# United States Patent [19]

**Duncan**

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[45] **Aug. 27, 1974**


[54] **UNCASER CUP**


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[30] **Foreign Application Priority Data**

June 8, 1973 Canada ..... 173614

[52] **U.S. Cl.** ..... **294/90**, 294/63 A, 294/99 R

[51] **Int. Cl.** ..... **B66c 1/46**

[58] **Field of Search** ..... 294/63 A, 64 R, 65, 86 R, 294/87 R, 90, 93, 99 R, 88



[56] **References Cited**

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[57] **ABSTRACT**

The invention relates to a bottle pick-up device where a rubber liner within a cup or holder is inflated by air so as to grip the top of the bottle with a metal insert being located within the liner so that inflation of the latter will only occur at its lower operative end instead of throughout its length thereby effecting a more positive gripping action between the top of the bottle and the rubber liner.


**3 Claims, 4 Drawing Figures**

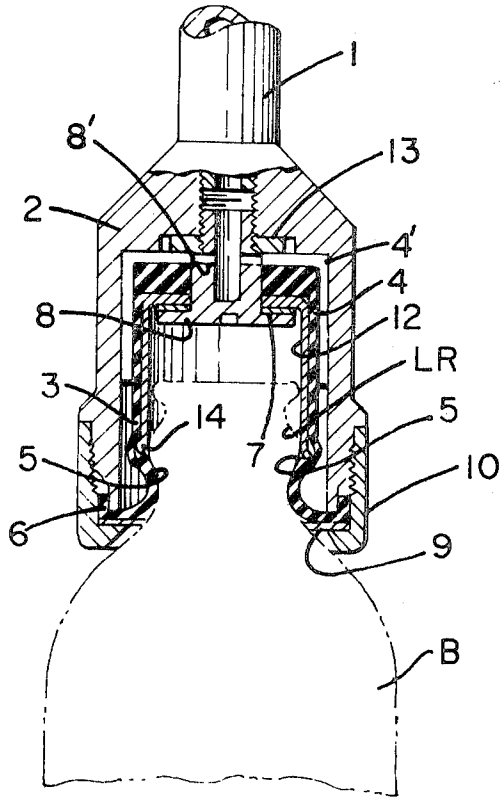


FIG. 1

PRIOR ART

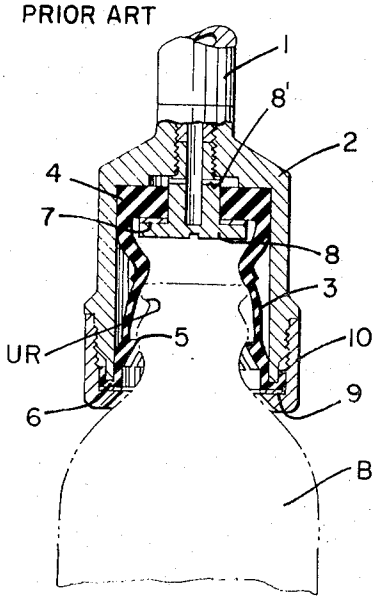



FIG. 2

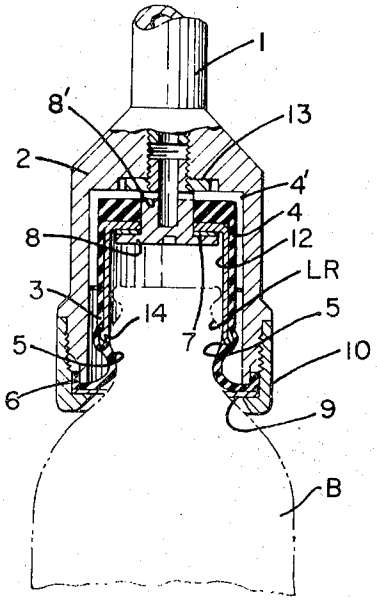



FIG. 3

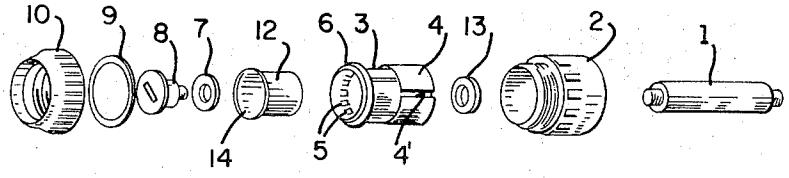
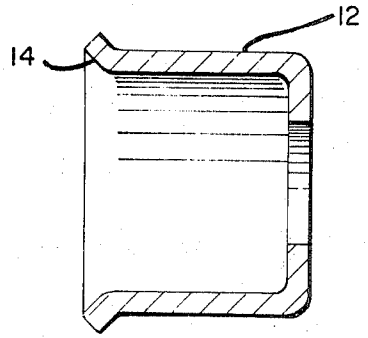



FIG. 3A



# UNCASER CUP

The invention relates to a bottle handling device. Bottled beverages are usually sold in non-returnable or returnable bottles and it is to the latter type of bottle that the present invention is directed.

When returnable bottles reach the beverage manufacturer, they must be uncased before passing through a sterilizer. Uncasing machines are well known and essentially consist of a number of uncaser heads, say four to six, with each head including 24 bottle pick-up cups. Each cup is caused to descend over and upon the top of an empty bottle whereupon, and as will be described herein, the cup will pick up the bottle vertically from the carton or box in which it has been returned and will convey it, in a substantially horizontal plane, from the bottle pick-up station to a load conveying table leading to a bottle sterilizing machine. When the cup and its depending bottle is located over such a table, the cup is caused to release the bottle which then falls by gravity approximately ½ inch on to the table.

Each cup has, heretofore, included a rigid holder with a resilient rubber liner disposed therein having a serrated inner periphery. When such a cup has been disposed over and around the top of an empty ottle, air has been admitted to the device between the inner periphery of the holder and the outer periphery of the liner. This has caused the liner to bell inwardly and to grip the top of the bottle during the above conveying operation until such times that it has been desired that the bottle should be deposited on the table whereupon the air has been evacuated from the device thus causing the liner to release its grip on the top of the bottle.

However, such bottle handling devices have not always functioned perfectly under humid conditions. Quite high, moist and humid conditions are usually encountered in breweries and such conditions worsen during humid spells of weather. This causes slippage between the rubber liners and the tops of the bottles. Additionally, the rubber liners become deformed owing to their constant inflation and deflation so that they only grip the tops of the bottles in odd spots instead of all around the peripheries of such tops.

In the case of the device operating under humid conditions and in the case of defomed liners, the results have sometimes been disasterous because either certain of the bottles have been left behind or, far worse, the bottles have been dropped mid-way during their path of travel. It is not uncommon to utilize and gang five or six uncaser machines which means that there can be anywhere between **600 - 850** bottles suspended by the devices simultaneously. If either or both of the abovementioned conditions become factors, a large number of bottles may either be left behind or may be dropped before the operator can shut down the power to the machines.

It is the object of the present invention, therefore, to provide a bottle handling device which will overcome the above disadvantages.

The invention is illustrated in the accompanying drawings in which:

FIG. 1 is a vertical section taken through a prior art type of bottle handling device;

FIG. 2 is a similar view taken through the device forming the subject of the present invention;

FIG. 3 is an exploded view of the components forming the device of FIG. 2; and



FIG. 3A is a detail view.

Referring to the drawings, and firstly to FIG. 1, the prior art bottle handling device has included a centrally bored stem 1, permitting the entrance of air, under pressure, to the interior of the device when connected to any suitable source of air supply (not shown). The lower end of the stem is detachably connected to a rigid holder 2 which contains a resilient rubber liner 3 the upper end 4 of which is thicker than the lower end, said upper end being provided with axial peripheral air grooves 4' (FIG. 3). The inner periphery of the liner 3, adjacent its lower end, is provided with a plurality of projecting wedge-shaped projections 5. The lower terminal end of the liner 3 is provided with a projecting flange 6 which fits over the lower terminal end of the holder 2. The liner 3 is maintained within the holder 2 by means of a washer 7 and a centrally bored screw 8 having radial air passages 8', said screw passing through the upper terminal end of liner 3 and into the holder. The liner 3 is also maintained in position by means of a gasket 9 and retaining ring 10 in threaded engagement with the lower end of the holder 2. Inasmuch as the lower end of the liner 3 is thinner than the upper end 4, said lower end will bell inwardly when air is admitted to the device via the bored stem 1, the radial air passages 8' of the centrally bored screw 8, and the peripheral air grooves 4' of the liner. This will enable the wedge-shaped gripping projections 5 located on the inner periphery of the liner adjacent its lower terminal end to grasp the periphery of the upper ring UR on the neck of the bottle B. However, and as has been stated above, this is not too satisfactory under certain conditions.

The bottle handling device forming the subject of the present invention is shown in FIGS. 2 and 3 to which reference should now be made.

The device shown in FIGS. 2 and 3 is so similar to that shown in FIG. 1 that like references have been employed with the exception of the metal insert 12 which is located within the liner 3 and which is maintained in position by the screw 8 with a spacer 13 being provided between the upper terminal end of the liner 3 and the inside of the top of the holder 2. As will be seen more clearly from FIG. 3A, the terminal edge of the insert 12 is curved outwardly, as at 14, and it is this portion of the insert which presses into the inner periphery of the liner 3 just above the wedge-shaped gripping projections 5. Accordingly, when air is admitted to the interior of the device of FIG. 2, the insert 12 will inhibit inward radial movement of the liner except for that portion bearing the wedge-shaped gripping projections 5. Thus, when the device forming the subject of the present invention is in operation, as is shown in FIG. 2, the liner 3 will grip the bottle B in a more positive fashion than heretofore and just below the lowermost ring LR on the neck of the bottle with the curved edge 14 of the insert causing the lower end of the insert 3 to expand substantially concentrically around the top of the bottle.

Use of the metal insert 12 has, by practical experience, shown that the rubber inserts 3 do not have to be replaced so frequently as before which has meant a considerable saving in replacement parts and the cost of labour for effecting such replacements. It will be appreciated also that the spacer 13 forms a ready means for adjusting the insert 12 to its correct operating relationship with respect to the liner 3 whereby the grip-

ping action of the latter will be as correct as possible.

The present invention also has the advantage of reducing the amount of air volume required to inflate the rubber liner **3** because of the restriction placed on the latter by the insert **12.** This reduction in air volume reflects a pressure increase in the entire bottle uncasing system.

Finally, bottle handling devices forming the present invention have been thoroughly tested under completely adverse conditions which have included the spraying of the necks of bottles with water and the coating of said necks with oil. In all cases, the said devices have functioned consistently without leaving bottles behind or dropping them.

I claim:

**1.** A pneumatically operated bottle pick-up device including a rigid holder with a rubber liner mounted therein, said liner being radially deformable under air pressure to grip the tops of bottles; and a rigid insert within said liner inhibiting such deformation throughout the major portion of the length of said liner while permitting such deformation over the remainder of the length of the liner concentrically in relation to the top of the bottle.

**2.** A device according to claim **1** wherein one end of the insert is substantially closed and wherein the other end is open, the circumferential edge of said open end being outwardly curved towards the inner periphery of the liner.

**3.** A device according to claim **2** wherein the insert is detachably secured within the liner and to the holder, spacer means being provided for correct operating relationship between the liner and the insert.

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