

Description

[0001] The present invention relates to a closure device for a beverage bottle.

BACKGROUND OF THE INVENTION

[0002] Double-caps for bottles are known in general. While the inner cap is the one actually used for closing the bottle, the outer cap provides an enlarged size to facilitate handling and flexibility in terms of design of appearance.

[0003] The invention seeks to provide an improved closure device of this type in general.

SUMMARY OF THE INVENTION

[0004] According to the invention, there is provided a closure device for a bottle having a top end portion including a relatively smaller mouth portion atop. The closure device comprises an inner cap for screwing onto and thus closing the bottle mouth portion and includes an outer shell enclosing and supporting the cap. The cap is separable from the shell. The shell comprises a peripheral wall having an open bottom side for enclosing and surrounding the bottle top end portion and includes integrally an internal inverted collar surrounding and locating the cap. The collar has a lower rim and a plurality of resiliently deformable retaining formations projecting downwardly from the rim and disposed around the cap. Each formation includes a lateral protrusion on its inner surface engaging the cap by its rim through a snap action, thereby retaining the cap within the shell.

[0005] Preferably, each retaining formation comprises a tab.

[0006] It is preferred that each lateral protrusion has upper and lower ends that are relatively thinner than its middle portion.

[0007] More preferably, each lateral protrusion has a tapered upper end and a tapered lower end.

[0008] It is preferred that the collar includes on its inner surface a plurality of thin protrusions engaging the cap against relative rotation.

[0009] Preferably, the peripheral wall of the shell has a bottom outer shape and size substantially the same as an uppermost outer shape and size of an upper portion of said bottle adjoining said top end portion from below.

[0010] More preferably, the peripheral wall of the shell has a bottom outer surface for lying substantially flush with an uppermost outer surface of the upper portion of said bottle.

[0011] It is preferred that the peripheral wall of the shell has a bottom rim that defines the open bottom side.

[0012] It is preferred that the shell has a substantially frusto-conical shape.

[0013] Advantageously, the shell includes a substantially flat top wall.

[0014] For convenience, the shell includes on its outer surface a plurality of depressions to enhance gripping.

[0015] It is preferred that the cap comprises a cylindrical peripheral wall and a flat top end wall integral therewith.

[0016] It is preferred that the cap comprises a standard bottle cap.

[0017] The invention also provides the aforesaid closure device in combination with a bottle which has said top end portion including said relatively smaller mouth portion atop closable by the cap and includes an or said upper portion adjoining the top end portion. The top end portion is slightly reduced in size along its interface with the upper portion to accommodate the thickness of the peripheral wall of the shell.

BRIEF DESCRIPTION OF DRAWINGS

[0018] The invention will now be more particularly described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a side view of a water bottle and an embodiment of a closure device therefor in accordance with the invention;

Figure 2 is a side view corresponding to Figure 1, showing the closure device closing the bottle of Figure 1; and

Figure 3 is an enlarged cross-sectional side view of the closure device and an upper end of the bottle of Figure 2.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0019] Referring to the drawings, there is shown a closure device 100 embodying the invention for closing a plastic bottle 200 that is intended to contain beverage such as water for example. The bottle 200 has an upwardly converging top end portion 210 including a mouth portion 220 atop, and an upper portion 230 integrally adjoining the top end portion 210 from below. Along its interface with the upper portion 230, the top end portion 210 is slightly reduced in size, i.e. having a slightly smaller diameter, whereby a small annular step or shoulder 240 is formed between the two portions 210 and 230. The mouth portion 220 is considerably smaller than the rest of the top end portion 210, and is formed with external screw threads.

[0020] The closure device 100 comprises an inner plastic cap 110 for screwing onto and thus closing the mouth portion 220 of the bottle 200, and includes an outer plastic shell 120 that encloses and supports the cap 110 for use normally together as a single double-cap unit. The cap 110 is a standard cylindrical cap, i.e. having a cylindrical peripheral wall 112 and a horizontal flat

top wall 114 integral therewith. The peripheral wall 112 is formed with internal screw threads for inter-engagement with the screw threads of the bottle mouth portion 220, when the cap 110 closes the mouth portion 220. The peripheral wall 112 has a knurled outer surface to enhance gripping by a user for turning.

[0021] The shell 120 is substantially frusto-conical in shape, having an upwardly converging peripheral wall 122 and a horizontal flat top wall 124 integral therewith. The peripheral wall 122 has a bottom rim 126 defining a circular open bottom side 126, and is used for enclosing and surrounding the top end portion 210 of the bottle 200. More specifically, the peripheral wall 122 has a bottom outer shape and size substantially the same as an uppermost outer shape and size of the upper portion 230 of the bottle 200, for matching therewith.

[0022] In order to achieve a streamlined transition between the shell 120 and the bottle 200, the peripheral wall 122 has a bottom outer surface for lying substantially flush with an uppermost outer surface of the upper portion 230, while the bottom rim 126 or its thickness is accommodated by the annular shoulder 240. Although a small annular gap G is formed between the peripheral wall 122 and the upper portion 230, this gap G should be rendered as narrow as possible.

[0023] The shell 120 is formed with a few finger depressions 128 around its rough outer surface to enhance gripping by a user for turning. The shell 120 includes an internal collar 130 that is depending co-axially and integrally from the shell's top wall 124 and/or from the shell's peripheral wall 122 at a small distance below the top wall 124. The collar 130 forms a downwardly open cylindrical seat marginally larger than the cap 110 for locating the cap 110 as a tight fit. A number of small protrusions 129 are integrally formed around the inner surface of the shell wall 122 and/or wall 124, on the upper side of the collar 130, to define the bottom of seat for bearing by the cap 110.

[0024] The collar 130 has a peripheral wall 132 having an inner surface that is knurled or serrated, such as formed with a plurality of thin integral ribs for gripping the cap 110 by its knurled outer surface against relative rotation. This ensures that the cap 110 will rotate simultaneously with the shell 120 without slippage, as the shell 120 is turned by a user, such that the combined cap 110 and shell 120 can be screwed onto and/or unscrewed from the bottle 200 as a single cap.

[0025] For holding the cap 110 in place, the collar 130 includes three pairs of retaining latches in the form of tabs 134 depending integrally from the lower rim of the collar 130, said pairs being equi-angularly spaced around the collar 130. The tabs 134 are resiliently deformable and thus flexible to a limited extent. Each tab 134 includes an integral lateral protrusion 136 on the inner surface thereof, extending from the inner surface of the collar 130. The protrusions 136 are positioned right beyond the bottom rim of the cap 110 for hooking or latching the cap 100 by its rim through a snap action.

[0026] Each protrusion 136 has a convex cross-section or a cross-section that tapers upwards and downwards when viewed from either left or right side as shown, such that its upper and lower ends are relatively thinner compared with its middle portion. Given the limited flexibility of the tabs 134, the lower protrusion ends permit the cap 110 to be snapped into the collar 130, and the upper protrusion ends permit the cap 110 to be snapped out of the collar 130.

[0027] The cap 110 can be snapped out of the collar 130 while it is on the mouth portion 220 of the bottle 200, by a user pulling the shell 120 away with his/her fingernails nipping behind the shell rim 126 through the gap G.

[0028] The double-tapered protrusions 136 render fitting of the cap 110 inside the collar 130 of the shell 120 relatively easy, without causing scratches to both parts 110 and 130. This feature makes it possible to fit the shell 120 by automatic machinery onto a capped bottle, and precision alignment is not needed.

[0029] The shell 120 is used for use as an aid to unscrew the cap 110 of a bottled beverage. As the shell 120 and cap 110 are separate parts, they can be manufactured separately with the flexibility of the shell 120 being made by less precise plastic injection moulding machines. Production of integral caps/shells or double-caps can be relatively expensive as this would attract payment of royalty fees to the inner cap design owners.

[0030] The cap 110 is of course made of a food grade material. The shell 120 is likewise made of a food grade material, as, while having the flat top wall 124, it can be used on its own in the upside-down position as a cup that can stand on a flat surface.

[0031] The invention has been given by way of example only, and various modifications of and/or alterations to the described embodiment may be made by persons skilled in the art without departing from the scope of the invention as specified in the appended claims.

Claims

1. A closure device (100) for a bottle (200) having a top end portion (210) including a relatively smaller mouth portion (220) atop, said closure device (100) comprising an inner cap (110) for screwing onto and thus closing said mouth portion (220) and including an outer shell (120) enclosing and supporting the cap (110), the cap (110) being separable from the shell (120), the shell (120) comprising a peripheral wall (122) having an open bottom side (126) for enclosing and surrounding said bottle top end portion (210) and including integrally an internal inverted collar (130) surrounding and locating the cap (110), **characterised in that** the collar (130) has a lower rim and a plurality of resiliently deformable retaining formations (134) projecting downwardly from the rim and disposed around the cap (110), each formation (134) including a lateral protrusion (136) on

its inner surface engaging the cap (110) by its rim through a snap action, thereby retaining the cap (110) within the shell (120).

2. The closure device (100) as claimed in claim 1, **characterised in that** each retaining formation (134) comprises a tab (134). 5
3. The closure device (100) as claimed in claim 1, **characterised in that** each lateral protrusion (136) has upper and lower ends that are relatively thinner than its middle portion. 10
4. The closure device (100) as claimed in claim 3, **characterised in that** each lateral protrusion (136) has a tapered upper end and a tapered lower end. 15
5. The closure device (100) as claimed in claim 1, **characterised in that** the collar (130) includes on its inner surface a plurality of thin protrusions engaging the cap (110) against relative rotation. 20
6. The closure device (100) as claimed in claim 1, **characterised in that** the peripheral wall (122) of the shell (120) has a bottom outer shape and size substantially the same as an uppermost outer shape and size of an upper portion (230) of said bottle (200) adjoining said top end portion (210) from below. 25
7. The closure device (100) as claimed in claim 6, **characterised in that** the peripheral wall (122) of the shell (120) has a bottom outer surface for lying substantially flush with an uppermost outer surface of the upper portion (230) of said bottle (200). 30
8. The closure device (100) as claimed in claim 1, **characterised in that** the peripheral wall (122) of the shell (120) has a bottom rim (126) that defines the open bottom side (126). 35
9. The closure device (100) as claimed in claim 1, **characterised in that** the shell (120) has a substantially frusto-conical shape. 40
10. The closure device (100) as claimed in claim 1, **characterised in that** the shell (120) includes a substantially flat top wall (124). 45
11. The closure device (100) as claimed in claim 1, **characterised in that** the shell (120) includes on its outer surface a plurality of depressions (128) to enhance gripping. 50
12. The closure device (100) as claimed in claim 1, **characterised in that** the cap (110) comprises a cylindrical peripheral wall (112) and a flat top end wall integral therewith (114). 55

13. The closure device (100) as claimed in claim 1, **characterised in that** the cap (110) comprises a standard bottle cap (110).

14. The closure device (100) as claimed in any one of claims 1 to 13, in combination with a bottle (200) which has said top end portion (210) including said relatively smaller mouth portion (220) atop closable by the cap (110) and includes an or said upper portion (230) adjoining the top end portion (210), **characterised in that** the top end portion (210) is slightly reduced in size along its interface with the upper portion (230) to accommodate the thickness of the peripheral wall (122) of the shell (120).

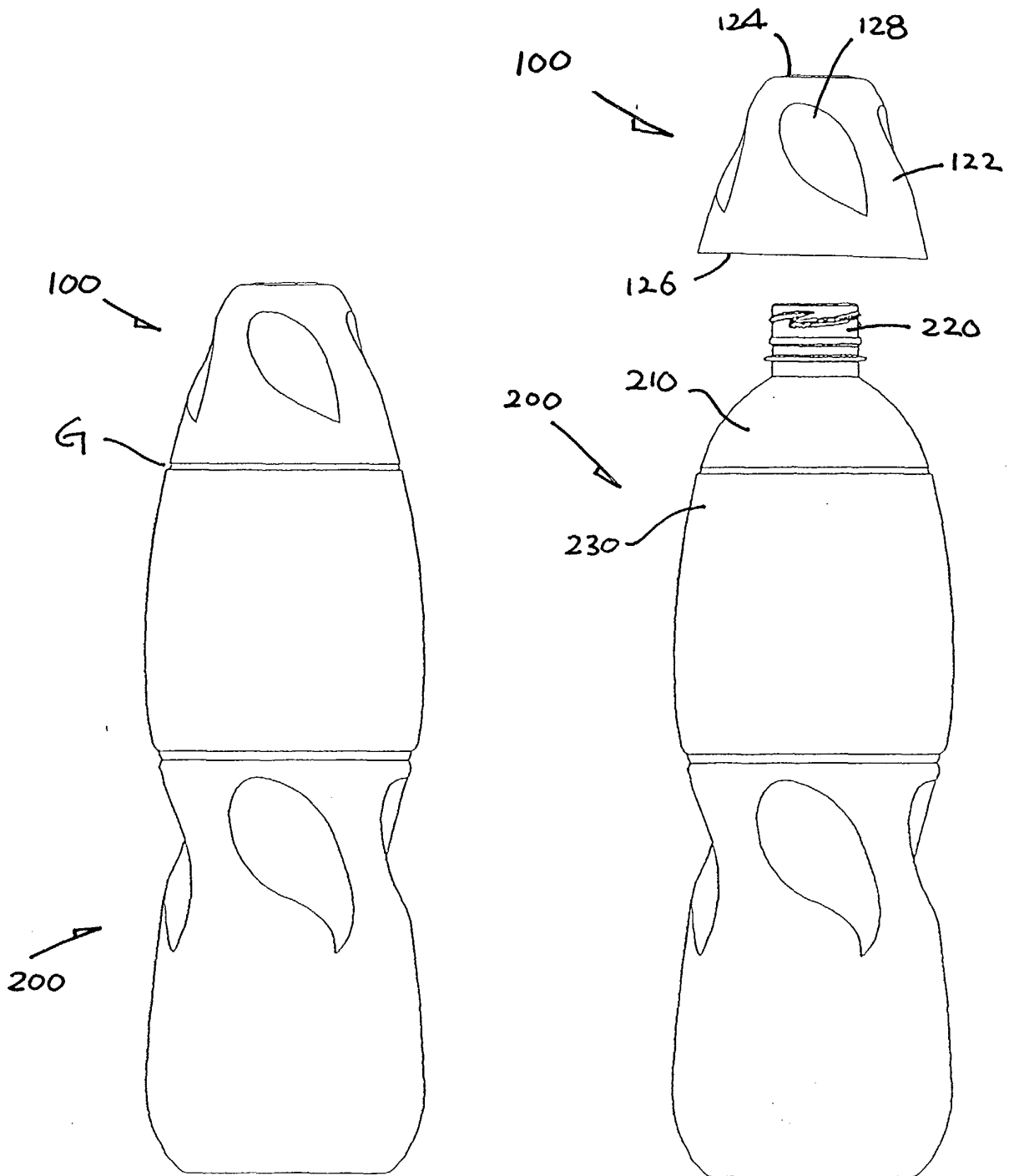


FIG. 2

FIG. 1

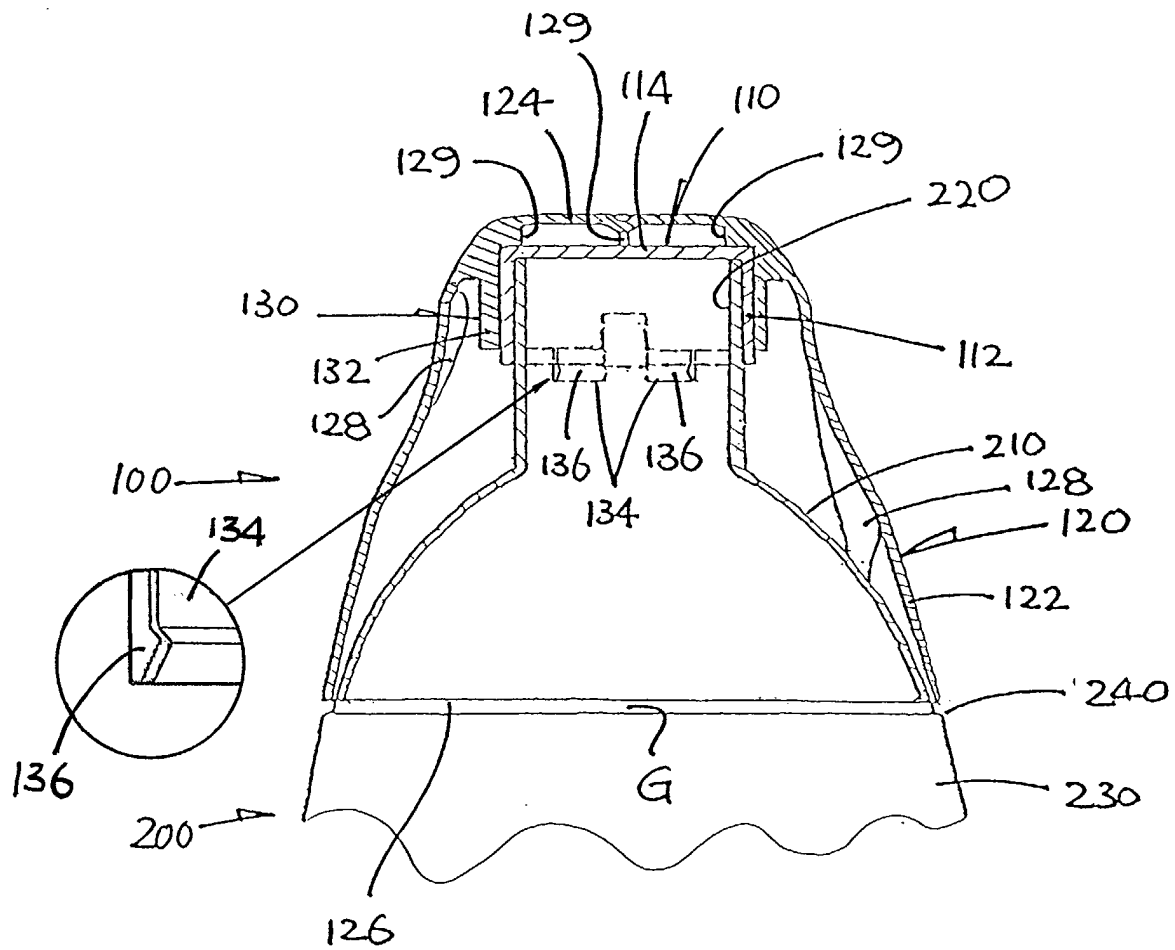


FIG. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 25 4183

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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A	* column 4, line 30 - line 47; figure 1 *		
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A	* page 6, line 13 - page 7, line 1; claim 1; figures 1,3 *		
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The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 10 October 2003	Examiner Seegerer, H
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 25 4183

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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10-10-2003

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