

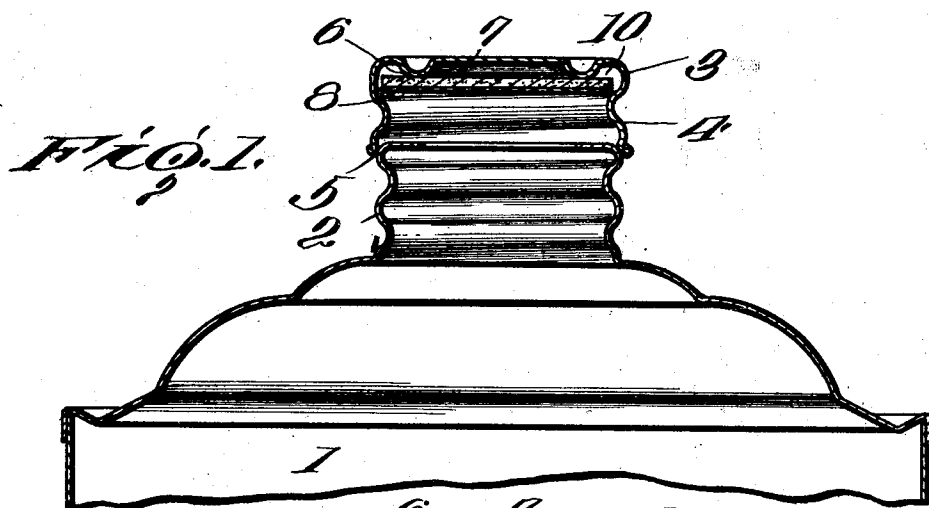
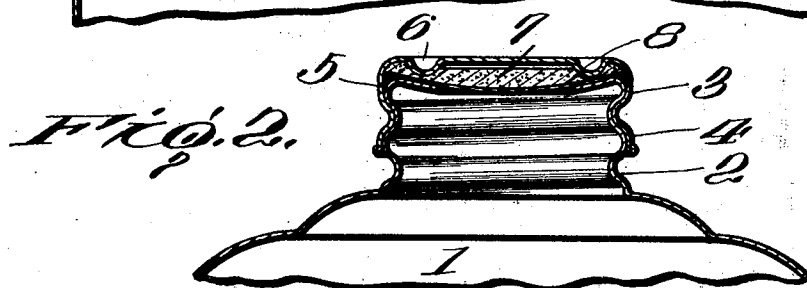
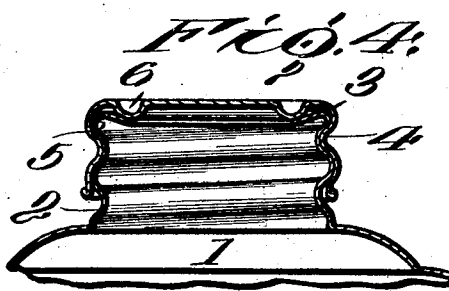
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VALVE SEAT SEAL CAP

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VALVE-SEAT SEAL CAP.

Application filed May 23, 1924, Serial No. 715,418.

To all whom it may concern:

Be it known that I, JOHN F. McGARRAHAN, a citizen of the United States, residing at Riverside, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Valve-Seat Seal Caps, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

The invention relates to new and useful improvements in valve seat seal caps for metal containers, and more particularly for spring caps of the screw thread type.

In the patent heretofore issued to me on the 23d day of May, 1922, No. 1,417,341, I have shown, described and claimed a cap having a depending portion extending down over the top portion of the container, the two having interengaging means, such as screw threads, for holding the cap on the container body, the said cap having a central indented portion of less diameter than the opening into the container and having an annular channel disposed above an inwardly extending flange on the container body combined with a sealing disk, whereby, when the cap is secured on to the top, the indented portion of the cap operates to force the sealing disk into the opening in the container body and imbed the inner edge of the flange in the sealing disk to form a tight seal.

The present invention, as above stated, presents several features of improvement over the patent mentioned—in that the central portion of the top is not indented, but is provided with a concave annular bead, the main body of the central portion being flush with the upper edge of the cap top, whereby a long surface for the application of a solder for the attachment of a spout to the can top may be provided.

Another feature of difference is that the said annular bead does not extend into the can top opening, and therefore, when a sealing disk is not used, a positive metal to metal contact is assured, which is not true on indented caps. By this arrangement also, when the cap without insert is tightened on the top, the inward edge of the sealing flange is bent downwardly and a spring action between the flange and cap is effected.

Again, when a sealing disk is inserted and the cap is tightened in the can body, the inward edge of the top is bent downwardly and a rounded V-shaped sealing bead is formed at the outer annual edge of the flange, this edge being imbedded in the sealing disk.

Furthermore, this feature of using the annular bead, bearing first on the flange and then bending the burr edge downwardly and away from contact with the sealing gasket prevents the formation of leaks which, in the previous form of can top were likely to be caused because of the danger of cutting the inner sealing edges by the burr formed at the inner edge of the sealing flange.

The invention, therefore, consists in the matters hereinafter described and referred to in the appended claims, constituting the improvements on the said above mentioned patent.

In the accompanying drawings which illustrate the invention—

Figure 1 is a front view in section of a metal container provided with double spring sealing cap constructed in accordance with my invention, and showing the sealing disk therein;

Fig. 2 is a similar view showing the relation of the parts after the cap has been secured into position;

Fig. 3 is a view similar to Fig. 1, with the sealing disk omitted;

Fig. 4 is a view similar to Fig. 2, with the sealing disk omitted;

Fig. 5 represents the can top, with a pouring spout attached thereto.

Referring in detail to the drawings, I have shown in Fig. 1 a metal container 1, having the mouth or top portion 2 thereof of smaller diameter than the body, this mouth portion being formed with a screw thread. For closing the container, I have provided a metal cap 3 formed with a depending flange 4, extending down over the top portion and having a screw thread therein adapted to engage with the screw thread on the mouth of the container, and having an annular bead 6 in its under surface.

At the mouth of the container there is an inwardly projecting flange 5, horizontal, as shown in Fig. 1. Between the bead 6 and

the edge of the top a channel 10 is thus formed which is less in width than the flange 5.

Located within the cap is a sealing disk 5 which preferably consists of a padding 7, having a facing of some soft metal, such as lead. The sealing disk is of substantially the same diameter as the internal diameter of the cap, or slightly greater than the internal diameter, so as to be frictionally gripped and held within the cap. When said disk is placed in the cap, it is substantially flat and unbent, as shown in Fig. 1.

When the cap is screwed onto the container, the annular bead or rib 6 is imbedded in the sealing disk, as shown in Fig. 2, and the flange 5 yields to the pressure of securing the top onto the can body, the sealing disk is dished slightly downwardly, as shown in Figure 2, and a secure and complete sealing is accomplished. As the annular rib or bead is so located on the cap, as to be in a plane between the inner edge of the flange 5—i. e., the channel 10 is narrower than the flange 5 and the body portion 2, it may as shown in Figs. 3 and 4, be used without a sealing disk and a tight metal to metal seal be made.

When the cap carrying the gasket is screwed tightly onto the flange, it deforms the latter and the movement effects a grinding action between the flange and gasket, thus resulting in a ground conical valve seat.

As shown in Fig. 5, by the use of the annular bead 6, the upper surface of the cap 3 does not have to be dished inwardly, but may be left in the same plane with the outer periphery, and, therefore, affords an extended flat surface for the attachment of the usual oil or insecticide spout and cap 9, which in use sometimes accompanies such container.

By way of recapitulation the following features of the present invention may be pointed out.

When the cap 3 is used without the sealing disk 7, the annular bead 6 of said cap will engage the upper surface of the flange 5 of the container intermediate of the inner and outer peripheries of said flange. A positive annular metal to metal contact will be had between said bead and the upper surface of said flange. When the cap is screwed down upon the container, said bead 6 will bend the flange 5 downwardly, and a spring action between the flange and cap is effected. The bead 6 will grind itself in a conical seat against the conically shaped flange 5, producing a number of sealing rings. As clearly shown in the drawing, said flange 5 is straight in cross section, having no crimps, or beads, or other reinforcing conformation, to prevent deformation.

Said downward bending, as clearly shown in Figures 2 and 4, produces a rounded V-shaped sealing bend at the outer annular edge of the sealing flange 5. The outer periphery of the flange 5 will, when the sealing disk 7 is provided, create a distinct impression in said sealing disk and effect a positive seal at this region of contact.

In the manufacture of containers, the edge portion of the opening thereof is likely to be left with a burr. For example, in the manufacture of containers having an inwardly extending flange such as the flange 5 disclosed in the present application, there is danger that when the cap is screwed down to its home position there will be a cutting action between said burr and either said cap or such sealing disk as may be used, resulting in leakage. According to the present invention no such action is possible, however, inasmuch as the force in bending down the flange 5 is applied not at the inner periphery of said flange 5 but at a region between the inner and outer peripheries of said flange. The inner periphery carrying the burr edge is, therefore, bent downwardly, away from contact with the cap 3 and sealing disk 7.

In cases wherein the sealing disk 7 is used, the annular bead on the top of the cap 3 produces an annular compression or compact, thereby effecting an added seal by preventing leaks due to seepage.

By reason of the conical seat seal provided, leakage from the container is effectually prevented, it being possible to effect a tight contact between the conical surfaces. The conical seal is effective also for the reason that seepage would in the normal position of the containers have to occur against the force of gravity.

It will be noted that fluids in order to escape from the container embodying the principles of the present invention must escape past the metal to metal fit of the bead 3 of the cap against the flange 5 of the container. It must also pass through the sealing rings formed when the metal of the bead 3 of the sealing disk 7 is ground to a seat on the conical flange 7, and must work uphill, and finally must pass through the compact effected by the bearing of the bead 3 upon the sealing disk 7.

With the beaded cap as disclosed, the center portion of the top, raised to the same level as the outer edge of the cap, fills in most of the space centrally of the top of said cap and greatly minimizes the time and labor cost of attaching the spout 9 to said cap. The quantity of solder required is substantially reduced, and a stronger and better combination of spout and cap results.

Having thus described my invention, what

I claim as new and desire to secure by Letters Patent, is:

1. A container having an opening, a deformable annular flange, straight in cross section, defining the boundary of said opening, and a closure for said container, said closure being provided with an annular bead adapted to exert force against said flange at a region spaced slightly from the boundary of said opening and adapted to bend said flange inwardly to provide a conical seat.

2. A metal container having a screw-threaded portion providing an opening, said portion being provided with a deformable flange, straight in cross section, bounding said opening, and a screw-threaded cap cooperating with said screw-threaded portion, said cap being provided with an annular bead adapted to exert force against the surface of said flange at a region spaced slightly from said opening.

3. A metallic container having a portion providing an opening, said portion having a deformable annular flange, straight in cross section, bounding said opening, and a cap adapted to be forced into holding engagement with said portion, said cap being provided with an annular bead adapted to exert force against said flange at a region spaced from the free edge of said flange.

4. In combination, a container having a

portion providing an opening, said portion being provided with a deformable annular flange, straight in cross section, having a free edge, and a cap having holding engagement with said portion, said cap having a substantially flat top but being provided with an annular bead adapted to exert force against said flange at a region spaced slightly from the free edge of said flange.

5. In combination, a member providing an opening, said member having a deformable flange, straight in cross section, bounding said opening, said flange having a free edge, and a closure having holding engagement with said portion, said closure being provided with an annular bead adapted to exert force against said flange at a region spaced slightly from said free edge.

6. In combination, a member providing an opening, said member having a deformable flange, straight in cross section, bounding said opening, said flange having a free edge, a closure having holding engagement with said portion, said closure being provided with an annular bead adapted to exert force against said flange at a region spaced slightly from said free edge, and a compressible sealing member within said closure between said bead and said flange.

In testimony whereof, I affix my signature.

JOHN F. McGARRAHAN.