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W. E. KOSS

CAP FOR RECEPTACLES

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Fig. 1

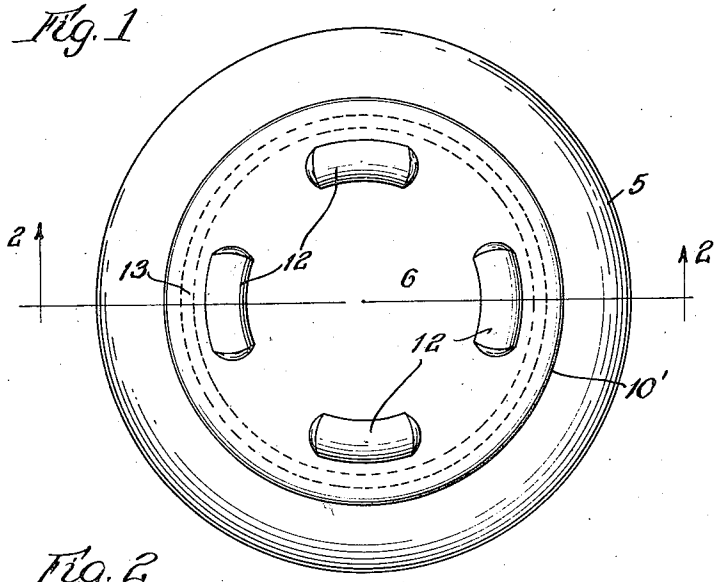


Fig. 2

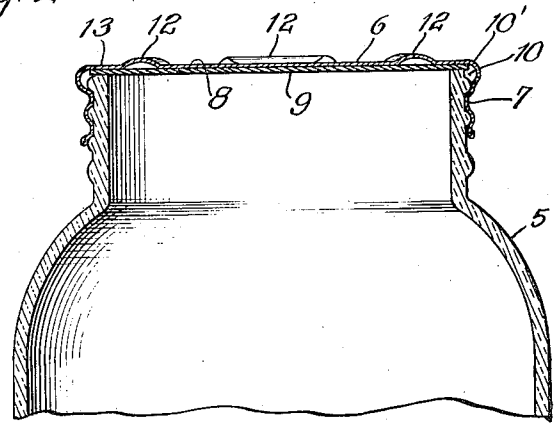
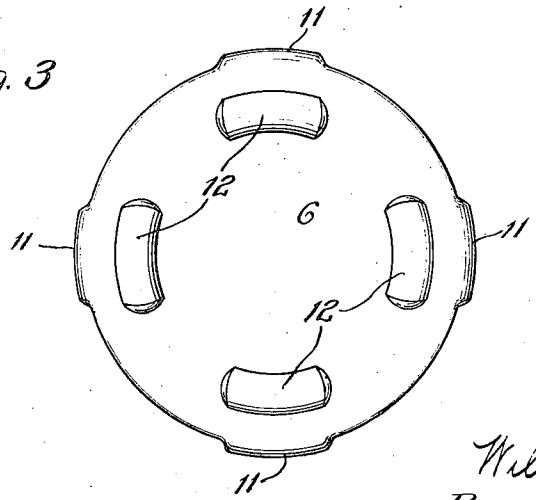


Fig. 3



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UNITED STATES PATENT OFFICE.

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CAP FOR RECEPTACLES.

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To all whom it may concern:

Be it known that I, WILLIAM E. KOSS, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Caps for Receptacles, of which the following is a specification.

This invention relates to improvements in caps which are usually made of metal for sealing jars, bottles and other receptacles, and its object is to enable the cap to be tightly applied to the receptacle and easily removed therefrom.

It is customary at the present time to provide metal caps with a sealing disk and with a screw thread for engagement with a complementary thread on the receptacle, and to apply the cap to the receptacle by hand or by machine with sufficient force to clamp the disk against the edge of the receptacle tightly enough to seal the receptacle.

To provide an effective seal it is customary to employ considerable force in applying the cap and for this reason, and also because the dimensions of the caps and of the threaded neck of the receptacles vary more or less, it often happens that the cap is applied so tightly to the receptacle 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.

When the cap is tightly applied to the receptacle the greatest effort is required in removing the cap at the beginning of the operation in order to break the seal between the disk and the mouth of the receptacle, and at the same time to loosen the threaded engagement between the cap and the receptacle sufficiently to permit the cap to be unscrewed. I have found that if this sealing engagement between the disk and the receptacle is broken the removal of the cap, even when it is very tightly applied, becomes comparatively easy.

My invention is directed primarily to the provision of a cap which can be applied as tightly as may be desired to effectively seal a receptacle and which is constructed to enable the seal to be easily broken or loosened without the application of any mechanical appliances.

And a further object of the invention is to construct the cap for use as indicated above and so that it can be used to close the jar after having been removed therefrom.

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

Fig. 1 is a top plan view showing the cap applied to a jar;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a top plan view of a slightly modified form of cap.

Referring to the drawings 5 designates a jar indicating a receptacle of any suitable size, shape and configuration adapted to receive a cap 6 suitably shaped to fit the receptacle and having screw threaded engagement therewith at 7. Any suitable means for providing a seal between the cap and the receptacle may be employed and for illustration I have shown a seal comprising a card board disk 8 having a paper cover 9. The paper cover is generally paraffined or otherwise treated to facilitate the formation of an air tight, liquid tight seal, and the card board disk may be likewise treated if desired. Disks of other material, such as felt, rubber, or cork, or ordinary rubber rings, may be used. The caps are applied very tightly to the receptacles by hand or by machines to force and hold the sealing disk tightly against the edge of the receptacle at the mouth thereof and provide an air tight, liquid tight seal. These caps are largely used on jars containing jellies, preserves, pickles, olives and other food products and sometimes great difficulty is encountered in removing the cap.

I provide my cap with an annular groove 10 formed by a bead 10′ in the side adjacent the top of the cap and I prefer that this groove be made continuous, as shown in Fig. 2, for convenience and economy in manufacture, but satisfactory results may be obtained if the groove is made discontinuous in the form of a plurality of short grooves formed by short beads or bulges 11 disconnected from each other but extending around the cap in the same position as the continuous groove 10. The groove forms a continuous air chamber in the con-

struction of Fig. 2, or a plurality of air chambers, in the construction of Fig. 3 at the corner formed by the juncture of the side and top of the cap and this air chamber is disposed peripherally around the edge of the sealing joint between the cap and the receptacle in the form illustrated. The grooved air chamber is provided to facilitate the removal of a tightly secured cap and said removal is accomplished by tapping the cap upon the bead forming the groove. The cap may be tapped with any instrument or it may be tapped against some object, such as a table, with sufficient force to lift the top of the cap slightly adjacent the part which is tapped. It may be that tapping at one spot will be sufficient to loosen the seal, or it may be necessary to tap the cap at more than one spot for this purpose, depending upon the tightness and condition of the seal; but when the seal is sufficiently loosened in this manner the cap can be readily removed. It is not necessary to the effective use of my invention that the seal between the disk and the receptacle should be completely broken entirely along the edge of the receptacle because I have found in practice that breaking the seal, or loosening the cap at one or more places will be sufficient to enable the cap to be easily removed. I have also found in actual use of caps embodying my invention that tapping them on the floor or on a table or other convenient object sometimes results in indenting the bead forming the groove to a noticeable extent, because the cap metal is of thin gauge; and in such cases the cap can be used again for closing the jar but it may not make a very effective seal. However, it is not necessary to mutilate the cap in order to remove it since a comparatively light tapping will loosen the seal and enable removal of the cap.

I believe that the displacement of the air in the groove when the cap is tapped as described helps to loosen the seal but to what extent I have not yet been able to determine. It seems to me that the air is forced between the top of the cap and the disk and between the disk and the edge of the jar and, of course, to the extent that it is so forced between these parts it will loosen the seal. But it appears that the top of the cap is lifted adjacent the bead forming the groove 10 from the disk, or at least its clamping action upon the disk is released, sufficiently to loosen or break the seal. When the bead is tapped it may be depressed or indented but a certain amount of leverage will be exerted against the top of the cap to loosen its clamping engagement with the disk, and this is promoted by the rigidity with which the side of the cap is threadedly engaged with the neck of the jar.

I prefer to provide one or more elongated bulges 12 on the top of the cap which are disposed adjacent the bead preferably in parallel relation with the bead but the number, size, shape and arrangement of these bulges or projections may be changed as found desirable. The bulges 12 are sufficiently removed from the bead to provide an annular flat clamping section which will be disposed directly above the edge forming the mouth of the jar when the cap is applied to the jar, as shown in Fig. 2. It is contemplated to apply a legend upon the cap directing the user to tap the bead opposite one or more of the bulges and besides indicating where the bead should be tapped these bulges constitute a buffer or back stop to receive the blow of tapping and tend to localize the lifting effect of a blow on the head 10′ to the flat clamping section 13 of the top of the cap between the bulge and the tapped part of the bead. In other words by providing the bulges at the inner edge of the flat clamping section 13 of the top, which is bounded on its outer edge by the bead, I provide a stop to limit the distribution of the force of the tapping blow to that portion of the top between the tapped part of the bead and the oppositely disposed bulge, whereby a very slight blow will cause sufficient displacement of the clamping part of the top, due to this concentration of the force of the blow, to loosen the seal. I have found in some cases that it is sufficient to tap opposite one bulge only and in other cases that tapping opposite more than one bulge is required, but this will depend very largely upon the force of the blow. I am unable to give any more definite information because of the difficulties involved in attempting to seal a plurality of jars precisely alike to make comparative tests. I do know, however, that very light tapping will be sufficient to loosen a cap so it can be easily removed when it was impossible to remove the cap by hand in repeated trials. And by experience I am able to say that I believe my invention will enable the removal of any cap applied by hand or by machine and sealed in the usual way and under any usual conditions, and that this can be accomplished by surprisingly little tapping. I have illustrated the invention in embodiments which I have found by repeated tests to be satisfactory and while it may prove of some difficulty to make the cap of Fig. 3 economically and by automatic machinery I know that the cap of Figs. 1 and 2 can be so made with very little if any additional cost over caps now on the market.

I prefer to locate the bead and the air chamber at the juncture of the side with the top of the cap, as shown, and it may be made continuous or discontinuous, but in either case there will be a substantial length of bead and groove sufficient for the purpose.

The bulges 12 may or may not be used with the discontinuous bead 11 of Fig. 3, as desired. I prefer that the continuous bead and the discontinuous bead be made in or about the manner shown in which the groove is of substantially the same dimensions throughout its length, but this may not be essential and the groove may be made to taper from its middle to its ends, in the discontinuous form, or it may be undulating, that is to say tapered in some parts more than in others, if desired.

I am aware that changes in the form, construction and arrangement of parts may be made without departing from the spirit or sacrificing the advantages of the invention and I reserve the right to make all such changes as fairly fall within the scope of the following claims.

I claim:

1. A sheet metal screw cap for receptacles comprising a top and a depending screw threaded flange, there being an outwardly directed hollow bead extending peripherally in the flange between the topmost thread thereof and the top of the cap, whereby deformation of the bead by a blow thereon will displace an adjacent portion of the top of the cap, substantially as and for the purpose set forth.

2. A sheet metal screw cap for receptacles, comprising a top and a depending screw threaded flange, there being an outwardly directed hollow bead extending peripherally in the flange between the topmost thread thereof and the top of the cap and at the juncture of the cap top and flange, whereby deformation of the bead by a blow thereon will displace an adjacent portion of the top of the cap, and the cap top having a bulge forming an abutment 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 the abutment, substantially as and for the purpose set forth.

3. A sheet metal screw cap for receptacles, comprising a top and a depending screw threaded flange, there being an outwardly directed hollow bead formed in and extending entirely around the flange and located between the topmost thread thereof and the top of the cap and at the juncture of the cap top and flange, whereby deformation of the bead by a blow thereon will displace an adjacent portion of the top of the cap, and the cap top having an annular series of bulges forming abutments disposed in cooperative relation with the bead to localize the effect of a blow on the bead to the cap top portion between the bead and one of the abutments, substantially as and for the purpose set forth.

4. 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 a sealing element gripped between the top of the cap and the top of the neck, there being an outwardly directed hollow bead extending peripherally in the flange and between the topmost thread thereof and the top of the cap, whereby deformation of the bead by a blow thereon will displace an adjacent portion of the top of the cap, substantially as and for the purpose set forth.

5. 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, a sealing element gripped between the top of the cap and the top of the neck, there being an outwardly directed hollow bead extending peripherally in the flange between the topmost thread thereof and the top of the cap and at the juncture of the cap top and flange, whereby deformation of the bead by a blow thereon will displace an adjacent portion of the top of the cap, and the top of the cap having a bulge forming an abutment disposed in cooperative relation with the bead and located adjacent the inner edge of the sealing area to localize the effect of the blow on the bead, substantially as and for the purpose set forth.

6. 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 a sealing element gripped between the top of the cap and the top of the neck, there being an outwardly directed hollow bead extending peripherally in the flange between the topmost thread thereof and the top of the cap and immediately adjacent the cap top, whereby deformation of the bead by a blow thereon will displace an adjacent portion of the top of the cap, substantially as and for the purpose set forth.

WILLIAM E. KOSS.