Jan. 19, 1932. C. HAMMER 1,841,597

ROTARY VACUUM SEALING CAP

Filed Oct. 12, 1928

Fig. 1.

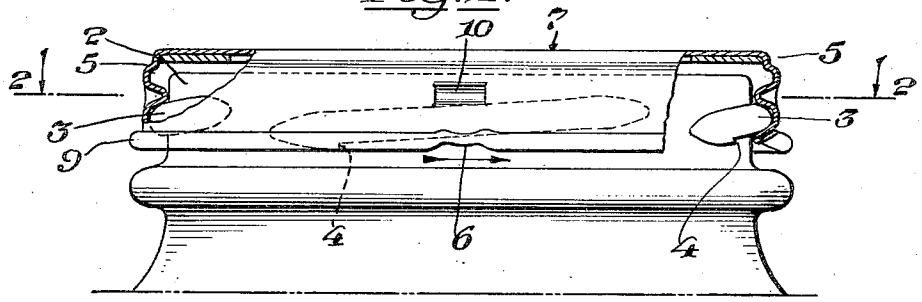


Fig. 2.

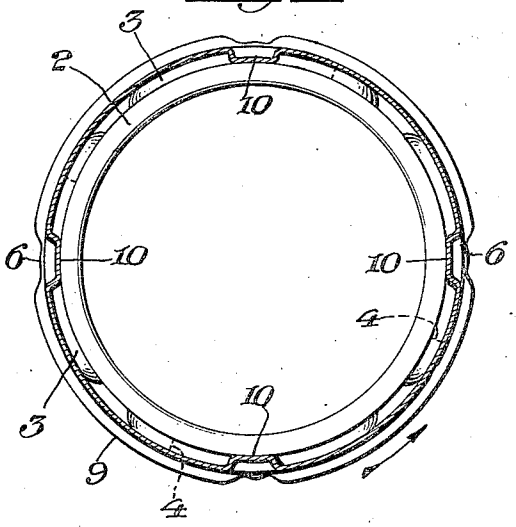


Fig. 3.

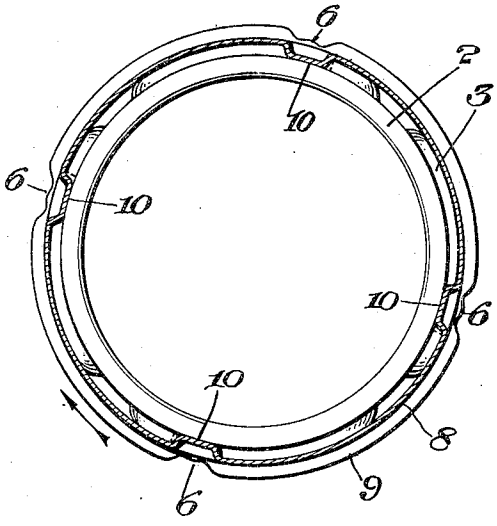


Fig. 4.

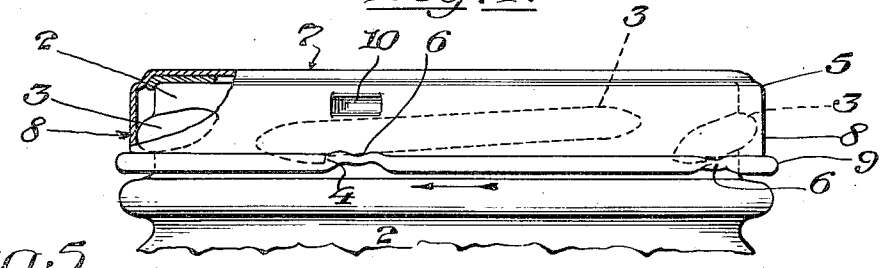
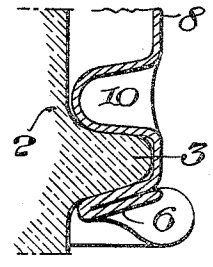


Fig. 5.



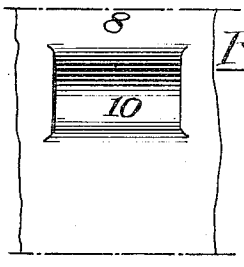
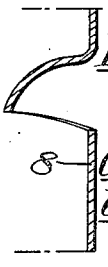


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE

CHARLES HAMMER, OF HOLLIS COURT BOULEVARD, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ANCHOR CAP & CLOSURE CORPORATION, OF LONG ISLAND CITY, NEW YORK, A CORPORATION OF NEW YORK

ROTARY VACUUM SEALING CAP

Application filed October 12, 1928. Serial No. 312,027.

This invention relates to vacuum-sealed containers having a rotary screw-on and off cap or closure for sealing the container, the object of the invention being to provide such a rotary cap with means so constructed and located that the cap will be lifted automatically and thus break the vacuum seal on the turning off of the cap.

In vacuum-sealed containers great difficulty is frequently experienced in releasing the cap to permit the use of the contents, for the vacuum-sealing of the cap so firmly holds the cap onto the container that it is often difficult for the user to break this vacuum without mutilating the cap or at times breaking the container, but once the vacuum is released the cap is easily removed.

The present improvement is adapted for use with various forms of containers, but is particularly adapted for use with a glass container.

An object of the present invention is to improve the sealing of a hermetically sealed package by using an inexpensive sealing cap provided with lugs and threads that engage easily and efficiently with the threads of a container.

Another object of the invention is to provide a sealing cap with lugs or threads and a jar with threads so constructed that the jar can be opened with ease by giving the cap a slight turn in a counter clockwise direction.

Another object of the invention is to provide a sealing cap with venting lugs so that the vacuum in the said hermetically sealed package is released upon turning the sealing cap slightly in a counter clockwise direction.

Another object of the invention is to provide an inexpensive sealing cap which will release with ease, thereby eliminating breakage of the containers.

Another object of the invention is to provide an inexpensive sealing cap for a hermetically sealed package that can be removed with ease without mutilating said cap, thereby rendering the cap adaptable to be used again on a container.

Other and further objects of the invention will be apparent from an understanding of the accompanying embodiment about to be described or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein

Figure 1 is a side view of the upper portion of a suitable container with this improved cap, shown partly in section, lifted from the container during the backward rotation of the cap;

Fig. 2 is a horizontal sectional view on line 2—2, Fig. 1;

Fig. 3 is a similar view to Fig. 2 showing the cap rotated into its locking position;

Fig. 4 is a side view of the cap applied to a container with the cap in its locking position;

Figs. 5 and 6 are enlarged detail views of one form of cap-releasing means; and

Fig. 7 is an enlarged view of a modified form thereof.

Similar characters of reference indicate corresponding parts in the several views.

Before explaining in detail the present improvement and mode of operation thereof, I desire to have it understood that the invention is not limited to the details of construction and arrangement of parts which are illustrated in the accompanying drawings, since the invention is capable of other embodiments, and that the phraseology which I employ is for the purpose of description and not of limitation.

The container of any suitable form and material may have any desired number of inclined projections or threads suitable for the purpose. In the present instance this container 2 is shown provided with four threads 3. These threads may be of any suitable form, but in the present instance they are shown provided with stops 4 for limiting the turning-on movement of the cap. The cap 5 when used with the number of threads shown, is likewise provided with four lugs or projections 6 to co-operate with the threads

of the container, and these projections or lugs may have the form shown in certain of my prior patents. The cap 5 is shown comprising a top 7 and a depending skirt 8 which may be provided with suitable knurls or corrugations having the advantages of stiffening the cap and also forming a roughened surface for facilitating the handling of the cap by the user. The skirt is also provided with a reinforced curled or beaded lower edge 9 having the locking projections 6 hereinbefore referred to. Located within the cap is a suitable sealing material, as a liner or an annular ring or gasket located in position to engage the top of the container and properly seal the same when the cap is applied and drawn down onto the container. In many instances this gasket or ring is in the form of a suitable composition, sometimes called "compo", and may be located in an annular recess in the top of the cap. The cap is also provided with one or more inwardly-extending projections 10 located above the locking lugs of the cap in position to engage the top of the threads of the container. These projections 10 are preferably located in alignment with the locking lugs or projections 6 of the cap, and the cap is shown provided with the same number of projections 10 as lugs so that, preferably, there is a projection 10 for each thread of the cap whereby the release of the cap is facilitated. These projections 10 are so located with relation to the threads of the container that they are slightly spaced from the tops of such threads. These projections 10 may be formed in any suitable way;—for instance, as shown in Figs. 5 and 6 in which the metal of the skirt is merely pushed inward, having connection with the skirt at the top and bottom of the projection; or as shown in Fig. 7 where the metal is pushed inwardly and the projections are free of the skirt at the lower side thereof. They are shown as of curved or arc-shaped form.

In use, after the container is supplied with its contents, the cap is applied in the usual way and turned onto the container, whereupon the locking projections 6 engage the under sides of the threads of the container and draw the cap downward, due to the inclination of the thread at the under side thereof, and thereby seal it, so that when the container is sealed by vacuum by some suitable form of processing—as by cooking the contents therein, or by supplying it with the contents in a hot condition, or withdrawing the air therefrom by suitable means—the cap becomes vacuum-sealed onto the container and, therefore, incapable of removal until such vacuum is released. In other words, the vacuum-seal is such that the cap cannot be lifted from the mouth of the container, although it may be rotated backward on the container. This backward rotation of the cap, by reason of the fact that the cap cannot be lifted from the mouth of the container, necessarily carries the locking lugs thereof in a straight path or in the same plane as they are in when in their final locking position at the inner ends of the threads. In other words, due to the vacuum-sealing of the container, these locking lugs 6 will not ride up the inclined under faces of the threads but will move in a straight path backward in the same position that they are in when the cap is finally locked. Consequently this backward movement of the cap brings the releasing projections 10 into position to engage the upper inclined surfaces of the thread, which thereupon forces or carries the cap upward automatically and so lifts or releases the cap from the top of the container, thereby releasing the vacuum and permitting the ready removal of the cap. The releasing lugs or projections 10 are so spaced or located above the top of the container threads that the application of the cap, in applying it to the container, will not cause any binding of the projections 10 on the threads,—this space being just sufficient to permit the cap to be applied without the projections 10 binding on the threads; but on the backward turning of the cap this space is closed up, as it were, by reason of the fact that as long as the cap is vacuum-sealed it cannot be lifted from the container, and consequently backward rotation of the cap will cause the projections 10 to engage the inclined top faces of the threads at the proper point intermediate the length thereof and thus automatically lift the cap from the top of the jar or container, thus breaking the vacuum-seal whereby, as stated, the cap can be readily removed.

Thus by this simple means the necessity of hitting the cap or mutilating it and sometimes breaking the container, to the injury of the contents, are entirely avoided.

It is to be understood that by describing in detail herein any particular form, structure or arrangement, it is not intended to limit the invention beyond the terms of the several claims or the requirements of the prior art.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit of the invention, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus explained the nature of my said invention and described a way of constructing and using the same, although without attempting to set forth all of the forms in which it may be made or all of the modes of its use, I claim:

1. A vacuum-sealed container having means for drawing the cap downward into sealing position to form a vacuum therewith and a rotary cap having a co-operating holding means, said cap also having means independent of said holding means for lifting the cap on the backward rotation thereof.

2. A vacuum-sealed container having a plurality of inclined projections or threads and a rotary cap having holding means co-operating therewith to form a vacuum seal, said cap also having means pressed inwardly from the skirt of the cap and independent of the holding means co-operating with means on the container for lifting the cap on the turning backward thereof thereby to release the vacuum.

3. A vacuum-sealed container having a plurality of inclined projections or threads and a rotary cap having holding means co-operating therewith, said cap also having means independent of the holding means co-operating with the threads of the container for lifting the cap on the turning backward thereof thereby to release the vacuum.

4. A vacuum-sealed container having a plurality of inclined projections or threads and a rotary cap having holding means co-operating with the under sides thereof and also having means co-operating with the upper sides of the same threads at substantially the same point for lifting the cap on the turning backward thereof thereby to release the vacuum.

5. A vacuum-sealed container having a plurality of inclined projections or threads and a rotary cap for sealing the container having lugs co-operating with the under sides thereof, said cap also having means pressed inwardly from the skirt of the cap co-operating with the upper inclined sides of the threads or projections for lifting the cap on the turning backward thereof thereby to release the vacuum.

6. A sealed container having a plurality of spaced means for drawing down the cap onto the container on the rotation of the cap for sealing the container in one direction and a rotary cap having holding means co-operating with said drawing-down means and also having independent means co-operating with said drawing-down means and spaced above the holding means for lifting the cap on the rotation thereof in the opposite direction.

7. A rotary cap for a sealed container provided with lugs or projections for drawing down and locking the cap onto the container on the forward rotation of the cap thereby to seal the same, said cap having means co-operating with said drawing-down means for automatically lifting the cap on the backward rotation thereof.

8. A rotary cap for a sealed container provided with means for drawing the cap down onto the container to seal the same, said cap having independent means for lifting the cap on the backward rotation thereof, said lifting means comprising an inwardly-extending projection or lug.

9. A rotary cap for a vacuum-sealed container provided with means for drawing the cap down onto the container to seal the same, said cap having means for lifting the cap on the backward rotation thereof thereby to break the vacuum, both of said means comprising inwardly-extending projections or lugs.

10. A rotary cap for a vacuum-sealed container provided with means for drawing the cap down onto the container to seal the same, said cap having means for lifting the cap on the backward rotation thereof thereby to break the vacuum, both of said means comprising inwardly-extending projections or lugs, one located at the lower edge of the cap and the other spaced there-above.

11. A rotary closure cap for a vacuum-sealed container having a projection or thread and having a top and a depending skirt provided with a beaded edge having inwardly-extending locking lugs carried thereby, said skirt also having means for automatically lifting the cap on the backward rotation thereof thereby to break the vacuum.

12. A rotary closure cap for a vacuum-sealed container having a projection or thread and having a top and a depending skirt provided with a beaded edge having inwardly-extending locking lugs carried thereby, said skirt also having means for automatically lifting the cap on the backward rotation thereof thereby to break the vacuum, said lifting means comprising an inwardly-extending lug.

13. A rotary closure cap for a vacuum-sealed container having a projection or thread and having a top and a depending skirt provided with a beaded edge having inwardly-extending locking lugs carried thereby, said skirt also having means for automatically lifting the cap on the backward rotation thereof thereby to break the vacuum, said lifting means comprising an inwardly-extending lug spaced above a locking lug.

14. A rotary closure cap for a vacuum-sealed container having a projection or thread and having a top and a depending skirt provided with a beaded edge having inwardly-extening locking lugs carried thereby, said skirt also having means for automatically lifting the cap on the backward rotation thereof thereby to break the vacuum, said lifting means comprising an inwardly-extending projection carried by the skirt and spaced from the top of the container thread or projection when the cap is sealed.

15. A rotary closure cap for a vacuum-sealed container having a thread and comprising a top and a depending skirt having an inwardly-extending locking lug for engaging the under side of the thread and also having an inwardly-extending projection spaced above the top of the container thread on the sealing of the cap and in position to engage the top of the thread on the back-

ward turning of the cap, thereby automatically to lift the cap and break the vacuum.

16. A rotary closure cap for a vacuum-sealed container having a thread and comprising a top and a depending skirt having an inwardly-extending locking lug for engaging the under side of the thread and also having an inwardly-extending projection spaced above the top of the container thread on the sealing of the cap and in position to engage the top of the thread on the backward turning of the cap, thereby automatically to lift the cap and break the vacuum, said lifting projection being in alignment with the locking lug of the cap.

17. A rotary closure cap for a vacuum-sealed container having a thread and comprising a top and a depending skirt having an inwardly-extending locking lug for engaging the under side of the thread and also having an inwardly-extending projection spaced above the top of the container thread on the sealing of the cap and in position to engage the top of the thread on the backward turning of the cap, thereby automatically to lift the cap and break the vacuum, said lifting projection being in alignment with the locking lug of the cap, said lifting projection having connecton with the skirt at the top and bottom thereof.

18. A rotary closure cap for a vacuum-sealed container having a thread and comprising a top and a depending skirt having an inwardly-extending lug for engaging the under side of the container thread on the application of the cap, thereby to lock the cap in position, an inwardly-extending releasing lug, the arc of which extends transversely to the arc of the locking lug and located in position free of the top of the container thread on the application of the cap but in position to engage the top of the thread on the turning backward of the cap before the lifting thereof from the container, whereby the cap is automatically lifted and the vacuum-seal broken.

19. A rotary closure cap for a vacuum-sealed container having one or more threads and comprising a top provided with a depending skirt provided with locking means corresponding in number to the number of threads of the container for engaging the under side of the thread with one or more vacuum-releasing means corresponding in number with the number of threads of the container, the latter being in position to engage the top of the same container threads on the turning backward of the cap, thereby to automatically release the cap and break the vacuum.

Signed at Brooklyn, county of Kings, N. Y., this 10th day of October, 1928.

CHARLES HAMMER.