The present invention relates to the sealing art and more particularly to a sealed package provided with a closure cap which may be readily sealed and removed and may thereafter be used for resealing the package.

Closure caps having a compressible gasket in the skirt adapted to be telescoped over the mouth or sealing surface of a container by downward pressure on the cap are popular because they can be sealed by simple inexpensive capping devices and can be easily removed. One of the difficulties with these caps is that they do not accommodate containers having a substantial range of variation from a true standard in both size and circularity. In many instances defectively sealed packages result, which is objectionable particularly if a hermetic or vacuum seal is required to preserve the product. To guard against this contingency, packers use closures which are sealed with greater difficulty and which do not attain the advantages of simple press-on closures.

The present invention aims to overcome these difficulties by providing an improved cap having a gasket in the skirt adapted to be pressed over and sealed securely to a container by a simple inexpensive capping device, and further aims to insure a secure seal in every instance by providing a cap having a plurality of zones for exerting concentrated sealing pressure on the gasket to form a multiple seal on the container.

An object of the invention is to provide an inexpensive sealed package wherein the cap may be securely sealed by simple capping machinery.

Another object of the invention is to provide a closure cap adapted to be pressed on a container by downward pressure.

Another object of the invention is to provide a closure cap which is readily removed from the container and which may be used to resal the container during the consumption of the contents.

Another object of the invention is to provide a press-on closure cap which exerts concentrated sealing pressure on a gasket at a plurality of zones to form a secure hermetic or vacuum seal.

Another object of the invention is to provide a closure cap having a gasket therein and a pair of ribs in the skirt thereof adapted to cooperate with a bead on a container to seal the cap securely on the container.

Another object of the invention is to provide a closure cap having a gasket therein and a pair of ribs in the skirt of the cap adapted to seal the gasket on the side wall of a container, one of the ribs extending further radially inwardly than the other to exert substantially greater sealing pressure.

Another object of the invention is to provide a press-on closure cap having a wire edge in the skirt adapted to strengthen the skirt to prevent distortion of the cap and to provide a purchase grip for a cap removing tool.

A further object of the invention is to provide a press-on closure cap having the lower edge of the skirt rolled into a wire edge or bead to conceal the raw edge and having the bead set inwardly to form a support for a gasket.

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 claim, 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 drawing, forming a part of the specification, wherein:

Fig. 1 is a fragmentary side elevational view, partly in section, illustrating a preferred embodiment of the present invention;

Fig. 2 is an enlarged fragmentary sectional view illustrating the cap shown in Fig. 1 before it is applied to a container;

Fig. 3 is an enlarged fragmentary sectional view illustrating the cap sealed on a container;

Fig. 4 is an enlarged fragmentary sectional view illustrating another embodiment of the invention;

Fig. 5 is an enlarged fragmentary sectional view illustrating still another embodiment of the invention;

Fig. 6 is an enlarged fragmentary sectional view illustrating a modified form of ledge for supporting the sealing gasket.

Referring again to the drawing and more particularly to Figs. 1, 2, and 3 thereof, there is shown a sealed package comprising a container 1, and a closure cap 2. The container here shown is in the form of a tumbler although the invention is equally applicable to jars and other types of receptacles. The upper end of the container is provided with a rim 4 having slightly rounded edges adapted to facilitate pressing the cap therover and a sealing zone 5, which preferably is substantially cylindrical and has a bead or rib 72 therein. If desired, the container may be provided with a pry-off ledge 6 at a point slightly below the sealing zone to permit a tool to be inserted below the lower edge of the cap for prying off when desired.
the cap upwardly from the container. The ledge of the cap may be annular or continuous or may be in the form of a lug extending about the periphery of the container for a relatively short distance.

The closure cap comprises a cover portion and a telescoping skirt portion having a sealing zone at its upper end. The zone is provided with a pair of radially inwardly extending ribs or beads adapted to press a gasket carried in the skirt of the cap against the sealing zone of the container. Preferably, the ribs are narrow so that concentrated sealing pressure is exerted against the side wall of the container. Preferably, two ribs are provided although a greater or lesser number of ribs may be utilized if desired. In this manner, the gasket is sealed against the container very securely, preferably at two zones thereby preventing defective sealing of packages. Also, by utilizing a plurality of sealing ribs the caps are fully capable of effectively sealing containers which are slightly out-of-round, which vary slightly beyond the permissible range of size tolerances, or which have imperfections in the finish or sealing zone. Another feature of the cap is that the upper rib may be formed very close to the cover portion of the cap to prevent the contents of the container from getting back of the gasket. In some cases, it may be feasible to increase the flexibility of the skirt by providing a pair of annularly arranged interrupted ribs instead of continuous ribs as illustrated herein, but such interruption should not be of sufficient size to impair the seal.

The lower part of the skirt is flared downwardly and outwardly at to hold the gasket in upwardly and inwardly flared position to facilitate telescoping it over the mouth of the container by downward pressure on the cap. This flared portion extends from the lower rib or bead downwardly to a wire edge formed at the bottom of the skirt. The wire edge preferably is formed by rolling the free edge of the skirt outwardly and thereat or simultaneously setting it radially inwardly to provide a shelf or ledge at the inside of the cap for supporting the gasket. The wire edge makes the cap more rigid and easier to handle and remove without mutilation, and provides a good purchase grip for a cap removing tool. Also, the wire edge conceals the raw edge of the skirt and prevents corrosion thereof.

The outwardly extending rib or bead at the sealing zone is positioned so that the upper and lower ribs of the cap exert concentrated sealing pressure above and below it, respectively (Fig. 5). The rib locks the cap securely on the container against accidental removal and is particularly advantageous when it is desired to process or sterilize the contents of the package. The interlocking seal provided by the ribs and rib securely holds the cap in sealed position to resist pressures within the container during the sealing operation or when the package is sterilized.

In Fig. 4 a modification of the invention is shown wherein the cap is provided with an upper rib and a lower rib. The upper rib is rolled substantially deeper and extends further radially inwardly than the lower rib to exert greater sealing pressure substantially at the top of the sealing zone. In this manner the cap is sealed securely at the upper part of the sealing zone and any tendency of the cap to pop off or loosen is minimized. Also, when the cap is telescoped or pressed over the mouth of the container the gasket is held in tapered position and sealing pressure on the gasket is gradually increased as the cap is moved to its final position. The shallow lower sealing rib facilitates the passage of the end of the container past the upper rib which has a smaller inner circumference.

In Fig. 5 another way of attaining the above advantages is illustrated wherein the skirt of the cap is tapered or flared upwardly and inwardly from the wire edge to the cover part so that the upper rib extends further inwardly than the lower rib. The upper rib by reason of its smaller diameter will be more rigid and will provide a tighter seal at the upper end of the sealing zone. If desired, the lower rib may be rolled deeper or further inwardly with respect to the skirt than the upper rib so that the innermost portions of the upper and lower ribs are in the interior of the skirt and are substantially in vertical alignment. Also, if desired, the lower rib may be slightly wider to make it more flexible whereby the gripping action of the cap is gradually increased as it is pressed on the container.

In Fig. 6 a cap is shown having the lower edge of the skirt flanged inwardly to provide a substantially flat or horizontal shelf for supporting the gasket. Suitable ribs are provided in the upper part of the skirt for exerting concentrated sealing pressure against the gasket as described above.

It will be seen that the present invention provides an improved cap adapted to be pressed over the mouth of the container by simple inexpensive machinery to form an effectively sealed package. The lower flared portion of the skirt facilitates application of the cap and the wire edge provided at the bottom increases the strength of the cap to prevent mutilation thereof. The wire edge also provides a good purchase grip for a cap removing tool to facilitate removal. The ribs in the upper part of the skirt press the gasket securely against the container to provide a plurality of zones at which concentrated sealing pressure is exerted. The package can be readily opened by the usual cap removing tool or by inserting a coin or tool between the bottom of the cap and the pry-lever to pry the cap from the container. Further, the resulting package is rugged in construction and fully capable of withstanding rough usage to which it may be subjected.

As various changes may be made in the form, construction and arrangement 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:

A sealed package comprising in combination, a container having a sealing surface provided with an outwardly extending bead, a cap, a gasket in said cap, an inwardly extending rib in the skirt of said cap adapted to press said gasket against the sealing surface of said bead, and a second rib in the skirt of said cap adapted to press said gasket against the sealing zone below said bead.

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