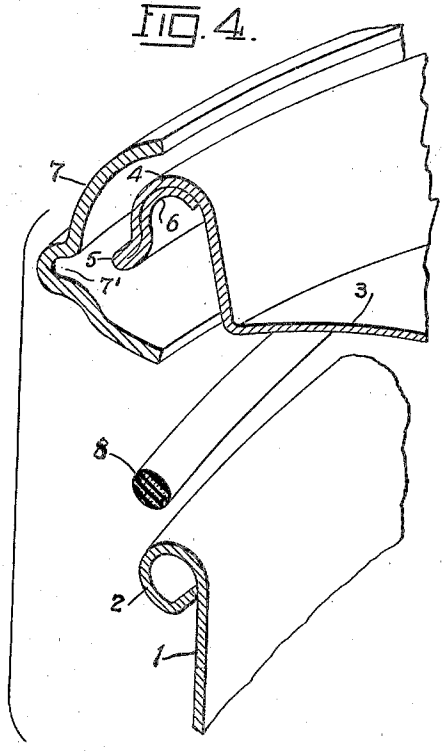



Fig. 4.




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# UNITED STATES PATENT OFFICE

2,237,952

## LEAKPROOF COVER AND RING SEAL

Charles F. Smith, Martins Ferry, Ohio

Application June 4, 1938, Serial No. 211,891

1 Claim. (Cl. 220—61)

This invention relates to an improvement in receptacles or containers having readily removable covers, and more particularly to improved fluid tight closures therefor.

An object of this invention is to provide an improved fluid tight cover and ring sealing means for full open top barrels or drums.

The principal object of this invention is to provide a receptacle of the type mentioned wherein the cover is folded under and backward upon itself in a manner to yieldably rest upon the packing material which forms the fluid sealing means. In this way the contraction or shrinkage of the gasket or packing sealing ring in use is automatically compensated for by the spring action of the cover. A highly efficient fluid seal is thereby insured at all times when the cover interlocking clamping ring thereover is in place.

Another object is to provide an improved fluid sealing means comprising an interlocking clamping ring for securely fastening and exerting a uniform pinching action upon the flanged cover to force the under extending wall of the cover yieldably against the gasket or sealing member.

Referring to the drawing:

Figure 1 is a top plan view of a metal drum or container provided with the improved fluid seal of this invention;

Figure 2 is an elevation view of the drum or receptacle shown in Figure 1;

Figure 3 is an enlarged cross section taken on the line 3—3 of Figure 1, showing a cut out section of the whole lid illustrating the clamping ring, cover rim and bead on the head of the drum assembled with packing gland in place, forming a fluid tight seal for the container;

Figure 4 is a detail view in section, with portions broken away, of the parts making up the fluid seal;

Figure 5 is a detail view in section showing the spring action of the cover.

Referring more particularly to the drawing, 1 denotes a drum or barrel such as conventionally employed for shipping solvents, paints, oils and the like. The open end of the drum 1 is provided with a rolled edge to form a circumferential reinforcing bead 2. The bead 2 may be of any suitable shape in cross section but is preferably oval or rounded as illustrated in Figure 3. Over the bead 2 is applied a cover 3 which is supported thereby.

The cover 3 comprises a cupped portion 4 with a laterally extending flange 5 and a backward folded under part 6. This turned back wall portion or skirt 6 conforms with the under side of the cupped wall 4 but is free to move away from the wall 4 when tension is applied to the flanged bend 5. The folded under skirt 6 extends back along the wall member 4 so as to provide a double wall for the cupped section 4 overlying the projecting bead or rim 2 of the barrel or drum 1. The cover 3 is securely fastened to the barrel by means of the open contractible interlocking clamping ring 7 which extends around the top of the barrel and cover as shown in Figure 1.

The ring 7 is of a distorted U shape in cross section and engages the outer wall of the cupped cover section 4 and fits over and around the laterally extending flange 5 and terminates under the barrel head bead 2, as illustrated in Figure 3. The ring member 7 has a recess or grooved portion 7' therearound for engaging and retaining the flange bend extension 5 of the cover 3. The clamping ring 7 thus interlocks with the flange 5 of the cover 3 and besides holding these parts tightly together, exerts an upward force on the flange bend 5 so as to increase the tension on the backward extending wall portion 6, tending to spring it way from the wall 4 of the cover. The member 6 in this manner functions as a rectangular plate spring.

The cover preferably will be made of metal or equivalent resilient material. Likewise the container and clamping ring will ordinarily be made of metal or at least the sealing head portion. Laminated materials reinforced with metal may also be employed for constructing the containers and sealing means of this invention.

For providing a fluid tight joint between the cover and barrel head there is interposed between the spring plate member 6 of the cover 3 and the top of the barrel head bead or flange extension 2 an elastic sealing gasket or packing ring 8. This packing member is preferably made of rubber or other suitable resilient material, such as synthetic rubber, cork, resin, or the like. The packing gland should be formed from material which will not be attacked by the contents of the container.

The clamping ring 7 is in the form of an open or split ring. Adjacent the ends 9 and 10 of the ring sections are inward extending lugs 11 and 12, for providing an extension for engaging and pulling the ring sections together. The lugs 11 and 12 are preferably formed integral with the ring 7. A suitable means for drawing the ends of the ring together to contract it upon the cover and barrel

head bead is shown in Figure 1. The conventional lever actuating means, as illustrated, comprises the hand lever 13 which is pivotally connected to the lug 12 by means of the bolt or pin 14. The link 15 is pivoted at one end to the lug 11 by the pin 16 and at the other end of the lever 13 at 17. It will be understood that when the lever is moved to the position shown in Figure 1 the end sections of the ring 7 will be tightly drawn together. A locking means 18 is provided to prevent accidental release of the lever 13 and opening of the container.

It will be observed that by reason of the flange cover 3 having the folded back-in-under wall section 6, a resilient spring metal ring extension is thereby provided which yieldably presses upon the packing ring 8. This spring action of the folded under skirt extension 6 of the cover is further enhanced by reason of the outward extending bend portion 5 round which the ring 7 interlocks. When the complementary segments of the ring 7 are clamped tightly together by means of the hand lever 13 and link 15, force is exerted upward against the flange 5 tending to force the inner wall 6 away from the cover part 4. This upward pressure of the clamping ring 7 is uniformly distributed around the cover and likewise upon the packing gland 8, in such a manner that any contraction or shrinking of the packing or gasket sealing ring 8, during use, is automatically compensated for by the outward movement of the wall 6. This insures a perfect fluid seal between the cover and barrel head opening at all times.

It is by reason of the novel spring acting cover and uniform pressure exerted by the clamping ring applied thereover that the greatly improved fluid sealing cover means of this invention is obtained.

To open the container the hand lever attached to the clamping ring is unlocked and swung back to expand the clamping ring so that it can be readily removed exposing the cover and packing gland ring which likewise may be removed. The cover can thus be easily removed and replaced when desired, to produce an efficient fluid tight cover for containers.

It is understood, of course, that this invention is not limited to the exact details of construction since obvious modifications within the scope of this invention may be made by those skilled in the art.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

A metal receptacle having a bead encircling its open end, a removable cover for said receptacle provided with a peripheral cup-shaped skirt extending over said bead and having a backwardly folded wall portion forming a peripheral spring-flap member and defining a folded free edge portion, said folded free edge portion extending downwardly along the outer periphery of said bead and curved outwardly forming a peripheral out-turned flange, a resilient sealing ring disposed between said spring-flap member and bead, and a clamping ring means engaging around said bead and peripheral skirt cover section and having a circumferential groove therein adjacent the mid-portion thereof, said groove receiving said out-turned flange and in interlocking engagement therewith, said groove being so shaped and positioned with respect to the outwardly extending flange and bead that when in clamped position an upward force is exerted on the bend of the outwardly turned flange and increased tension is exerted on the spring-flap member tending to spring it away from the adjacent portion of the skirt and place the resilient sealing ring under constant spring tension, thereby tightly sealing the resilient ring against the bead at all times.

CHARLES F. SMITH.