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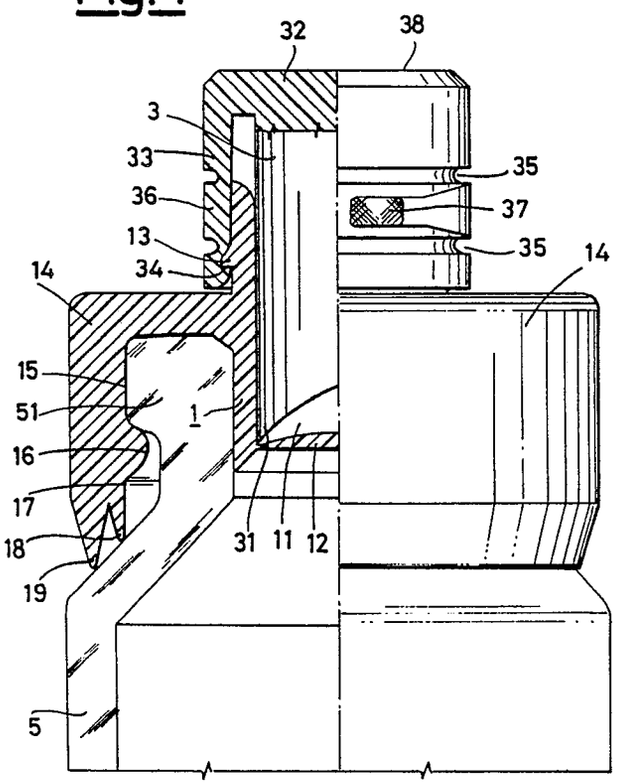
(54) Container cap for powders.

(57) The container cap for powders, applicable to a bottle provided with a mouth equipped with a protruding lip, comprises (a) a housing provided with a substantially cylindrical cavity whose lower extremity is closed by a detachable diaphragm and (b) a substantially cylindrical and hollow piston, wherein the upper extremity is closed while the lower one is in the shape of a flutemouth; said housing is provided with a first circular rib and with an annular element, whose perpendicular cross-section is in the shape of an inverted L, which extends below and not far from said first circular rib and is provided, inside, with a second circular rib so as to form a seat suitable for receiving and holding the protruding lip of said bottle. From the upper extremity of said piston there extends an annular element whose perpendicular cross-section is also in the shape of an inverted L and is provided, inside, with a circular groove so as to form a seat suitable for receiving and holding the part of said housing which is above the annular element of the same housing, said annular element of said piston being also provided with two circular weakening lines which thus define a band which can be detached by tearing.

Fig.1



EP 0 344 849 A2

Container cap for powders

The present invention relates to a container cap for powders applicable to a bottle whose mouth is provided with a protruding lip.

It is known that some solutions are stable over a limited period of time. In such case their preparation is extemporaneous.

In the particular case of drinkable solutions, the most widespread type of package comprises a single dose bottle whose mouth is provided with a protruding lip, a small plastic glass provided with a lip suitable for being placed over the mouth of the bottle, a flutemouth-shaped piston suitable for being inserted in a slidable way in said small glass and an aluminium ring nut provided with a seat suitable for housing the upper extremity of the piston.

The preparation of said type of package implies the following stages: metering the desired quantity of solvent in said bottle, metering the desired quantity of powder containing the active principle(s) in said small glass, insertion of said flutemouth-shaped piston in said small glass in order that the pressure exerted on the piston is not such as to cause the detachment of the bottom of the small glass, placement of the small glass over the bottle's mouth, placement of the aluminium ring nut on the glass-piston assembly and folding of its lower lip under the protruding lip. The package is thus made integral with the bottle.

When it is to be used the aluminium ring nut is removed, the piston is pressed to cause the detachment of the bottom of the small glass and the simultaneous fall of the powder into the bottle, the bottle is shaken to promote the dissolution of the powder in the solvent, the glass-piston assembly is removed and the contents of the small bottle may thus be drunk.

It is evident that this type of package is somewhat complex and that the packaging process is also laborious and requires a larger number of fixtures. This substantially affects costs both of the material and of the process.

In particular, the cost of the aluminium ring nut is about equal to, if not greater than, the overall cost of the small glass and of the piston.

The need is therefore still keenly felt for a package of single dose drinkable bottles which is inexpensive and which can be prepared more quickly by the automatic packaging machines thus increasing productivity appreciably.

An object of the present invention is to satisfy the above need by means of a container cap for powders, applicable to a bottle whose mouth is provided with a protruding lip, comprising (a) a housing having a substantially cylindrical cavity whose lower extremity is closed by a detachable diaphragm and (b) a substantially cylindrical piston, wherein the upper extremity is closed while the lower one is in the shape of a flutemouth, characterized in that said housing is provided with a first circular rib and with an annular element, whose perpendicular cross-section is in the shape of an inverted L, which extends below and not far from said first circular rib and is provided with a second circular rib so as to form a seat suitable for receiving and holding the protruding lip of the mouth of said bottle, and in that from the upper extremity of said piston there extends an annular element whose perpendicular cross-section is also in the shape of an inverted L and is provided, inside, with a circular groove so as to form a seat suitable for receiving and holding the part of said housing which is above the annular element of the same housing, said annular element of said piston being also provided with two circular weakening lines which thus define a strip detachable by tearing.

The advantages offered by the container cap according to the present invention are evident when it is considered that the aluminium ring nut is not provided for since the housing of the filler cap is equipped with means to make it integral with the protruding lip with which the mouth of the bottle is provided. In addition, said housing and said piston are also provided with means suitable for co-operating together acting as a seal guarantee.

These and other advantages shall appear evident to an artisan from the present description and from the enclosed drawings which illustrate an embodiment of the present invention and wherein:

Fig. 1 is a partially sectioned side view of the container cap according to the present invention as it appears when it contains the powder (not illustrated);

Fig. 2 is an axial cross-section of the container cap according to the present invention mounted on a bottle as it appears after the tear strip has been removed, the piston has been pushed downwards and the powder has fallen into the bottle.

Fig. 1, shows that the container cap is constituted by a housing 1 and by a piston 3. The housing 1 is provided with a substantially cylindrical cavity 11 whose lower extremity is closed by a detachable diaphragm 12. In turn the piston 3 is substantially cylindrical and hollow and terminates in the shape of a flutemouth 31 while its upper extremity is closed.

The housing 1 is provided with a first circular rib 13 and with an annular element 14 which extends from said housing 1 a little below and not far

from said first circular rib 13. As can be seen from Fig.s 1 and 2, the cross-section of said annular element 14 is in the shape of an inverted L. In addition, said annular element 14 is provided, on its internal face 15 parallel to said housing 1, with a second circular rib 16. Thanks to this particular conformation, the housing 1 is thus provided with a seat suitable for receiving and holding the protruding lip 51 of the bottle 5.

Fig. 1 also shows that from the closed extremity 32 of the piston 31 there extends an annular element 33, whose cross-section is also in the shape of an inverted L, and which is provided, inside, with a groove 34. This particular conformation of the annular element 33 constitutes a seat suitable for receiving and holding part of the housing which is above the annular element 14.

Said annular element 33 is also provided with two weakening lines 35 which define a strip 36 detachable by tearing favoured in this by a tab 37.

The height of the strip 36 is preferably such as to prevent the piston 3 from causing the total detachment of the diaphragm 12 when the piston 3 is pushed completely downwards. Lastly, Fig. 1 shows that the lower part of the annular element 14 is provided, inside, with an invitation 17 and, at its extremity, with two flexible tongues 18 and 19 which can flex if and when they come into contact with the convex part of the bottle. This can occur, for example, when the neck of the bottle is shorter than that illustrated in Fig. 1.

Fig. 2, shows an axial cross-section of the container cap according to the present invention after the strip 36 has been removed, the piston 3 has been pushed downwards thus causing, thanks to the flutemouth conformation of its lower part 31, the almost total detachment of the diaphragm 12 and the fall of the powder (not illustrated) into the bottle.

The container cap according to the present invention offers the advantage that it can be made of very inexpensive materials and that it has been designed to satisfy all needs imposed by the automatic packaging machines, of the usual type, provided with a certain number of stations in each of which a particular function is carried out. In addition, since it is constituted by only two elements, it offers the advantage of reducing the number of stations present in the packaging machines.

Thus, in the case of the container cap according to the present invention, in a first station the powder (not illustrated) is metered in the chamber 11, in a second station the piston 3 is inserted, in the third station a suitable pressure is exerted on the surface 38 so that the groove 34 engages the first circular rib 13, in the fourth station the invitation 17 of the container cap is positioned over the mouth of the bottle (into which the liquid, not illustrated, has previously been metered) and, lastly, in the fifth station a suitable pressure is exerted on the container cap according to the present invention so that the protruding lip 51 of the bottle engages the second circular rib 16. The filler cap is thus pressure fitted onto the bottle and assumes the position illustrated in Fig. 1.

In the passage from one station to the other, the material moves on a conveyor belt which exerts an oscillating force on it tending to overturn it. The conformation of the container cap according to the present invention avoids this drawback during the first three stages thanks to its wide base which confers a very high stability to it and during the fourth stage, when it is placed over the bottle during the passage between the fourth and the fifth station, thanks to the circular invitation 17 which firmly girds the mouth of the bottle.

When it is to be used, the tab 37 is grasped and the strip 36 outlined by the pre-breakage or weakening lines 35 is removed by tearing. The piston 3 is pressed thus causing the detachment of the diaphragm 12 and the fall of the powder (not illustrated) into the solvent (not illustrated) contained in the bottle. The position of the container cap after this stage is illustrated in Fig. 2. If necessary, the bottle is then shaken to encourage the powder's dissolution.

Once dissolution is complete, the piston 3 is extracted. At this point the solution may be drunk.

The housing 1 and the piston 3 are preferably constituted by semi-rigid polymer material such as polypropylene and polyethylene.

Other embodiments may be easily accomplished without departing from the inventive idea illustrated above.

Claims

1. Container cap for powders, applicable to a bottle (5) equipped with mouth provided with a protruding lip (51), comprising (a) a housing (1) equipped with a substantially cylindrical cavity (11) whose lower extremity is closed by a detachable diaphragm (12) and (b) a substantially cylindrical and hollow piston (3), wherein the upper extremity is closed while the lower one is in the shape of a flutemouth (31), characterized in that said housing (1) is provided with a first circular rib (13) and with an annular element (14), whose perpendicular cross-section is in the shape of an inverted L, which extends below and not far from said first circular rib (13) and is provided, inside, with a second circular rib (16) so as to form a seat suitable for receiving and holding the protruding rib (51) of the mouth of said bottle (5), and in that from the upper extremity (32) of said piston (3) there

extends an annular element (33) whose perpendicular cross-section is also in the shape of an inverted L and is provided, inside, with a circular groove (34) so as to form a seat suitable for receiving and holding the part of said housing (1) which is above the annular element (14) of the housing itself, said annular element (33) of said piston (3) being also provided with two circular weakening lines (35) which thus define a band (36) which can be detached by tearing.

Fig.2

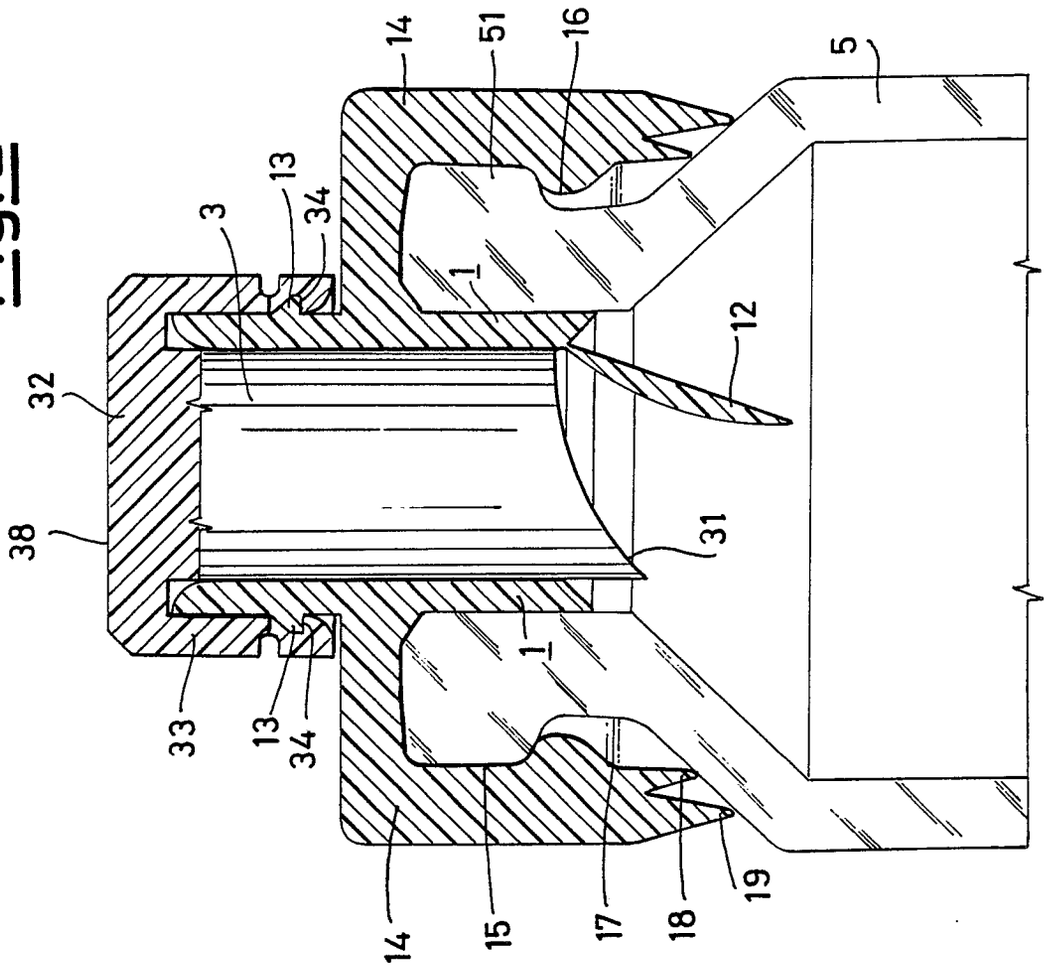

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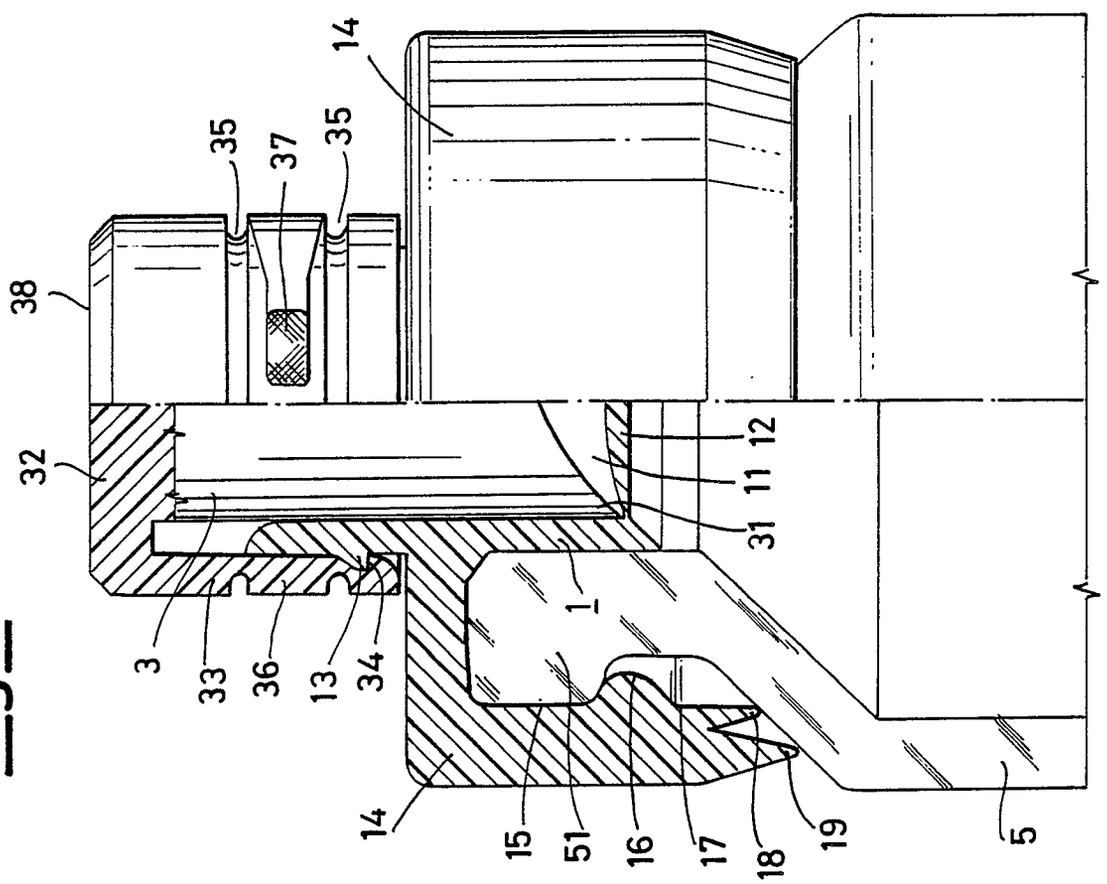
Fig.1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