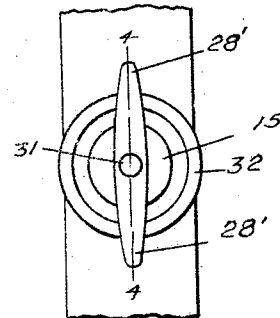
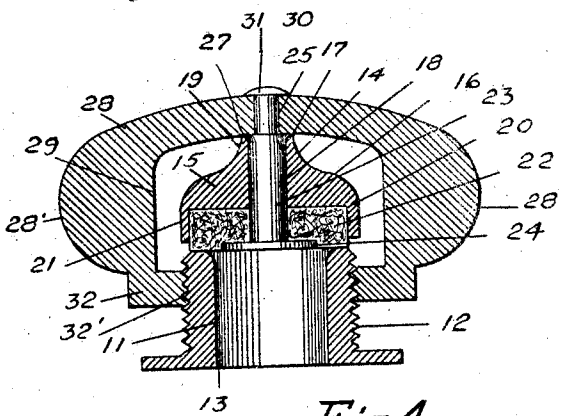
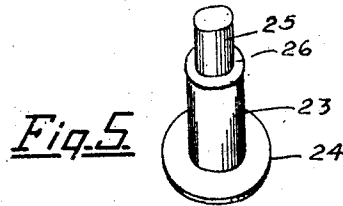
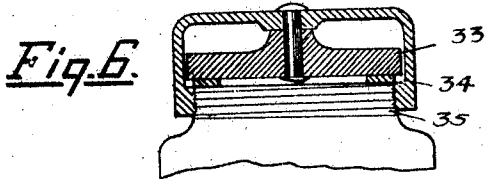
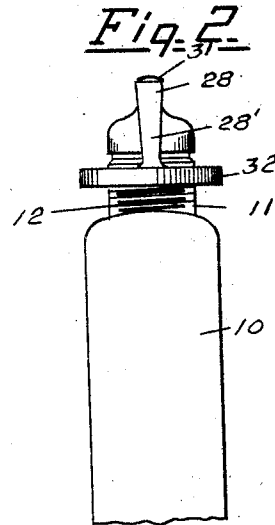
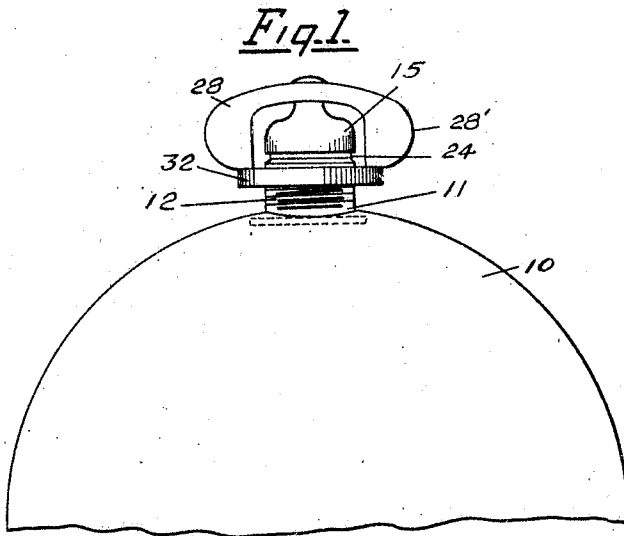


C. A. BUNKER.
STOPPER FOR CONTAINERS.
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STOPPER FOR CONTAINERS.

1,378,995.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES A. BUNKER, a citizen of the United States of America, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Stoppers for Containers; and I do hereby declare that the following is a full, clear, and exact description of the invention, reference being had to the accompanying drawing, forming a part of this specification.

The invention has for its object:

First, means for sealing and unsealing the apertures to bottles or containers without injury to the neck.

Second, to effect the sealing of the entire area of an aperture in one sealing movement and thus prevent leakage.

Third, to avoid friction of the sealing stopper with the neck of the container during its adhesion and removal.

Fourth, to effect compression in a regulated degree of the stopper upon the entire area of the neck of the container. The invention consists in the novel construction and combination of parts such as will be first fully described and then specifically pointed out in the claims.

In the drawings:

Figure 1, is a side view of a bottle or container showing the neck and the invention applied thereto.

Fig. 2, is a view of the invention at right angles to that seen in Fig. 1.

Fig. 3, is a plan view of the invention, and

Fig. 4, is a vertical sectional view taken on the line 4-4 of Fig. 3.

Fig. 5, is a detail view of the pin supporting the stopper.

Fig. 6, is a modified view of the invention applied to the neck of a can or jar.

Referring to the drawings, 10 indicates the flask or container and 11 the neck which is externally screw threaded at 12—and having an opening, 13. 14 indicates the closure or bottle stopper which consists of a hollow cap, 15 as shown circular in form, its upper portion being cast solid and its outer surface at 16, extending inwardly in an upwardly and inwardly curved line to form a neck, 17, and in said neck is a vertical opening, 18, extending through said solid portion of the cap, and axially thereto.

In the upper portion of the neck, 17, and

concentric with the opening, 18, is a depression, 19.

In the lower portion of the cap, 15, is a recess or concavity, 20, of a considerable depth and annular in form, the outer surfaces of said recess extending to within a short distance inward from the outer surface of the cap, forming thereby an annular flange, 21, and within which recess and flange is inserted packing, 22, composed of any suitable material, rubber being preferred. This packing is arranged within the recess, 20, in such composite layers that the outer layer of the packing extends a short distance beneath the line of the lower edge of the flange, 21, and its outer circumference adapted to be equal that of the outer circumference of the neck, 11, of the bottle or container.

23 indicates the packing, retaining and cap supporting pin, shown in detail in Fig. 5. The lower portion of the pin is nearly of the same size as the opening, 18, in said cap and upon its lower end is rigidly connected a disk, 24, smaller in circumference than the opening, 13, in the neck of the bottle. The pin 23, extends upwardly within the opening, 18, in the cap, to the recess, 17, and above said recess the pin is reduced in circumference as at 25, forming a shoulder, 26, and extended a short distance above said shoulder.

The pin, 23, is forced upwardly within the opening, 18, in the cap, in the assembling of the parts, until the shoulder, 26, is opposite the recess, 17, at the same time drawing the disk, 24, upwardly against the packing, 22, with considerable pressure. The outer edge of the shoulder 26, is then swagged outwardly so as to force the swagged edge, 27, within the depression, 19, in the upper portion of the cap, so that the pin is held rigid with the cap.

The means for supporting and clamping the cap, 15, upon an aperture such as presented by the neck, 11, of the bottle consists of a flat thumb piece or plate, 28, having a central transverse opening, 29, of increased proportions to that of the said cap, the outer ends, 28', of the plate being outwardly curved and downwardly extended and serving as grasping means for its rotation. In the upper portion of the plate above the opening 29, and equidistant from its ends, is an opening, 30, which receives loosely the

upper reduced end, 25, of the pin, 23, which portion of the plate, 28, rests upon the shoulder, 26, of said pin and is rotatable thereon. The upper end of pin, 23, is upset at 31 so as to form a retainer for the thumb plate, 28, and also permit its rotation.

Upon the threaded portion, 12, of the neck, 11, of the bottle or container is an annular internally screw threaded collar, 32, connected rigidly with the lower portions of the thumb plate, 28, the threaded collar, 32, as shown acting to draw down upon the cap in a clockwise movement and adjustment of the plate, 28.

In the application of the invention to containers or bottles the thumb plate, 28, with the cap is detached from the neck of the bottle or container and the bottle filled with the liquid or substances which may form a vacuum in the neck of the bottle, the cap is replaced and the thumb piece, 28, is turned clockwise, the collar, 32, drawing with equal pressure all bearing portions of the packing, 22, firmly upon the upper edge of the neck of the bottle and at the same time forcing the packing upwardly past the disk 24, which disk in the downward movement of the cap nearly closes the entrance to the neck, the packing being compressed within the recess in the cap no escape of the vapor is possible at any one bearing point of the stopper on the neck of the bottle and a sealing successfully accomplished.

Should a vacuum occur within the neck, an indrawing suction will occur upon the packing and thus increase the adhesion of the packing with the neck of the bottle.

In the reverse movement of the stopper to uncover the neck of the bottle, the adhesion is relieved by direct upward movement of the stopper and as this adhesion is the cause of breakage in the necks of bottles, and the breakage the only means of releasing the contents of the bottle, my invention provides a means of safe-guarding the contents of the bottle, as well, and preventing the breaking of the neck, and the removal of the stopper is made easier on account of the pivotal movement of the operating plate on the stopper instead of a frictional movement of the stopper on the neck.

The invention is particularly adapted to an ever ready hot bottle whose contents are retentive of heat and require immersion in hot water of the bottle. The heating substances when liberated frequently harden the stopper in the neck and the breakage of the neck results from the forcible detachment of the stopper.

Instead of its application to bottles, the invention may be applied to jars or cans as seen in Fig. 6, the neck being screw threaded at 35. The modification employed is in making the cap plate, 33, flat and without the annular recess and with a neck as

seen in Fig. 1, the packing consisting of a rubber ring, 34, on the lower surface of the plate.

One advantage of the invention is that the cap may be made of any shape or form to conform to the various forms of necks of bottles or jars, as no rotation on the stopper or cap is required to release the same from the neck of the bottle.

In preserving operations where the immersion in steam is required and temporary relief from expansion, the invention is of great practical value, and as a sealing factor, is adapted to afford the means for increasing the sealing adhesion from time to time whenever such is required. It is evident that all stoppers which extend within the neck of a bottle will adhere to the neck when contact is made with an adhesive substance. The chemicals used in hot bottles are such that when the liquid hardens the ordinary stopper is very difficult to remove. I am not aware of any previous invention which employs a hollow cap with an elastic sealing packing which is compressed into the hollow cap by an upward pressure from the neck of the bottle and sealed thereon upon the outer and inner edges of the neck in the clamping action of the thumb plate and collar on the screw-threaded neck.

Furthermore, the neck of the cap affords a non-frictional bearing for the thumbpiece, so that the thumbpiece cannot bind upon the cap, and prevent its release under expansion from the heat generated either by the chemical, or from hot water. Neither am I aware of any releasable sealing of a bottle upon the outer and inner edges of the neck so that expansion of the elastic packing has been unconfined; all such methods heretofore being of such nature that the sealing device is confined within the neck of the bottle. The release of the stopper in my invention being directly upward, the sealing will occur within the cap instead of within the neck of the bottle, excluding the air without the necessity of joints.

Such other modifications may be employed as are within the scope of the appended claims.

Having fully described my invention, what I now claim as new and desire to secure by Letters Patent, is:

1. The combination with a container having an externally screw-threaded neck and an internally screw-threaded collar on said neck, and a thumbpiece having downward extensions connected with the collar, of a hollow cap adapted to receive the neck of the bottle, said cap having a central or axial opening and a pin in said opening pivotally connected with said thumb piece at its upper end and a disk on its lower end, adapted to nearly close the entrance to the neck of the bottle in a downward movement of

the cap, and a packing in said hollow cap adapted to be compressed upon the upper edge of the neck of the bottle within the hollow cap in a sealing movement of the bottle within the packing.

2. The combination with a container, having an externally screw-threaded neck, and an internally screw-threaded collar fitted to said neck, and a thumb piece having downward extensions connected with the collar, of a hollow sealing cap having a reduced portion or neck, said cap having a central axial opening, and a pin in said opening

pivotally connected with the thumb piece, whereby the latter obtains a bearing on the neck of said cap, a disk on the lower end of said pin adapted to nearly close the entrance to the neck of the bottle, in a downward movement of said cap, and a packing in said hollow cap adapted to be compressed upon and seal the upper edge of the neck of the bottle within the hollow cap in a sealing movement of the neck of the bottle upon the packing.

CHARLES A. BUNKER.