

May 9, 1933.

C. E. McMANUS

1,907,994

CAP

Filed Oct. 1, 1931

Fig. 1.

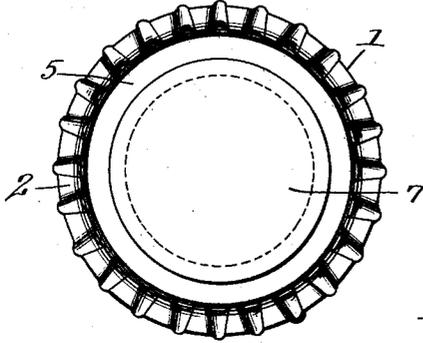


Fig. 2.

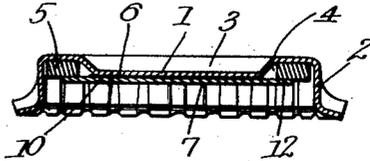


Fig. 3.

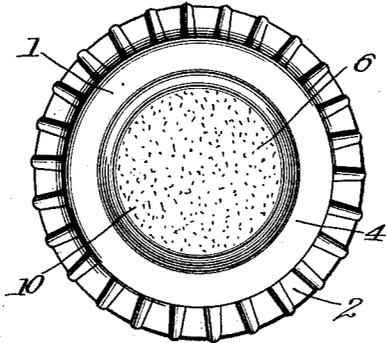


Fig. 7.

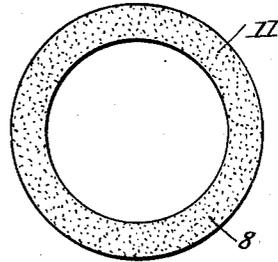


Fig. 6.

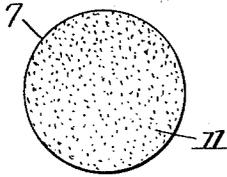


Fig. 4.

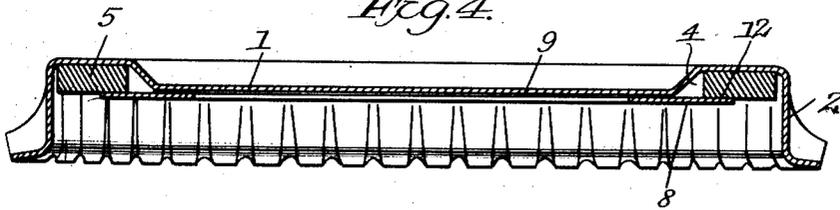
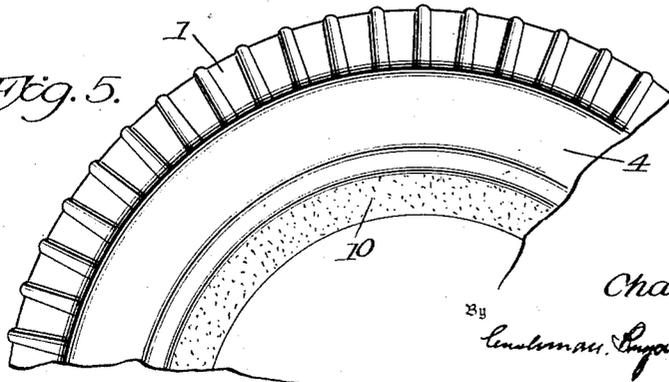


Fig. 5.



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UNITED STATES PATENT OFFICE

CHARLES EDWARD McMANUS, OF BALTIMORE, MARYLAND, ASSIGNOR TO CROWN CORK & SEAL COMPANY, INC., OF BALTIMORE, MARYLAND, A CORPORATION OF NEW YORK

CAP

Application filed October 1, 1931. Serial No. 566,341.

My invention relates to caps for containers and particularly contemplates a cap wherein a sealing ring or cushion is usually employed.

It is quite common in caps of this character to indent the top of the cap and form a circular groove between the indented portion and the skirt within which the sealing ring or cushion is disposed.

In previous constructions, however, it has been necessary to unite by a suitable adhesive the sealing ring to the cap. Such a procedure requires the use of an adhesive, as well as the step of applying the same and of affixing the ring. Moreover, whether such ring be performed and united by a separate adhesive or comprise some composition possessing a tacky nature by which it is secured to the cap, it is often found that by reason of the lacquer and other finish on the cap, that the adhesive union is imperfect and also there is a possibility of the adhesive, as well as the ring, coming in contact with the contents of a vessel to produce contamination, bad taste and other deleterious consequences.

With the present invention it is preferred that the sealing ring be simply loosely disposed in the ring groove of the cap or held therein by friction without the use of any adhesive action or the step of producing an adhesive union. Furthermore, it is proposed to employ a liner in the form of a spot center or ring which, in the event the sealing ring is adhesively united, will form a protecting surface between the contents of the vessel and the ring.

Primarily, the spot center or ring liner will serve whether the ring be adhesively or non-adhesively united to the cap to confine the ring in position, so that, in fact, it is unnecessary to adhesively unite the ring or resort to the expensive steps required for such a procedure.

Therefore, the invention comprises the applying of a sealing ring to the usual indented cap and affixing directly to the undersurface of the cap a spot or ring liner which will overlie the sealing ring and retain it in position.

In the drawing:

Figure 1 is a bottom plan view showing a spot liner.

Figure 2 is a section on the line 2—2 of Figure 1.

Figure 3 is a bottom plan view showing an adhesive coating on the undersurface of the indented portion of the cap.

Figure 4 is a sectional view similar to Figure 2, but showing a ring liner applied to the indented portion of the cap.

Figure 5 is a bottom plan view partially broken away, showing a stratum of adhesive applied circumferentially to the undersurface of the indented portion.

Figure 6 is a view showing a spot liner provided with a coating or film of adhesive, and

Figure 7 is a view showing a ring liner having its surface covered with a coating or film of adhesive.

In carrying out the invention, the cap is indicated as a whole at 1, in Figures 1 and 4. The cap is provided with a skirt 2, which, in the present instance, is illustrated as being crimped, but which, in fact, may be of any desired form, since the invention can be employed with the various types of conventional caps well known in the art.

The top of the cap is indented as shown at 3 and such indentation is of circular contour and is disposed centrally of the top of the closure. The space between the wall of the indentation and the wall of the skirt defines a groove 4 within which is disposed a sealing cushion 5. The cushion or ring 5 is preferably of such thickness that its surface will be substantially flush with the surface of the indented portion, whereby the two surfaces lie in substantially a common plane; this is clearly illustrated in Figs. 2 and 4 of the drawing.

Affixed directly to the undersurface 6 of the indentation is a spot liner 7, shown in Figure 1, or a ring liner 8, shown in Figure 4. The spot liner or ring liner is of a diameter greater than the area of the undersurface of the indentation, so that the circumferential edge of the liner will extend beyond the indentation and overlie the sealing ring 5. The area of the liner may be varied, so that the overlapping relation may be obtained to a greater or less degree.

As stated, the liner is affixed directly to the undersurface of the indentation and this may

be accomplished in several ways. For example, the undersurface of the cap may be provided with a suitable adhesive, as shown in Figures 3 and 5, or the liner itself may have a coating or film of suitable adhesive, as shown in Figures 6 and 7.

It will be understood from the description thus far that the sealing ring 5 may be non-adhesively disposed in the groove 4 and by reason of the securing of the liner to the cap, and its overlapping of the ring, the ring will be effectively held in position. Since the surface of the indented portion is substantially flush or in the same plane with the surface of the sealing ring 5, the liner, whether it be a ring, as shown in Fig. 4 or a spot liner as shown in Fig. 1, is not flexed along a circumferential or circular line, but is maintained smooth, as illustrated in Figs. 2 and 4. When the cap is applied the margin of the liner overlying the sealing ring will be depressed slightly, due to compression of the sealing ring, but the portion of the liner inwardly from the sealing ring will be maintained in position by the indented portion of the cap, and will serve as an effective means for protecting the cushion liner from the bottle contents.

Where the adhesive is applied directly to the undersurface 6 of the indentation, the liner may be only affixed to the cap, but in many cases the adhesive will have a tendency to flow or by reason of capillary attraction spread along the undersurface of the liner, so that the liner will also be united to the sealing ring 5 at the point of overlapping engagement of the two members.

Whereas, in Figures 6 and 7, the adhesive area is co-extensive with the area of the liner, the liner will be affixed to the undersurface of the indentation and to the ring as well.

The principal purpose of the construction is to eliminate the step of adhesively uniting the ring to the cap and to avoid any possibility of the contents of a vessel contacting with the ring, since it will be observed that the liner whether it be a spot center or a ring liner, will effectively bridge the portion between the ring and the indentation and it is proposed that the liner shall contact with the sealing edge of the container to which the cap is applied.

By eliminating the step of adhesively uniting the ring to the liner, it is possible to manufacture the caps at much less cost and to even more perfectly assure that the contents of a container will not be deleteriously affected.

The cap of the present invention may be constructed of metal, paper or other composition material, although it is customary to employ a metal cap and the invention is preferably applied to such a material.

It is customary to give the metal from which the caps are stamped a preliminary

lacquering or finish and at this point it may be stated that while such lacquer or coating is usually one which will not contaminate or affect the contents of a container where the sealing ring is adhesively united, there is always the problem of finding some adhesive which will be satisfactory. By the present invention, this problem is effectively solved.

The spot center or ring liner as will be clear, is united to the lacquered metal undersurface of the cap. In the case of the spot center, no difficulty arises from the nature of the metal finish and clearly the metal need not be finished or any usual lacquer may be employed, since the liner effectively protects the contents of a vessel from contact with the undersurface of the cap.

In the case of a ring liner, however, where the contents will contact with the undersurface 9 of the cap, some suitable lacquer must be employed which will be inert with respect to the contents of the container.

The liner employed may consist of a metallic substance such as tin foil or comprise a fibrous material such as paper. In the case of paper, the exposed surface of the liner will preferably be coated with a layer of varnish which will be inert to the contents of the container and in the case of metal foil, this should be used where it will likewise be inert with respect to the material which is being bottled.

It will be clear, therefore, that the liner of the present invention is affixed directly to the finished or unfinished undersurface of the indented portion of the cap and that it is unnecessary to resort to any other complicated steps than those which are ordinarily required for the protection of the goods being packaged.

I have discovered that several adhesives can be employed to advantage in my present construction and while any suitable adhesive may be used, I prefer one which will be substantially inert with respect to the substances in a container.

In carrying out the process, the sealing ring is preferably non-adhesively disposed in the groove 4 and thereafter a drop of proteid adhesive such as albumen which will agglutinate under heat and pressure is placed on the undersurface 6, as shown in Figure 3. The spot or liner material will preferably be stamped from a strip of material and simultaneously pressed into contact with the indented portion 6 and the peripheral edge of the sealing ring 4. As will be understood, the plunger may be heated, or a cold plunger may be employed and the cap externally heated to produce the desired fixation of the liner to the cap and to the ring. In some cases, where the adhesive does not spread to the outer peripheral edge of the liner, but the ring itself has an adhesive characteristic, the application under heat and pressure will

cause the liner and ring to be united along their overlapping portions. This will depend, of course, upon the composition of the ring which may be of rubber, a rubber composition, cork, a cork composition such as resinated cork or a rubber mixture which will be flowed into the groove 4 and either permitted to harden or become plastic therein or vulcanized in the groove.

10 Instead of applying a drop of albumen to the undersurface 6 of the cap and causing it to spread upon the application of a liner thereto under heat and pressure, I may provide the area of the undersurface with a suitable adhesive lacquer which will be fusible under a low heat. The liner will be applied in the same manner just described, namely by stamping from a strip of material and either using a heated plunger or a cold plunger with a hot cap to secure the liner to the indented undersurface and the ring.

I also have found it highly satisfactory, and for some purposes prefer, that the strip liner material in addition to having its exposed surface coated with a varnish or other film which will be inert to the contents of the vessel, shall have its undersurface coated with a suitable adhesive, preferably one which will be fusible under a low heat. Thus, I may use a liner strip material having its undersurface coated with a thin stratum of gutta percha composition or a lacquer such as was previously described as being applied to the area of the indented portion of the cap. The process of applying will be similar to that previously described and it will be clear that where the strip material is preliminarily coated or provided with an adhesive film that such adhesive area will be co-extensive with the liner and will unite the liner both to the indented area 6, as well as the adjacent peripheral edge of the sealing ring 5.

It will be understood that where a metal foil strip liner material is employed, that its undersurface will be coated with a suitable adhesive such as gutta percha or lacquer fusible under a low heat.

In addition to the materials described for the liner, I may also and preferably will, in some cases, utilize the liner material set forth in my co-pending application Serial No. 553,626, filed July 28, 1931. In this application, liner material is described comprising a sheet or strip of gutta percha composition having a film of resistant varnish, and the spot or ring liners may be stamped therefrom and applied to a cap in accordance with this invention.

60 In Figures 3 and 5, I have indicated at 10 the thin stratum or film of adhesive which is applied to the undersurface of the indented portion 6. As stated the adhesive may be applied by coating the exposed undersurface 6 or by applying a drop of liquid ad-

hesive which will be suitably spread over the area of the indented undersurface.

In Figures 6 and 7, I have shown the liners as provided with a suitable thin stratum in the form of a coating or film 11 of adhesive. 70

In either case, the adhesive will take the form of a proteid such as albumen or other adhesive, a gutta percha composition or a lacquer composition, the latter two of which will be fusible under a low heat and readily hardened, while the albumen or proteid adhesive will agglutinate, so that the liner is very securely and permanently affixed to the undersurface 6. It will be understood that the liner need not be united to the sealing ring and in many instances the ring will simply be loosely held within the groove and confined by the walls of the groove and the overlapping portion of the liner. 85

A further feature residing in the use of the present overlapping construction resides in having the liner bridge the space between the indented area and the sealing ring, so that any possibility of contaminating particles of dust or other matter collecting in such a space is entirely avoided. 90

For convenience, I have indicated the overlapping position of the liner and ring at 12 and, as heretofore stated, this overlying of the ring by the liner may be increased and decreased as desired or as requirements may best indicate. 95

The spot liner will be usually employed with relatively small necked containers as for example in connection with pressure beverages, while the ring liner will be useful in connection with larger jars and similar receptacles. 100

The liner itself very materially increases the sealing effect obtained and as already stated engages the sealing edge of the container and protects the contents thereof from contact with the ring. 105

In referring to a proteid adhesive herein, I may use a gelatin or similar animal glue, as well as one made up with casein. In the case of the gelatin glue, it is usually dissolved in water, together with glycerine or a glycerine substitute, and paraform or other formaldehyde containing ingredient is used for waterproofing. 110 115

Casein cannot be dissolved in plain water and there must be added, ammonia, borax, soda or some other alkali ingredient to the mass. The waterproofing agent such as formaldehyde combined with ammonia is added to the casein. 120

I prefer to use an albumen adhesive, whether from egg or blood which dissolved in water requires no waterproofing agent. 125

With respect to an adhesive lacquer, such as mentioned herein, I prefer to use one disclosed in the patent to Bragdon 1,639,395.

In referring to gutta percha or gutta 130

percha compounds, it will be understood that the gutta percha employed may be either the pure gutta percha or that combined with other gums or substances to refine or impart to the gutta percha desired properties for example, mineral fillers such as zinc oxide, magnesia, chalk, and talc may be added in substantially 25 to 35%, as well as balata and other resinous gums and resins which are frequently used for the purpose of producing a gutta percha compound. The same is true with respect to a balata composition or a chicle composition.

It will be understood that the gutta percha composition, as well as the adhesive lacquer composition, will be fusible under a low heat and will readily harden to secure a strong adherence of the liner with the cap. In this connection, it will be understood that the adhesive lacquer and the gutta percha respectively may be either applied to the liner itself or to the cap and that in applying the liner, either the plunger may be heated, or the cap itself heated to cause the gutta percha composition or the adhesive lacquer to assume a tacky nature.

As one example of a rubber ring which may be fitted in the groove in the cap, I employ a composition comprising 25 pounds crepe rubber, 7 pounds asbestos powder and 65 pounds talcum powder.

As one example of a rubber compound that may be flowed into the groove, I mention rubber 20 to 30%, water 20 to 25%, and mineral filler 25 to 50%.

Primarily, a liquid rubber of this sort is an intimate mixture of finely divided clay with rubber latex. All this contains a small percentage of ammonia and water soluble gum and may be colored with suitable pigments.

In applying the adhesive lacquer film, this may be placed directly over the metal surface of the cap or on the surface of the liner as the case may be. In some cases where the adhesive lacquer film is applied to the cap, it is desirable to first coat the tin or metal with a waterproofing process lacquer and after baking the latter at a temperature of substantially 300° F. or more to apply the lacquer adhesive which is subsequently baked at a temperature lower than 300° F.

I claim:

1. As an article of manufacture, a cap having a centrally indented portion and an internal groove surrounding the indented portion, a sealing ring in said groove, and a liner adhesively affixed to the undersurface of said indented portion and overlapping said ring, said ring and indented portion having their surfaces disposed in substantially the same plane whereby the areas of the liner overlying the ring and indented portion are disposed in substantially the same plane, said ring and liner being united along their over-

lapping portions and the liner being of less diameter than the sealing ring whereby to leave exposed the marginal portion of the sealing ring.

2. As an article of manufacture, a cap of the crown type comprising a metal shell having a corrugated depending skirt, a sealing ring within said skirt, a spot liner of less diameter than the sealing ring having a marginal portion partially overlying said ring and covering the metal shell within said ring, and a heat coagulated albuminous adhesive uniting said liner to the metal shell within the ring and to the ring, the marginal portion of the ring being exposed and the ring being freely positioned in the shell and retained therein by the overlapping adhesively united portion of the liner.

3. As an article of manufacture, a cap of the crown type comprising a metal shell having a corrugated depending skirt, a sealing ring within said skirt, a spot liner of paper having an exposed varnished surface and of less diameter than the sealing ring having a marginal portion partially overlying said ring and covering the metal shell within said ring, and a heat coagulated albuminous adhesive uniting said liner to the metal shell within the ring and to the ring, the marginal portion of the ring being exposed and the ring being freely positioned in the shell and retained therein by the overlapping adhesively united portion of the liner.

In testimony whereof I affix my signature.
CHARLES EDWARD McMANUS.