W. P. WHITE.

SEALING CLOSURE FOR CONTAINERS.

APPLICATION FILED JULY 9, 1919.

1,345,722. Patented July 6, 1920.

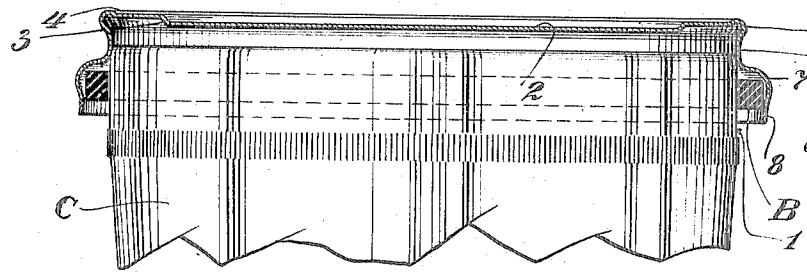


Fig. 1.

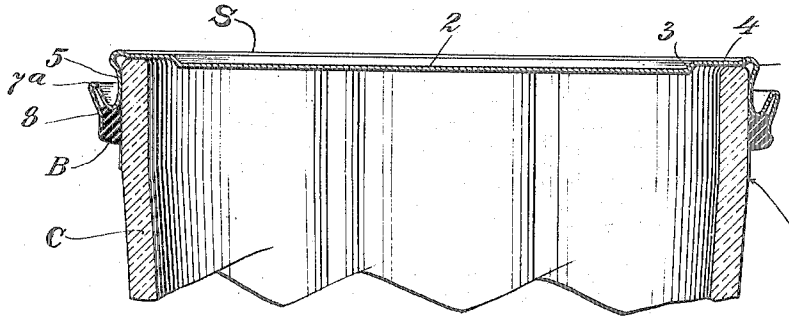


Fig. 2.

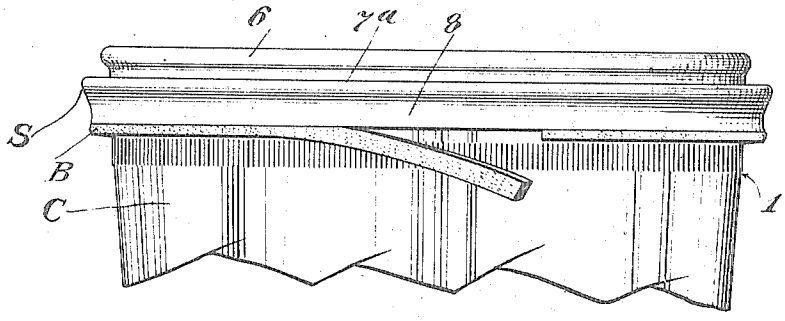


Fig. 3.

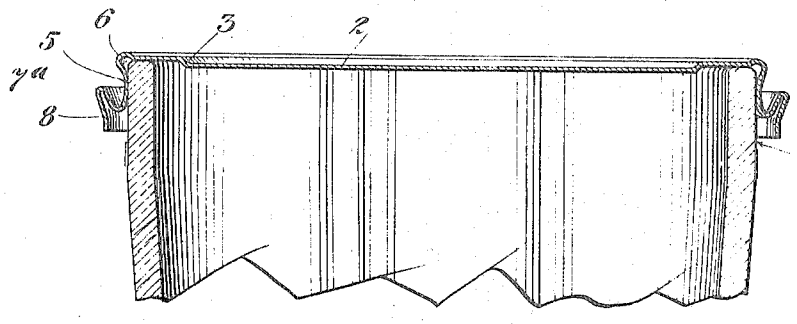


Fig. 4.

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SEALING-CLOSURE FOR CONTAINERS.

1,345,722. Specification of Letters Patent. Patented July 6, 1920.

Application filed July 9, 1919. Serial No. 309,572.

To all whom it may concern:

Be it known that I, WILLIAM P. WHITE, a citizen of the United States, residing at Brooklyn, in the county of Kings, State of New York, have invented certain new and useful Improvements in Sealing-Closures for Containers, of which the following is a specification.

This invention relates broadly to containers adapted for the packing or storage of food-stuffs and the like, and refers more specifically to a closure or cap by virtue of which a container such as a glass jar, tumbler or other vessel, may be hermetically sealed to preserve the contents.

In modern practice it is desirable to pack a variety of products in straight sided containers, such as tumblers. Many products so packed are of a nature such as to require hermetic sealing in the first instance, and yet are not completely consumed when the package is initially opened. For the protection and preservation of such products it is desirable that the closure used on the vessel be susceptible of reuse after the hermetic seal is broken so as to permit its being repeatedly replaced on and removed from the vessel as the contents of the package are gradually consumed.

A closure for sealing such packages, in order to be commercially practical, must also be adapted to accommodate the very considerable commercial variations in the size, shape and finish of the packing vessels on which they are intended to be used.

A purpose of this invention is to provide a closure which is suitable for use on straight sided vessels; which is adapted, in the original use, to form a hermetic seal upon the vessel; which is adapted to permit the sealed packages being opened easily, when desired; which is adapted for reuse, after the hermetic seal has been broken, as a frictionally retained closure for the vessel, effective to retain its place thereon to prevent spilling or rapid evaporation of the contents; and which is adapted to accommodate wide variations in shape and size of vessels upon which it may be used, both in its capacity as a hermetic closure and a friction closure.

Furthermore it is a purpose of my invention to provide a cap possessing the indicated characteristics, in which the shaping of the cap to provide the hermetic seal also forms part of the friction seal.

It is a further object of my invention to provide a cap possessing the indicated characteristics, in which the application of the friction seal and the hermetic seal may be accomplished by the same operation, if desired.

It is a further object of my invention to provide a cap possessing the desired characteristics, wherein the friction seal may be utilized to retain the cap in place on the vessel prior to and during the formation of the hermetic seal, so as to prevent spilling of the contents of the vessel during the handling thereof in the formation of the hermetic seal.

Other and further objects of my invention will be obvious and pointed out hereinafter, and in the claims, reference being had to the accompanying drawings forming a part of this application, in which is illustrated what I consider the preferred embodiment of the invention, but which I understand, and desire it to be understood, is not the only form contemplated by my invention as defined in the appended claims.

Described generally, my invention contemplates the provision of a closure cap of suitable flexible and ductile material, such as sheet metal, having proper stability to retain its form under the intended uses of such articles. This cap is shaped to provide the customary top portion which forms a closure for the vessel, and an annular skirt portion depending therefrom. The skirt portion is provided with a resilient expansible inner friction sealing portion which is adapted to be brought into engagement with the straight side wall of the vessel upon which the cap is seated in such fashion that the cap is held on the vessel by the frictional engagement or clasping action of this resilient portion. In association with this resilient sealing portion is formed a bead in which a gasket of compressible material is retained so that the gasket and the cap may be handled together in the original applica-

tion of the cap to the vessel. The cap with the carried gasket being placed on the vessel, the cap is subject to the action of proper pressing or spinning machinery which re-forms the metal in a portion of the skirt of the cap so as to compress the gasket against the side wall of the vessel about the entire circumference thereof, such re-formation of the cap also providing an annular restricting or tensioning bead which operates to hold the resilient friction sealing portion of the skirt under compression against the side of the vessel. The disposal of the gasket is such that it may be readily withdrawn from between the cap and the vessel, when desired, so as to break the hermetic seal and permit the removal of the cap. The cap, once having the hermetic seal broken, may be removed and replaced on the vessel at will, operating, when in place, to securely close the vessel and protect the contents thereof.

Considering the embodiment shown in the drawings more specifically it will be understood that Figure 1 represents a fragmentary elevational view of a glass tumbler with a form of my improved closure thereon, the said closure being shown in section, and being in the form as originally applied to the vessel previous to the formation of the hermetic seal;

Fig. 2 is a similar fragmentary sectional view of a tumbler and sectional view of the cap, showing the arrangement of the latter when the hermetic seal has been formed;

Fig. 3 is likewise a fragmentary elevational view of a tumbler and cap illustrating the manner in which the gasket may be removed to break the hermetic seal; and

Fig. 4 is a fragmentary sectional view of a tumbler with a cap in section, illustrating the manner in which the cap is seated on the vessel after the gasket of the hermetic seal has been removed.

Referring to the several parts illustrated, by means of the reference characters applied, it will be understood that C designates a suitable vessel, such as a glass tumbler; S designates a cap provided as a closure for the vessel; and B designates a ring of compressible material provided as a gasket to form the hermetic seal between the closure and the vessel.

As illustrated in Fig. 1, the cap, as originally formed includes a top portion for covering the mouth of the vessel, said top being formed with an annular bead 3 to provide a rim receiving portion 4. Depending from the periphery of the top portion is a skirt portion which is formed with an inwardly struck friction sealing bead 5. This sealing bead projects inwardly beyond the perimeter of the top portion so that the peripheral bead 6 is provided at the junction of the two. Below and continguously to the sealing bead 5 the skirt is formed convexly to provide a channel 7 for the retention of an annular gasket B of compressible material, said gasket retaining portion terminating at the lowermost portion of the skirt in the form of an annular terminal flange 8, which in the original form of the cap, is effective to retain the gasket against falling out of the gasket receiving channel.

When a cap of the form above described is placed upon the vessel upon which it is intended to be used the resilient sealing bead 5 will have frictional engagement with the side wall of the vessel, and operate to hold the cap in place upon it, while the size of the gasket channel 7 and the gasket B, is such as to permit the passage of the container within the gasket with some clearance between the two. The forms of the sealing bead 5 and the channel 7 and gasket B are all such as to permit their accommodating a great variation in shape and size of vessels. The vessel with the cap thus in position is presented to suitable forming mechanism, which is rendered effective upon the metal in the skirt portion below the sealing bead 5 to decrease the circumference of the gasket retaining channel, thereby pressing the gasket inwardly and compressing it tightly against the wall of the container. In placing the cap upon the container and in the re-forming of the skirt of the cap to compress the gasket, the over-hanging bead 5 functions effectively as a stop to prevent displacement of the gasket upwardly on the skirt portion. At the time of the formation of the hermetic seal, it is customary practice to exhaust the air from the container and seal the package *in vacuo*. In the re-forming of the skirt portion part of the metal in the gasket retaining channel is absorbed into a gathering ring by being folded upon itself to provide an annular constricting bead 7^a located adjacent the lower limit of the friction seal bead 5, and at the upper limit of the portion in which the compressed gasket is retained. Marginal flange 8 is moved inwardly and rendered effective upon the outer edge of the gasket material to compress it over substantially its entire width, and retain it against the wall of the vessel. The folded metal in the constricting bead 7^a provides a substantially non-expansible re-restricting device which operates under tension to retain the gasket tightly compressed against the wall of the vessel, thus filling up any irregularities between the cap and the vessel and providing a hermetic seal. The constricting member formed by the bead 7^a likewise imposes a restriction upon the expansibility of the friction sealing bead 5, holding the material in said bead under compression, so that the resiliency of the friction sealing bead is maintained. In this form the vessel is hermetically sealed and

the cap, under the combined effect of the atmospheric pressure and close frictional engagement of the gasket with the vessel, is very securely retained in place. The package is suitable for handling in shipment and will preserve its contents indefinitely, and the gasket is accessible from the exterior of the package to permit its removal without disabling the closure.

When it is desired to open the package, it is necessary to break the hermetic seal, and this is accomplished by forcing some pointed object into the gasket between the side of the vessel and the flange 8, thereby breaking the gasket and withdrawing one of the broken ends, and then the entire gasket. This permits the atmospheric air to relieve the partial vacuum within the container, and then the cap may be readily withdraw from the vessel. The cap thus removed is not punctured, distorted, or disabled in any particular, and is adapted for reuse as a closure for the vessel, either as a temporary removable closure, or as a hermetic closure. In the event the entire contents of the package are not used at once upon the breaking of the hermetic seal, it may be desirable to use the closure as a temporary cover, which it is specially adapted for as it may be replaced on the vessel and forced by hand into the position illustrated in Fig. 4, wherein the crown of the resilient sealing bead 5 engages the wall of the container and holds the cap securely in place, preventing spilling or rapid evaporation of the contents. The cap may be removed from and put back in this relationship as often as necessary or desired. In the event it is desired to refill the vessel and use the closure again to make a hermetic seal, the vessel having been refilled and the cap placed in position, where it is held by the friction seal, the vessel may then be inverted, and melted paraffin, sealing wax, or other plastic material run into the space between the cap and the side of the vessel. The sealing bead 5 prevents the contents from flowing out, and the seal material from working into the vessel when it is in this inverted position.

As is illustrated in Fig. 2, the re-formation of the skirt in effecting the original hermetic seal is so accomplished that the gasket material is not confined in the constricting bead 7^a; therefore, it may be readily withdrawn in the manner above explained. In the making of the second hermetic seal, as by the use of paraffin, a certain amount of the plastic material may flow into the bead 7^a and form an effective anchor for retaining the sealing material from falling out. The second hermetic seal may be broken by removing the sealing material with a pointed instrument, and the cap may be again used in the same manner.

I have mentioned above how, in the original sealing of the package the closure may be placed on the vessel and retained by the engagement of the friction sealing bead, prior to the formation of the hermetic seal. This is of advantage in the packaging of fluid materials, which might be spilled or splashed out of the vessel in the handling thereof prior to the formation of the hermetic seal. It is not necessary, however, that the friction seal be seated on the vessel as a preliminary operation of the formation of the hermetic seal, as the mechanism which may be employed to re-form the cap to provide the hermetic seal may also effect the seating of the friction sealing bead in engagement with the vessel.

Having thus described my invention, what I claim is:

1. As an article of manufacture, a closure cap for packing vessels comprising a top portion and an annular skirt portion of flexible material, said skirt portion being shaped to provide an inwardly effective resilient friction sealing bead and a gasket retaining portion contiguous to and below said bead.

2. As an article of manufacture a closure cap for packing vessels including a top portion and an annular skirt portion of flexible material, said skirt portion being shaped to form a gasket retaining part, an inwardly effective resilient friction sealing bead, and a circumferential restricting member effective upon the gasket retaining part and bead.

3. A closure cap for packing vessels comprising a top portion and an annular skirt portion, said skirt portion being shaped to form a gasket retaining part at the lower extremity of the skirt and a resilient friction sealing bead associated with the gasket retaining part.

4. A closure cap for packing vessels comprising a top portion and an annular skirt portion, said skirt portion being shaped to form a gasket retaining part for holding a gasket and an inwardly effective resilient friction sealing bead associated with the gasket retaining part and effective to limit upward movement of the gasket therein.

5. A closure cap for packing vessels comprising a top portion and an annular skirt portion; said skirt portion being shaped to provide a gasket retaining part adapted to retain a gasket in a position accessible from the exterior of the cap, an inwardly effective resilient friction sealing portion, and a circumferential constricting bead effective to exert compressive influence upon the sealing bead and the gasket retaining part.

6. In a combination with a container, a closure cap therefor comprising a top portion covering the mouth of the container and an annular skirt portion encompassing the wall thereof, said skirt portion being shaped to provide a resilient sealing portion having

frictional engagement with the side of the container and a gasket retaining part below the friction sealing portion, and a gasket compressed between the said gasket retaining part and the side of the container.

7. A package comprising the combination with a container of a closure cap having a top covering the mouth of the container and an annular skirt encompassing the wall thereof, said skirt being shaped to provide a gasket retaining portion and a resilient sealing portion having frictional engagement with the side of the container above the gasket retaining portion, and a gasket compressed between the said gasket retaining portion and the side of the container and accessible from the exterior of the package.

8. In combination with a container, a closure cap comprising a top covering the mouth of the container and an annular skirt encompassing the wall thereof, said skirt being shaped to provide a resilient sealing portion having frictional engagement with the side of the container and a gasket retaining portion below the friction sealing portion, and a gasket compressed between the said gasket retaining portion and the side of the vessel and removable with the cap in position on the container.

9. A package including the combination of a container and a closure cap having a portion forming a cover for the mouth of the container and a portion forming a skirt encompassing the wall of the container, the said skirt being shaped to provide a resilient sealing portion having frictional engagement with the side of the container and effective to retain the closure thereon, a gasket retaining portion effective to hold a gasket under compression against the side of the container to form a hermetic seal, and a gasket compressed against the side of the vessel and the friction sealing portion.

10. A package comprising a container and a cap having a top portion forming a closure for the container and a skirt encompassing the wall of the container, said skirt being shaped to provide a resilient portion having frictional engagement with the wall of the container to maintain the closure thereon, a gasket associated with the cap and the side wall of the container, and a portion of the skirt shaped to retain the gasket and resilient portion under compression against the side of the container.

11. A package comprising the combination of a container, a closure cap having a top covering the mouth of the container and an annular skirt encompassing the wall thereof, said skirt being shaped to provide a gasket retaining portion and a resilient sealing portion having frictional engagement with the side of the container, and a gasket compressed between the said gasket retaining portion and the side of the container and accessible from the exterior of the package.

12. A package comprising the combination of a container, a closure cap having a top covering the mouth of the container and an annular skirt encompassing the wall thereof, said skirt being shaped to provide a gasket retaining portion and a resilient sealing portion having frictional engagement with the side of the container, and a gasket compressed between the said retaining portion and the side of the container and removable from the exterior of the package.

13. In combination with a container, a closure cap comprising a top covering the mouth of the container and an annular skirt encompassing the wall thereof, said skirt being shaped to provide a resilient sealing portion having frictional engagement with the side of the container, a gasket retaining portion, and a gasket compressed between the said gasket retaining portion and the side of the vessel and removable with the cap in position on the container.

14. A package including the combination of a container and a closure cap having a portion forming a cover for the mouth of the container and a portion forming a skirt encompassing the wall of the container, the said skirt being shaped to provide a resilient sealing portion having frictional engagement with the side of the container and effective to retain the closure thereon, and a gasket retaining portion effective to hold a gasket against the side of the container to form a hermetic seal; said gasket retaining portion being accessible from the exterior of the package.

15. In combination with a container, a closure cap therefor comprising a top portion covering the mouth of the container and an annular skirt portion encompassing the wall thereof, said skirt portion being shaped to provide a resilient sealing portion having frictional engagement with the side of the container to form a continuous sealing zone circumferentially thereof, a gasket retaining part below the friction sealing portion, and a gasket compressed between the said gasket retaining part and the side of the container.

16. A closure cap for packing vessels comprising a top portion and an annular skirt portion, said skirt portion being shaped to form a gasket retaining part for holding a gasket and an inwardly effective resilient friction sealing part associated with the gasket retaining part and effective to limit upward movement of the gasket therein.

17. As an article of manufacture, a closure cap for packing vessels including a top portion and an annular skirt portion of

flexible material, said skirt portion being shaped to form a gasket retaining part, an inwardly effective friction sealing part and a circumferential restricting member effective upon the gasket retaining part and friction sealing part.

18. As an article of manufacture a closure cap for packing vessels including a top portion and an annular skirt portion of flexible material, said skirt portion being shaped to form a gasket retaining part, an inwardly effective friction sealing part, and a gathering ring effective upon the gasket retaining part and friction sealing part.

WILLIAM P. WHITE.