June 13, 1933. A. G. OSBORNE 1,913,816

CAP REMOVING TOOL

Filed Jan. 27, 1931

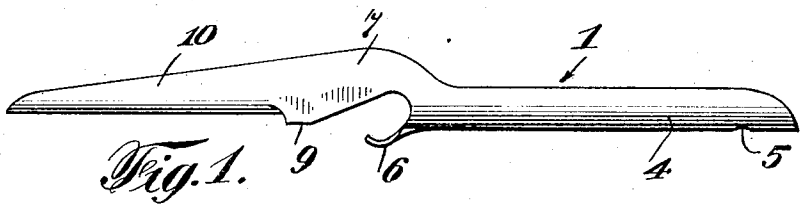


Fig. 1.

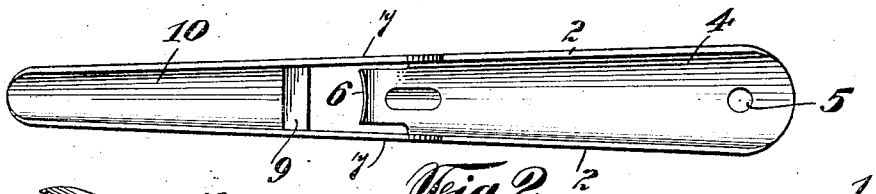


Fig. 2.

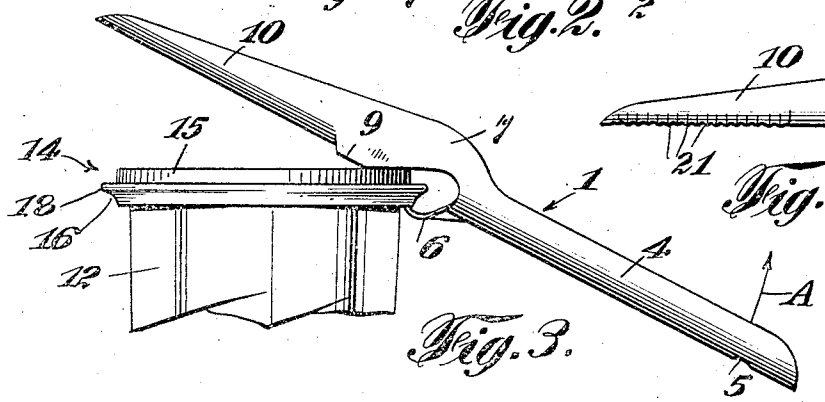


Fig. 3.

Fig. 4.

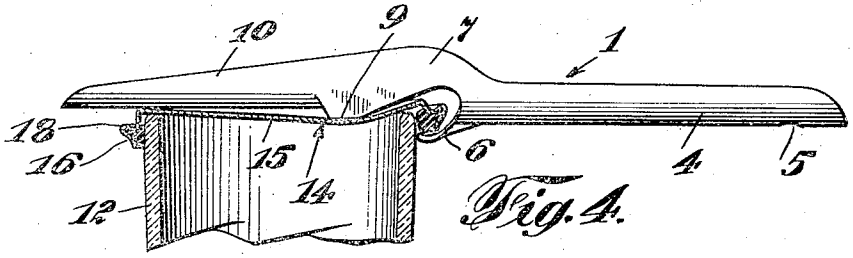
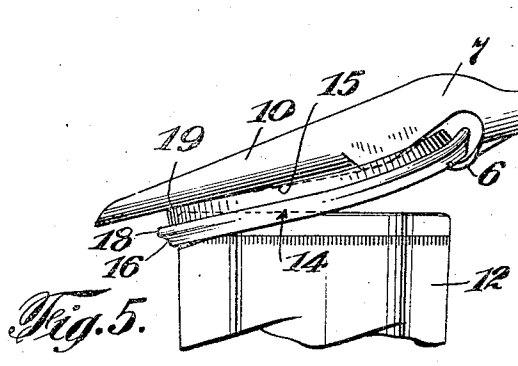


Fig. 5.



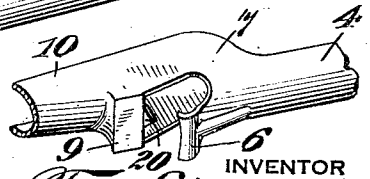


Fig. 6.

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UNITED STATES PATENT OFFICE

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CAP REMOVING TOOL

Application filed January 27, 1931. Serial No. 511,519.

The present invention relates to an improved cap lifter particularly designed for removing closure caps from bottles, jars, tumblers and the like.

The present invention is primarily adapted for removing friction closures from wide mounted containers, but is also equally applicable for removing closures from narrow mouth ware such as soda pop bottles and the like.

In removing caps from containers, it is necessary to engage effectively the lower edge of the closure with the jaw of the cap opener, to avoid disengagement during the opening operation. It is equally important, in most cases, that the closure be removed without substantial deformation thereof so that it may be used again to reseal or cover the container in order to protect the unused part of the contents thereof during consumption. Certain commodities, for example lubricating oils, may be sold in sealed packages and the contents dispensed therefrom by the dealer. If the cap is not destroyed, dishonest dealers might impose upon the manufacturer, and upon the public, by refilling the container with an inferior product and resealing it with the original cap; in which case, the dealer could sell the refilled package as an original package. On the other hand, if the package is sold to the ultimate consumer, the removed cap should be usable as a cover during the consumption of the product. In certain cases also, it is desirable to puncture the cap to release the vacuum within the container and thereby facilitate removal of the cap. The prior art fails to provide an opener adapted to accomplish effectively the above objects.

The present invention aims to provide a cap removing device adapted to achieve the above advantages and minimize the inherent difficulties of the prior art structures by providing suitable means for engaging the skirt of the cap and a pair of fulcrum members adapted to co-operate with the engaging means to remove the cap without substantial deformation thereof. If desired, means for breaking the vacuum in the package before the cap is removed may be provided without rendering the cap unfit for use as a cover.

An object of the invention is to provide an inexpensive opener adapted to effectively remove a cap from a container.

Another object of the invention is to provide a cap removing device adapted to remove a cap without material deformation thereof so that it may be used to reseal the container.

Another object of the invention is to provide a cap lifter having a plurality of fulcrums.

Another object of the invention is to provide a container opener having a fulcrum adapted to be effective during the engagement of the jaw of the opener with the lower edge of the cap, and another fulcrum adapted to be effective during the removal of the cap.

Another object of the invention is to provide a cap lifter having the above advantages and adapted to facilitate the opening of a vacuum sealed container by automatically breaking the vacuum prior to the removal of the cap therefrom.

A further object of the invention is to provide a bottle opener having the above advantages adapted to puncture the cap to prevent reuse of the cap to imitate or misrepresent the original package.

Other and further objects of the invention will be obvious upon an understanding of the illustrative 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 accom-

panying drawing, forming a part of the specification, wherein

Fig. 1 is a side elevational view illustrating a preferred embodiment of the present invention;

Fig. 2 is a top plan view of the preferred embodiment;

Fig. 3 is a side elevational view illustrating the cap remover being applied to a cap sealed upon a container;

Fig. 4 is a side elevational view illustrating the relation of the cap and opener at the time the second fulcrum becomes effective;

Fig. 5 is a side elevational view showing the relation of the cap and container opener at the completion of the removal operation;

Fig. 6 is a fragmentary perspective view showing a modified construction of the cap lifter provided with means for breaking the vacuum in a sealed container; and

Fig. 7 is a fragmentary side elevational view illustrating a modified construction of the forward end of the opener.

Referring again to the drawing, there is shown a container opener 1, preferably comprising a channel member stamped from sheet metal, having upwardly extending side flanges 2 adapted to strengthen the construction and to minimize the weight of the metal necessary. A handle 4 is provided at one end of the opener and has an aperture 5 therein to permit the opener to be suspended from a hook or nail, when not in use. The handle may be of any desired shape, but is here shown rounded for convenience in manufacture and in manipulation. A suitable cap engaging jaw 6 is spaced forwardly of the handle portion and extends downwardly below the handle to provide means for effectively engaging the lower edge of the skirt of a closure cap. The jaw has substantial width at its end and is preferably curved slightly to provide proper engagement with the skirt of the cap and to prevent the metal of the cap from material deformation under the pressure applied by the jaw. A pair of arched extensions 7, integral with the handle, provide a support for the fulcrum member 9 adapted to co-operate with the cap engaging jaw 6. Preferably, the jaw 6 extends substantially below the fulcrum member 9 so that it will engage the skirt of the cap while the fulcrum rests upon the top thereof, without requiring the handle to be inclined too much to the horizontal.

In removing friction type closures, such as shown in the Edgar Scofield patent, No. 1,611,955, dated December 28, 1926, applied to tumblers or other wide mouthed receptacles, difficulties are encountered with present openers and the caps are generally distorted during the opening operation to such an extent that they are unfit for use as covers. The tendency in removing the cap is to apply the tool in a single position to pull the cap off. Ordinarily, the cap is not pulled off but the engaged portion is bent over the edge of the container, thereby distorting and, in many cases, demolishing the cap. The operation has to be repeated one or more times, further distorting the cap.

To avoid these disadvantages and to minimize transverse bending and unnecessary distortion of the cap while being removed, an extension 10 is provided at the forward end of the opener illustrated herein, which merges into the fulcrum member 9 and the arched extensions 7. The extension 10 may be of any desired length but, preferably, extends entirely across the top of the cap and may extend beyond the opposite side. As illustrated in the drawing of the preferred embodiment, the under surface of the extension is at a substantially higher level than the fulcrum 9. In this manner, the jaw 6 and the fulcrum 9 co-operate, during the removal of the cap, to raise the edge of the cap sufficiently to afford a secure engagement of the jaw prior to the engagement of the extension 10 with the other side of the cap. When the extension 10 engages the opposite side of the cap, directly above the rim of the container, the cap is raised about the second fulcrum, shown more particularly in Figs. 3 and 4, without further deformation of the cap. By regulating the amount that the fulcrum 9 extends below the lower surface of the extension 10, the amount of deformation of the cap may be regulated to any desired extent. A certain amount of deformation is desirable in order to assure a secure grip of the jaw with the lower edge of the cap. In the preferred embodiment, the fulcrum 9 extends downwardly so that the cover part of the container is pressed slightly into the mouth of the container.

The operation of the opener is shown more particularly in Figs. 3, 4, and 5. For purposes of illustration, a package is shown substantially similar to that illustrated in the Scofield patent, No. 1,611,955. The package may comprise a container 12, a closure cap 14 having a cover portion 15, and a depending skirt 16 with a bead 18 formed therein adapted to receive the usual sealing gasket. The bead is reformed during the sealing operation to force the gasket securely against the container. In the removal of the cap, the opener is applied, as shown in Fig. 3, with the jaw 6 beneath the lower edge of the skirt, and the inner side of the fulcrum 9 on the cover portion of the cap adjacent the rim of the container. The lower edge of the arched member 7 may or may not contact with the cap, depending upon its shape. The cap remover is inclined slightly to the horizontal, as illustrated, when engaging the cap. Upon the handle 4 being moved upwardly, as indicated by the arrow A, the engaged portion of the cap is bent upwardly, by

reason of the pressure applied by the jaw 6, and the cover part of the cap is bent downwardly by the fulcrum 9. This causes the jaw to be drawn inwardly to afford a secure grip on the under side of the skirt. If desirable, the opener may be applied at several points about the periphery of the cap, raising the side of the cap slightly in each instance, or the cap may be removed by a single operation of the opener.

As illustrated more particularly in Figs. 4 and 5, when the handle 4 has been raised substantially to its horizontal position, the extension 10 engages the opposite side of the cap at 19 to prevent the fulcrum 9 from being pressed further downward. The fulcrum 10 limits the amount of bending that is possible with the cap lifter. Subsequent raising of the opener, as illustrated in Fig. 5, causes the cap to be lifted about its opposite side so that the entire cap is raised from the container. The extension 10 co-operates with the fulcrum 9 to limit the amount of bending and to prevent substantial distortion of the cap. The amount of bending can be regulated in the manufacture of the opener by changing the relative positions of the fulcrum 9 and extension 10. The further downward the fulcrum 9 extends, the greater the distortion. A certain amount of distortion is desirable in order to stretch the skirt so that the cap may be used as a reseal. If the cap were raised directly upward, for example, by air pressure in the interior of the container, the skirt would not be expanded sufficiently so that it could be reapplied to the container manually as a reseal during the consumption of the contents. For certain products, a cap adapted to make a reseal is very desirable.

As pointed out hereinbefore, with some products it is desirable to render the cap incapable of reuse, in order to prevent the package from being refilled and sold as an original package. In other words, the customer and the manufacturer, in some cases, desire to guard against contamination of the contents or substitution thereof. In Fig. 6, a slightly modified construction is illustrated, wherein the flat fulcrum member 9 is provided with a sharp indentation or projection 20, which is adapted to puncture the top of the cap when the opener is applied thereto, giving visible indication of the fact that the cap has been used. In addition, if the package is vacuum sealed, the puncture breaks the vacuum and facilitates removal of the cap. It will be appreciated that, where there is a vacuum in the container, the resistance to removal of the cap is increased very substantially, due to the pressure of the external atmosphere. The opener shown in Fig. 6 relieves this external pressure and, at the same time, does not mar the cap to such an extent as to interfere with its subsequent use as a cover.

If desired, the under side 11 of the extension 10, which engages the side of the cap in the removal operation, may be knurled or corrugated, as shown at 21 in Fig. 6. These corrugations tend to prevent the cap lifter from slipping on the opposite side of the cap.

It will be seen that the present invention provides an inexpensive cap removing device which may be constructed from a single piece of metal by simple stamping operations. The opener engages the cap effectively and prevents unnecessary distortion of the cap during the removal operation. The relative position of the two fulcrums is adapted to control the amount of distortion in order to effect a secure grip on the under side of the skirt of the cap. If desired, the opener may be constructed automatically to vent vacuum sealed containers and thereby facilitate the removal thereof. The cap remover illustrated herein is rugged in construction and fully capable of withstanding the rough usage to which it may be subjected.

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

Having thus described my invention, I claim:

1. A cap lifter comprising a sheet metal channel member, a cap engaging jaw integral with the channel member and extending downwardly from the bottom of the channel, the part of the channel member on one side of said jaw being adapted to serve as a handle, the part of the channel member on the other side of said jaw being substantially an extension of the handle and of substantially the same length to engage the side of the cap opposite to the portion engaged by the jaw.

2. A cap lifter comprising a handle portion, a cap engaging jaw, an instruck portion spaced forwardly of said jaw adapted to rest on top of the cap to form a fulcrum, and an arm integral with said handle adapted to engage the cap and provide a second fulcrum at the opposite side of the cap, whereby said jaw and fulcrum members will co-operate to remove the cap.

3. A device of the class described comprising a member formed of sheet metal, one end of said member extending transversely across the top of a cap when said device is applied, a cap engaging jaw at the middle portion of said member, a depending portion forwardly of said jaw, and means formed in said depending portion adapted to puncture the top of the cap to release the vacuum within the container.

4. A device of the class described comprising a handle, a cap engaging jaw, a fulcrum

portion arched forwardly of said jaw, projecting means on said portion for puncturing the top of a cap to break the vacuum within a container, and an arm integral with said handle extending forwardly thereof to provide a second fulcrum portion, said fulcrums and jaw co-operating to remove the cap from the container.

5. A cap lifter comprising a member formed of sheet metal, a cap engaging jaw and a depending fulcrum at the middle of said member for engaging one side of a cap, the forward end of said member extending across the cap to abut against the opposite side thereof, and corrugations at the abutting portion.

6. In a cap lifter, the combination of a fulcrum portion at one end thereof, a cap engaging jaw, and a second fulcrum portion at a lower level than said first portion, said fulcrums and jaw being adapted to co-operate to remove the cap.

7. As an article of manufacture, a cap lifter comprising the combination of a handle, a cap engaging jaw, a fulcrum adapted to engage the cover part of a cap adjacent said jaw to facilitate engagement of the jaw with the cap, and a second fulcrum spaced forwardly of said first fulcrum adapted to be effective when the handle has been raised a predetermined distance in removing the cap.

8. As an article of manufacture, a cap removing device comprising the combination of a handle, a cap engaging jaw, a fulcrum adjacent said jaw adapted to be effective during the engagement of the jaw with the cap, and a second fulcrum adapted to render said first fulcrum substantially ineffective after the jaw has firmly engaged the cap.

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