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3,399,798

SNAP-IN BUNG

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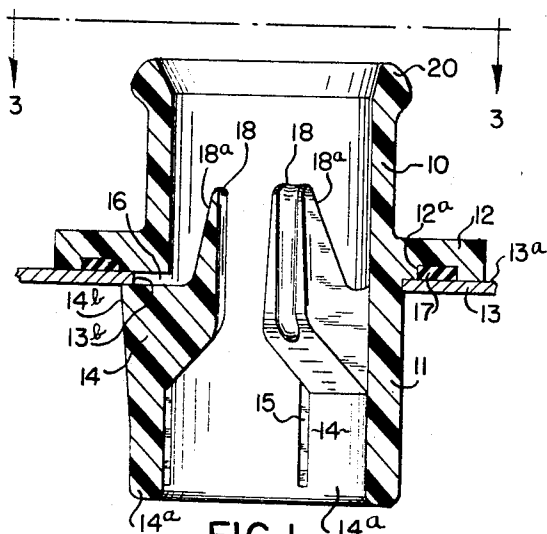


FIG. 1

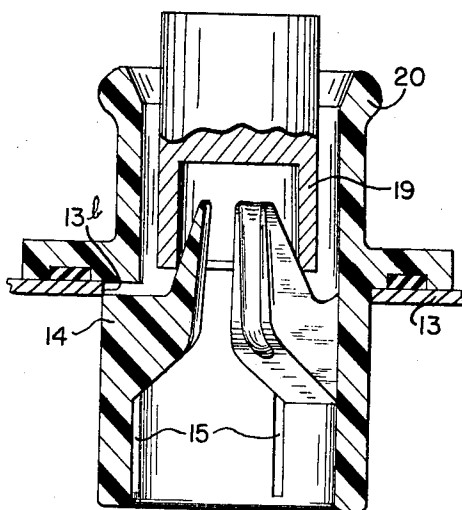


FIG. 2

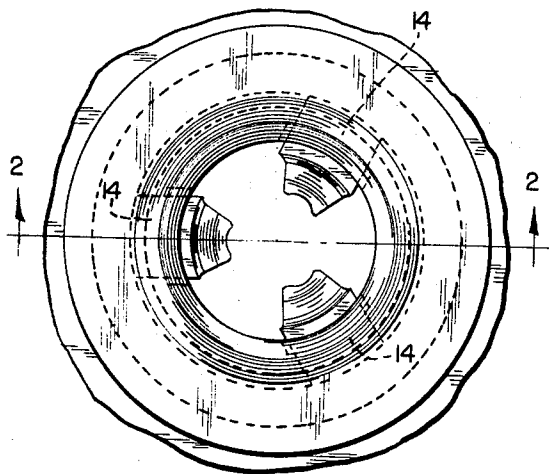


FIG. 3

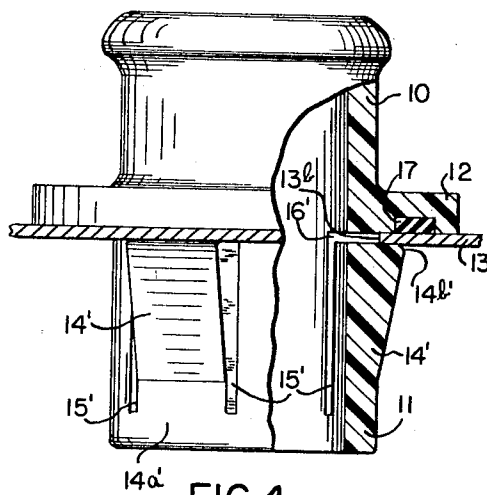


FIG. 4

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SNAP-IN BUNG

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ABSTRACT OF THE DISCLOSURE

A bung adapted for snap-in insertion into a circular hole in a wall of a container has inner and outer tubular portions and between them a radially outwardly extending annular flange adapted to engage the outer face of the wall of the container when the bung is positioned in the opening. The inner tubular portion is of a size to pass through the opening in the container and has a plurality of tongues integral with the inner tubular member and attached at their inner ends only and of such resilient material that these tongues tend to be urged outwardly to a diameter at their upper ends which is greater than the size of the opening in the container. These tongues are squeezed inwardly as the bung is pushed through the opening into the container and the tongues are spaced from the flange by the thickness of the wall of the container so that after the bung is fully inserted the tongues snap radially outwardly beneath the inner face of the wall of the container surrounding the opening.

This invention relates to improvements in a snap-in bung and more particularly to such a removable bung adapted to be secured in an opening in a container by merely pushing the bung into the opening and allowing it to snap into a maintained position.

One of the objects of the present invention is to provide a bung adapted for snap-in insertion into an opening in a flat wall of a container, which bung has inner and outer tubular portions with a radially outwardly extending annular flange between the inner and outer portions which is adapted to engage the outer face of the wall of the container when the bung is positioned properly in the opening. The means for securing the bung in position in the opening consists of a plurality of spring-like tongues rigidly connected at their longitudinally inner ends to the inner tubular portion of the bung and with the outer or free ends of the tongues ending in a common plane at right angles to the axis of the bung and flaring longitudinally and radially outwardly from their inner or connected ends so that the outer ends of the tongues due to their construction normally resiliently extend radially outside the perimeter of the opening. The outer ends of the tongues are spaced from the flange by the thickness of the wall around the edge of the opening so that the bung may have its inner portion pushed through the opening which compresses the outer ends of the tongues radially inwardly until the flange tightly engages against the outer face of the wall of the container, at which point the outer ends of the tongues snap radially outwardly and engage the inner face of the wall of the container radially outside of the edge of the opening so as to hold the bung firmly attached to the wall.

Other objects and advantages of this invention are the provision of such a bung of unitary construction, including means for removing the bung from the container by means of projections on the outer ends of the tongues extending outwardly through the outer tubular portion of the bung and accessible from the outer end of the bung to draw the tongues radially inwardly so as to permit the withdrawal of the bung outwardly through the open-

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ing. A further improvement consists in the above-mentioned bung-removal projections having extensions which extend longitudinally outwardly in radially converging manner so that a tubular removal tool may be forced longitudinally inwardly of the bung so as to move all of the tongues radially inwardly simultaneously so as to cause the tongues to clear the opening for removal of the bung from the container.

Other objects and advantages of this invention will be apparent from the accompanying drawings and description and the essential features thereof will be set forth in the appended claims.

In the drawings,

FIG. 1 is a central sectional view through one form of the invention wherein the retaining tongues of the bung have outwardly extending projections by which the bung may be removed outwardly through the container opening, this view showing the bung firmly attached to the container wall;

FIG. 2 is a view similar to FIG. 1 showing a bung-removal tool extended over the tongue projections so as to cam them radially inwardly permitting the removal of the bung outwardly through the container opening;

FIG. 3 is an end view of the device of FIG. 1 taken from the position of the line 3-3 of FIG. 1; while

FIG. 4 is a side elevational view partly broken away in central section to show a modified form of the invention.

It should be understood that the drawings are enlargements of an actual embodiment of the device so as to more clearly show the construction thereof.

While the bung of this invention might be used for other purposes, one use of the same is illustrated in my copending United States patent application Ser. No. 486,381, filed Sept. 10, 1965, for Spud Lock for Liquid Dispenser. This pending application shows a means for attaching a liquid dispenser to an aluminum beer barrel having a unitary aluminum bung as part thereof to which the dispenser may be attached. A brewery often cleans these barrels after use with a caustic solution which eats away the aluminum to a certain extent during each cleaning and, consequently, the inside diameter of the aluminum bung enlarges and creates a leak when attached to the liquid dispenser of the aforementioned copending United States patent application. Using the present invention with such a container, the aluminum barrel is provided with a circular opening in one head thereof into which the plastic bung of this invention may be inserted after the barrel is filled. This makes for easier cleaning and filling of the container. After the used container is returned by the consumer, the plastic bung may be easily removed with a simple tool after which the barrel is cleaned and refilled and a new plastic bung is inserted. Thus, the inside diameter size of the bung would always be maintained for efficient use with the liquid dispenser and the useful life of the aluminum barrel is thus increased.

Another possible use of the plastic bung of this invention would in the dispensing beer or the like out of a throw-away container. Such a container may be provided having a tear-off tab on the top of the can in the location of similar tabs presently found on smaller beer cans. This tab could be arranged so as to leave a circular hole in the end of the beer can into which the bung of this invention might be inserted and locked in place so that the container could be used with the liquid dispenser of the above-mentioned copending patent application. Such beer cans might contain one gallon or more. The

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consumer would receive a plastic bung which would be a low cost item and which he could insert in the can after removal of the tab so as to be able to use the above-mentioned liquid dispenser in a throw-away container.

It is obvious that this invention might be used on many beverages besides beer.

Referring to FIGS. 1 through 3, while the bung of this invention need not be a unitary device, the preferred form is unitary and constructed of a suitable synthetic plastic material, one of which has been successfully used being a high-impact, styrene-type, rigid, thermoplastic resin suitable for injection molding, one form of which is sold under the trade name Cynolac. The bung has an outward tubular portion 10, and inner tubular portion 11, and a radially outwardly extending annular flange 12 between the inner and outer portions and adapted to engage the outer face 13a of a container wall 13 when the bung is positioned in an opening 13b extending through the wall 13 and preferably circular. A plurality of tongues 14 are provided on the inner tubular portion 11, which tongues at their inner ends 14a are integral with the tubular portion 11 but which are otherwise separated from the tubular portion 11, each tongue having two vertical slots 15, as viewed in FIGS. 1 and 2, and a horizontal slot 16 connecting the tops of the slots 15 so as to separate the tongue for free movement radially inwardly and outwardly about its hinged end 14a. The tongues are so constructed and are of such resilient material that the outer or free ends 14b of the tongues normally take the position shown on the left-hand side of FIG. 1 when under no restraint. When the tongues 14 are compressed radially inwardly, the bung will pass through the opening 13b in the position of the parts shown in FIG. 2, although this part also exhibits the method of removal of a bung from a container.

It should be understood that the longitudinally outer ends 14b of all of the tongues end in a common plane at right angles to the axis of the bung and the tops of the tongues 14b are spaced from the bottom of the flange 12 by approximately the thickness of the wall 13 of the container. It results from this construction that the inner portion of the bung may be pushed through the opening 13b while the edges of the opening cam the free ends 14b of all of the tongues radially inwardly until the flange 12 tightly engages the outer wall 13a of the container. At this time, the outer ends 14b of the tongues are free to snap radially outwardly to the position shown at the left-hand side of FIG. 1 so as to engage the inner face of the container wall 13 and thereby hold the bung firmly attached to that wall.

There need not be a seal between the flange 12 and the container wall 13 but preferably such a seal is formed as shown in FIGS. 1 and 2 and comprises an annular ring 17 of rubber or similar resilient sealing material which is held in an annular recess 12a in the flange 12 on the side thereof toward the outer surface 13a of the container. Such a seal is placed under slight compression when the bung is secured in place as shown in FIG. 1 and effectively seals against any leak of pressure there. It should be understood that the portion of the flange 12 outside of the recess 12a prevents any liquid dispensing pressure from blowing the gasket or seal 17 radially outward.

If it is desired to remove the bung from the container instead of simply throwing it away with the container, then each of the tongues 14 is provided with a bung-removal projection 18 extending radially inwardly from its associated tongue and then longitudinally outwardly and accessible through the tubular portion of the outer bung part 10 to draw the outer ends of the tongues 14 radially inwardly so as to permit the withdrawal of the bung outwardly through the opening 13b.

A simple arrangement for bung removal is clearly shown in FIGS. 1, 2 and 3 where the projections 18 have surfaces 18a which extend longitudinally outwardly in a

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radially converging manner so that a tubular removal tool 19 may be forced longitudinally inwardly of the bung so as to cause the tongue outer ends 14b to be forced radially inwardly so that they clear the opening 13b, thus permitting easy removal of the bung outwardly through the opening.

A modified form of this invention, not provided with any removal means, is shown in FIG. 4. Here all of the parts which are the same as in the first described embodiment are given the same reference characters, 10 for the outer tubular portion, 11 for the inner tubular portion, 12 for the flange, 13 for the container wall and 17 for the annular seal. The tongues 14', of which three are used equally spaced circumferentially, are of resilient slightly spring-like quality and so formed that when in unstressed condition the upper ends thereof 14b' extend radially outwardly beyond the periphery of the opening 13b as shown at the right-hand side of FIG. 4. Each tongue is integral with the inner tubular portion 11 at its longitudinally inward end 14a'. Here, as in the first embodiment, each tongue is separated from the inner tubular portion 11 by parallel vertically extending slots 15', and across the outer end by a horizontally extending slot 16'.

The enlarged bead 20 at the outer end of the bung is for cooperation with the liquid dispenser of the above-mentioned copending patent application.

This invention thus provides a quickly insertable bung which is easily locked in position in a suitable receiving opening in a container wall and quickly removable therefrom if desired by providing the locking tongues with bung removal projections as described.

I claim:

1. A bung adapted for snap-in insertion into an opening in a flat wall of a container, said bung having an inner tubular portion whose outer surface generally conforms to the shape of said coating opening and having an outer tubular portion and having a radially outwardly extending annular flange between said inner and outer portions and adapted to engage the outer face of said wall when said bung is positioned in said opening, the inner edge of said flange closely conforming to the periphery of said opening, a plurality of spring-like tongues rigidly connected at their inner ends only to said inner tubular portion, the outer ends of said tongues ending in a common plane at right angles to the axis of said inner tubular portion and flaring longitudinally and radially outwardly from their inner ends so that the outer ends of said tongues normally resiliently extend radially outside the perimeter of said opening, and the outer ends of said tongues being spaced from said flange by the thickness of said wall around the edge of said opening, whereby said bung may have its inner portion pushed into said opening while the outer ends of said tongues are compressed radially inwardly until said flange tightly engages the outer face of said wall after which said outer ends of said tongues snap radially outwardly and engage its inner face of said wall radially outside of said opening and hold said bung firmly attached to said wall.

2. A bung as defined in claim 1 wherein said inner and outer tubular portions and said flange and said tongues are unitary.

3. A bung as defined in claim 2 wherein said bung is of synthetic plastic material, said tongues are parts of said inner tubular portion connected thereto at their inner ends only, and said plastic material is sufficiently resilient to give spring-like action to said tongues.

4. A bung as defined in claim 3 including bung-removal projections on the outer ends of all of said tongues extending radially inwardly therefrom and accessible through said outer tubular portion to draw the outer ends of said tongues radially inwardly and to permit withdrawal of said bung outwardly through said opening.

5. A bung as defined in claim 4, wherein said bung-removal projections have extensions within said outer

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tubular portion which extend longitudinally outwardly in radially converging manner so that a tubular removal tool may be forced longitudinally inwardly of said bung and force said tongue outer ends radially inwardly to cause said tongues to clear said opening.

6. A bung as defined in claim 1 including a sealing gasket between said flange and said wall, and means on said flange preventing escape of said gasket radially outwardly.

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