June 15, 1926. 1,588,652

F. A. BROWN

CAP FOR RECEPTACLES

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Fig. 1

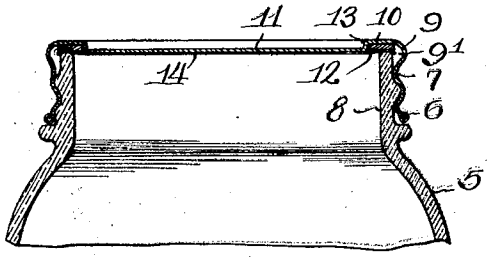


Fig. 2

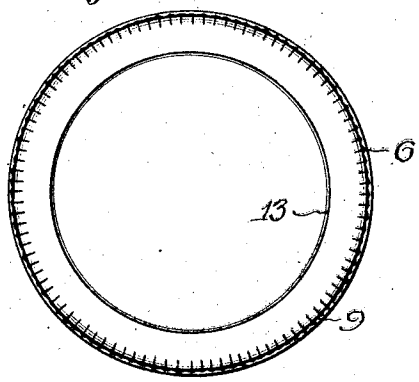
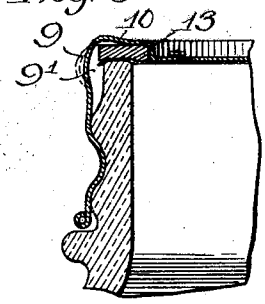


Fig. 3



Inventor:
Frank A. Brown
By: Wm. O. Bel
Atty.

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FRANK A. BROWN, OF CHICAGO, ILLINOIS.

CAP FOR RECEPTACLES.

Application filed August 18, 1924. Serial No. 732,600.

This invention relates to improvements in metal caps for sealing jars, bottles, and other receptacles, and its objects are primarily to provide a cap which can be tightly applied to the receptacle for forming an air tight seal, which will reduce the air space in the top of the receptacle, and which can be easily removed without damage to the receptacle.

My invention relates to that class of metal caps which are provided with a screw thread for engagement with a complementary thread on the receptacle and which may be provided with an oiled paper disk to protect the cap from contact with the contents of the receptacle so that when the cap is removed it will present a clean and sightly appearance. It is customary to apply screw metal caps to the receptacles by hand or by machine with sufficient force to clamp the cap against the mouth of the receptacle tightly enough to form a liquid and air tight seal. A cardboard disk has been inserted in the cap to be clamped between the cap and the receptacle for forming the seal but these disks are objectionable to some extent and for some purposes, because they are liable to absorb moisture before being used which is imparted to the contents of the receptacle, and they also preclude the use of processes for sterilizing the contents of the receptacle.

Considerable force is customarily employed in applying caps and the cap is often applied so tightly that much difficulty is experienced in removing it when desired. This difficulty is encountered more particularly by the housewife who often lacks sufficient strength to remove the cap and who is not equipped with any satisfactory mechanical means for this purpose or, if so equipped, is not skilled in the use thereof.

In Letters Patent No. 1,463,145, patented July 24, 1923, to me as the assignee of the inventor, William E. Koss, a cap is disclosed having an outwardly extending peripheral hollow bead at the top of the threaded flange so that a blow on the bead will tend to break the sticking seal which is ordinarily present in a tightly applied cap and permit the cap to be easily removed. It does not require a heavy blow but a light blow repeated at intervals about the cap will be sufficient to release the cap from a sticking seal. These patened caps have been commercially used in large quantities with complete success.

My invention retains the benefits and advantages of the patented cap and also presents certain improvements thereon and refinements thereof which better adapt the cap for general commercial use and produce superior results.

In the accompanying drawings I have illustrated a selected embodiment of the invention and referring thereto:—

Fig. 1 is a sectional view showing a portion of a glass jar with the cap applied thereto.

Fig. 2 is a top plan view of the cap.

Fig. 3 is a detail enlarged sectional view indicating the approximate results of tapping the bead of the cap for the purpose of breaking a sticking seal.

Referring to the drawings, 5 designates a glass jar and 6 is a cap having a depending flange 7 threaded to receive the exteriorly threaded neck 8 of the jar. At the top of the flange there is a peripheral hollow bead 9 and adjacent this bead there is in the top of the cap a peripheral groove or seat 10 formed by depressing the top at 11. This peripheral seat is arranged to be located opposite the edge of the mouth of the jar and a flat rubber seal 12 is seated in the seat and against the shoulder 13 between the seat and the depression 11 so that it will properly engage the edge of the mouth of the jar to seal the same. An oiled paper disk 14 may be interposed between the cap and the mouth of the jar to protect the cap against the contents of the jar and so that when the cap is removed it will present a clean and sightly appearance.

The depression in the top of the cap forms the seat for the rubber seal which is preferably of a size to fit in the seat against the shoulder 13. This depression not only forms the seat and the shoulder but it also reduces the air space at the top of the jar, and this is of considerable importance. The danger of the contents of the jar spoiling increases as the size of the air space at the top of the jar increases and anything that can be done to reduce this air space is importance because to that extent it reduces the danger of the contents spoiling. Even if the jar were completely filled there would be some air space between the contents and the cap because of the interposition of a sealing means between the edge of the mouth of the jar and the cap, but by depressing the top of the cap within the effective sealing area I eliminate just that

much of the air space ordinarily left in the jar. In other words, with my improved cap I reduce the air space in the top of the jar by that amount which was ordinarily provided between the edge of the mouth of the jar and the cap. If a jar is completely filled and my improved cap applied, there will be no air space in the top of the jar because the depression 11 in the top of the cap eliminates that space which is ordinarily left in the jar above the contents by reason of the spacing of the top of the cap from the edge of the mouth of the jar by the sealing means. I employ the sealing means but I depress the top of the cap within the sealing area so that it will engage the oiled disk 14 with the latter lying on the edge of the mouth of the jar and against the contents therein.

The bead 9 is located beyond the seat 10 and it provides an annular groove 9′ which is preferably continuous and forms an air chamber just outside of the seat 10 and above the screw threads in the neck of the jar and in the cap. If a cap is so tightly applied to the jar that it can not be easily removed manually by unscrewing, it can be loosened to release the sticking seal by tapping the bead with any instrument or against a table or some other object. It is not generally necessary to tap the cap sufficiently hard to produce noticeable distortion, but light tapping at intervals around the bead is ordinarily sufficient to break the sticking seal so that the cap can be easily unscrewed. This light tapping may not produce a noticeable distortion, but it is believed that some degree of distortion will inevitably result since the caps are made of relatively thin metal, and in Fig. 3 I have indicated a degree of distortion which may result from tapping and I have made it sufficiently noticeable to show the effect of tapping. It is quite likely that Fig. 3 shows a degree of distortion which would not ordinarily be required or be observed in actual practice, but it will more clearly illustrate this feature of the invention. When the bead is tapped it tends to flatten, the lines of force being exerted downward against the first screw thread in the flange of the cap and forward against the seat. Since the metal can not give in either direction the seat must lift up, as shown in Fig. 3, thus releasing the sticking seal and permitting the cap to be easily unscrewed. The shoulder 13, like the first thread on the flange, resists and localizes the force of the blow to a limited area of the top and compels the seat to lift in the manner illustrated. This lifting may not be perceptible to the eye and it is not necessary that it should be; it is only necessary that the sticking seal which prevents the cap from being unscrewed be broken. It is not necessary that this sticking seal should be broken throughout the length of the seat and for that reason the cap need only be tapped at intervals spaced considerably apart, but this is a matter of degree and sometimes more tapping will be required than at other times because the cap sticks tighter in some places and it must be tapped accordingly to loosen.

I have not shown a cardboard disk which is very commonly employed in caps for sealing jars and the like, because I do not find it necessary to use this disk and prefer not to do so. I find that the rubber seal forms a perfect seal when the cap is tightly applied to the jar and that the cardboard disk is not necessary. If it is desired to use the cardboard disk it may be located between the oiled paper disk 14 and the cap and rubber seal.

My invention provides a cap which can be made at low cost with great rapidity on machines now employed for making caps and without material change. It can be applied tightly to a jar to insure a perfect seal and is capable of being easily removed. The top of the cap provides a smooth surface which permits a plurality of jars to be stacked one upon the other in convenient fashion and it presents no sharp edges or projections which might be objectionable for various reasons. The depression in the top of the cap within the sealing area is important because it materially reduces the air space in the top of the jar and this is accomplished without reducing the capacity of the jar and without adding to the difficulties of manufacture or detracting from the other features of the cap.

I have found it convenient to use a rubber sealing ring which fits snugly in the seat and engages the shoulder 13 sufficiently to be held in place in handling and even in shipment. This ring need only be of sufficient width to sealingly engage the edge of the mouth of the jar and ordinarily it will not project to any material extent beyond the edge of the jar and consequently will not fill the air chamber formed by the bead; but even if it should project beyond the edge of the mouth of the jar, and even if it should extend into or even partly fill the air chamber, it will not be objectionable because it is sufficiently soft to yield with the cap to any tapping to which the cap would be subjected.

To adapt the invention for different receptacles it may be necessary to make various changes in the form, construction and arrangement of parts and I reserve the right to make all such changes as fairly fall within the scope of the accompanying claims.

I claim:—

1. A sheet metal screw cap for receptacles comprising a top and a depending screw threaded metallic flange, there being an out-

wardly directed hollow bead extending peripherally in the flange between the topmost thread thereof and the top of the flange, whereby deformation of the bead by a blow thereon will displace an adjacent portion of the top of the cap, said cap also being provided in its underside with an annular packing receiving groove having a wall disposed in cooperative relation with the bead to localize the effect of a blow on the bead to the top portion between the bead and said wall.

2. A sheet metal screw cap for receptacles comprising a top and a depending screw threaded metallic flange, there being an outwardly directed hollow bead extending peripherally in the flange between the topmost thread thereof and the top of the flange, whereby deformation of the bead by a blow thereon will displace an adjacent portion of the top of the cap, the top of the cap being provided with a concentric depressed portion defining a packing receiving groove extending around the outer periphery of the depressed portion, said groove having a wall disposed in cooperative relation with the bead to localize the effect of a blow on the bead to the top portion between the bead and said wall.

3. A receptacle having a cylindrical externally screw threaded neck, a sheet metal cap including a top and a cylindrical screw threaded flange embracing the neck of the receptacle and provided on its underside with an annular groove in alignment with the top of the neck, and a packing in said groove and cooperating with the top of the neck, there being an outwardly directed hollow bead extending peripherally in the flange and located between the topmost thread thereof and the top of the flange, whereby deformation of the bead by a blow thereon will displace an adjacent portion of the top of the cap, said groove having a wall disposed in cooperative relation with the bead to localize the effect of a blow on the bead to the top portion between the bead and said wall.

4. A sheet metal screw cap for receptacles comprising a top and a depending screw threaded metallic flange, there being an outwardly directed hollow bead extending peripherally in the flange between the topmost thread thereof and the top of the flange, whereby deformation of the bead by a blow thereon will displace an adjacent portion of the top of the cap, the top of the cap being centrally depressed, the upstanding peripheral wall of the depressed portion and the bead defining an annular packing receiving groove in communication with the interior of the hollow bead, said wall being disposed in cooperative relation with the bead to localize the effect of a blow on the bead to the top portion between the bead and said wall.

FRANK A. BROWN.