

June 4, 1935.

C. E. McMANUS

2,004,079

METHOD OF FORMING SEALED CONTAINERS

Filed May 14, 1930

Fig. 1.

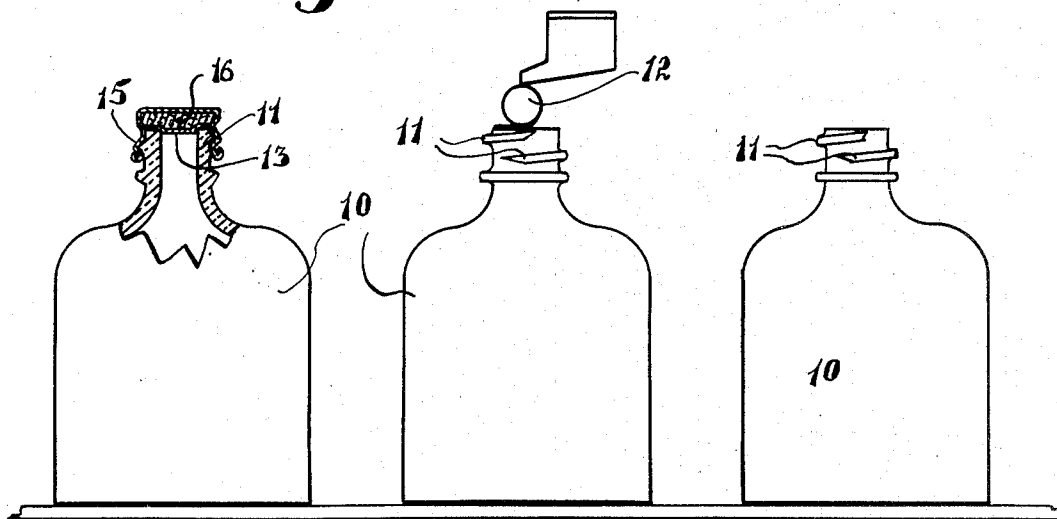
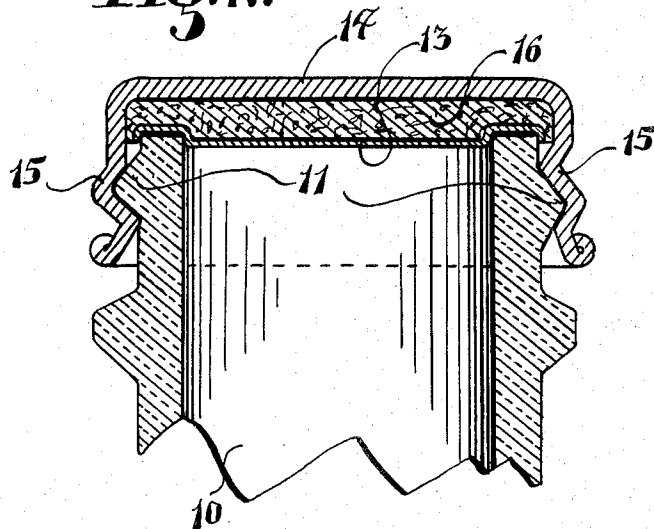


Fig. 2.



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2,004,079

METHOD OF FORMING SEALED
CONTAINERS

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Application May 14, 1930, Serial No. 452,159

1 Claim. (Cl. 226—80)

My invention relates to sealed containers and the method of forming same and more particularly to a sealed container in which its contents are confined by a sheet of material interposed between same and an outer sealing member having an interior cushion disc, the container and said outer member being provided with co-operating members for firmly holding the member in the operative relation to the container and to the intermediate protecting sheet, and in the novel manner of combining the various parts of the sealed container.

In the packing of various commodities, it has long been the practice to seal the container by means of a metallic cap adapted to be attached to the exterior of the mouth of the container and containing a resilient packing disc, gasket or washer, which by engagement with the neck of the container or bottle, forms a gas and liquid tight joint between the cap and the bottle or other container. This practice is followed with the type of closure known in the art as a crown cap, with threaded caps and with caps which are attached to the bottle or other container by having their skirts spun or clamped under the pouring lip of the bottles.

The contents of such bottles or other containers sometimes contain ingredients which will attack cork or rubber packing discs, gaskets or washers and it has been found necessary to overcome this difficulty, to produce closures in which the portion of the discs, washers or gaskets exposed to the contents of the bottle are protected by means of what is known as a center spot formed of a material which resists the action of the contents of the bottle thereon. Such center spots as they are called, are extensively used in crown bottle caps and also in other forms of caps when the pressure conditions are not such as to require the control of high pressures within the bottle. In the application of bottle caps to containers, the capping machine develops sufficiently high pressures to so distort the material of the cushion discs, washers or gaskets as to produce an effective seal about the center spot and even though very small areas of the material of the disc, gasket or washer may be exposed internally of the bottle, such has not been found objectionable. With other types of caps, however, the same pressure during application of the cap to the container is not developed or is not required. This is particularly true of caps having screw threaded skirts.

When packaging oily materials, however, it has been found that the center spot caps are not effective

since oils have penetrating qualities which will destroy the effectiveness of the seal when the slightest gap is presented between the center spot and the neck of the bottle or other container. Furthermore, by reason of these same properties in the oil, if a larger center spot be used so as to protect the material of the cushion, washer or gasket, minute crevices will be formed which will permit the escape of the oil. When packaging oils, it is necessary to take into account only the formation of an effective seal to exclude atmospheric air from a bottle and prevent the escape of the oil therefrom and to protect the cushion material of the cap from the oil. Pressures within the bottle need not be taken into account.

With the above in mind, I have provided a sealed container wherein the mouth of the container is hermetically sealed by a sheet of material which will not be attacked by the oil and which is secured in position by a cement which is also immune to deterioration by the action of the oil thereon and supplement this sealing by a cap structure provided with means co-operative with the neck of the bottle for securing the cap in position while developing sufficient cushioning action between the cap and about the edge of the sheet of material interposed between the cushion therein and the neck of the bottle to form an air or liquid-tight joint about the edge of said sheet.

The pressure of the cushioning material within the outer closure member will also serve to force the center portion of the interposed sheet within the neck of the bottle to a limited extent but sufficient to provide an effective seal within and about the stratum of cement securing the sheet to the bottle.

In the bottling of merchandise, it is essential that the closure of the container be economically effected both as to the materials employed and as to the speed of operation, since such containers are ordinarily used in connection with automatic container filling machines, and the application of the closure or seal must be at a speed determined by the capacity of such automatic machines.

In the method of forming the seal of my invention, I cement the sealing sheet to the container during the progress of the container through the automatic filling machine and utilize the outer cap to secure an effective joint, not only between the sealing sheet and the bottle, but about the edge of the sealing sheet.

The invention consists primarily in the herein described method of forming a sealed container

consisting in applying to the top of the container above the opening therein a cement immune to deterioration from the action of the contents of the container, setting a sheet of flexible material immune to deterioration from the action of the contents of the container upon the cemented portion of said container, applying an outer closure member to the container in engaging relation with said sheet and subjecting the edge of said sheet to pressure through said outer closure member; and in such other novel steps and practices and in a sealed container formed by said method, all as hereinafter set forth and described and more particularly pointed out in the claims hereto appended.

Referring to the drawing,

Fig. 1 is a view illustrating conventionally the method of the invention;

Fig. 2 is an enlarged cross sectional view showing the upper portion of a bottle sealed in accordance with the method illustrated in Fig. 1.

Like numerals refer to like parts in both of said views.

In the embodiment of the invention shown in the drawing 10 indicates a glass bottle, the neck of which is provided with exterior screw threads 11. The bottle 10 is to be filled with liquid to be packaged therein, by means of an ordinary filling machine not shown. Leaving the filling machine, the bottle passes under a cement applying device 12 by which a thin coating of cement is deposited upon the top of the bottle neck. The character of this cement may vary according to the contents of the bottle. When oil is to be packaged, I have found it desirable to use a cement having a base of casein which is not soluble in oil or is immune to deterioration by contact of oil therewith.

The next step in the method consists in applying to the top of the bottle, a disc 13 consisting of a sheet of flexible material which is also immune to deterioration from contact of the oil therewith. Preferably, I use a sheet of the cellophane type, a cellulose-acetate product possessing great toughness. This material is particularly desirable because it is practically transparent and is almost invisible when in position upon a bottle. Furthermore, although this material has a highly glazed surface, it may be firmly cemented in position. Immediately following, or simultaneously with the placing of the sheet 13 upon the neck of the bottle, I apply to the bottle, a cap 14 having a screw threaded skirt 15 co-operating with the screw threads 11 upon the neck of the bottle. Secured within this shell is a cushion disc, gasket or washer, 16.

This cap may be applied to the container by means of well known machinery which develops pressure sufficient to place the cushion disc, gasket or washer 16 under compression. The turning of the cap also has a tendency to turn the interposed sealing sheet 13 to an extent to secure an effective distribution of the cement about the top of the neck of the bottle. The pressure developed upon the cap has a like effect and also ensures that intimate relation between the two surfaces to be cemented necessary to the formation of a tight cement joint.

The tendency of the cushion disc, washer or gasket to expand, subjects the disc 13 to a continuing pressure so that it is merely required that the filled and sealed container be allowed to stand a sufficient time for the cement to set. No heat is necessary in the practice of

the method of my invention and no limitation is placed upon the speed of the existing machines employed for applying caps like the cap 14 to bottles.

The resiliency of the cushion disc, washer or gasket 16 forces the central portion of the sheet or disc 13 within the neck of the bottle with the portion thereof about the cemented area in intimate contact with the inner pouring lip of the bottle.

The resiliency of the cushion 16 in addition to securing the continuing pressure above referred to results in the portion of the disc or sheet 13, adjacent the edge thereof and in contacting relation with the top of the neck of the bottle, being brought into the desired intimate relation with the bottle throughout the entire area included in the portion which overlaps the bottle neck notwithstanding slight irregularities in the finish of the bottle top.

By sealing the bottle or other container in the manner above described, seepage of oil from the container is prevented by the inner seal consisting of the sheet 13 and the cement bonding same to the neck of the bottle. The presence of said sheet and said cement also protects the material of the cushion disc from the contents of the bottle. The cap 14 acts to protect the inner seal 13 and the cushion 16, so long as the closure 14 remains on the bottle and prevents the breaking of the inner seal within the line of cement.

The sealed container produced by the above method may be readily shipped and stored without likelihood of deterioration of the contents of the container and without the possibility of wastage due to the seepage of the contents through minute voids present in the sealing means or developed as a result of the action of the contents of the bottle upon such sealing means. Furthermore, with such containers, particularly when oil is packaged, there is no likelihood of the spoilage or defacement of articles surrounding a container, by the oil which escapes from the container.

It is not my intention to limit the invention to the particular type of metal shell or the cap shown in the drawing, it being obvious that other types of caps may be used in lieu thereof. It is merely required that the type of cap used be such that pressure is required to apply it to a container, which pressure shall suffice to ensure that relation between the inner sealing disc 13 and the top of the cap, necessary to secure an effective cement joint. The manner of applying the sheet or disc 13 to the neck of the bottle is also immaterial to the present invention, and it may be applied direct to the bottle before the application of a closure cap to the bottle, or it may be contained within this cap and be applied to the bottle simultaneously with the cap. The use of a cement which will set without the application of heat is essential to the method of the invention.

Having described the invention what I claim as new and desire to have protected by Letters Patent, is:—

The improved method of forming a sealed container for oil-like materials which consists in applying to the top of the container around the mouth thereof an adhesive adapted to set without the application of heat and immune to deterioration from the action of oil, positioning a disc of thin material of "cellophane" type arranged within a cap adapted to be applied by rotative movement on the adhesively coated top of the container, the cap having therein above the

disc a cushion liner engaging the said disc but freely separable from the disc, compressing the cushion liner on the said disc by rotating movement of the cap and utilizing the rotative movement of the cap to turn the "cellophane" disc to distribute the adhesive uniformly over the top of the container and the expansive action of the cushion liner to retain the disc in position, and permitting the adhesive to set and maintaining the separability of the disc and liner during the compression of the disc whereby to provide a disc sealed container which is substantially permanently sealed after removal of the cap until rupture of the disc. 5

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