(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 606 935 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **94200017.5**

(51) Int. Cl.[5]: **B65D 83/40**, B65D 50/08

(22) Date of filing: **07.01.94**

(30) Priority: **15.01.93 NL 9300077**

(43) Date of publication of application:
20.07.94 Bulletin 94/29

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE

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(54) A cap for an aerosol can.

(57) The invention relates to a cap for an aerosol can (1) provided with an outer shell (7), which is at one end provided with an upper wall (8) extending perpendicularly to the outer shell (7), on which the upper end of an inner shell (9) surrounded by said outer shell (7) joins. The length of the inner shell (9) is less than the length of the outer shell (7) and the inner shell (9) is provided with a flange (18) on the inside, at its bottom edge remote from the upper wall (8), which flange (18) is designed to engage under a bead (5) forming part of an aerosol can (1). Connecting means (15) are provided between at least two substantially diametrically opposed and resiliently compressible parts of the outer shell (7) and the inner shell (9), which connecting means (15) join on the inner shell (9) in two at least substantially diametrically opposed points. Recesses (16) are provided in the bottom edge of the inner shell (9), near the points of joining of the connecting means (15) on the inner shell (9), in such a manner that the flange (18) provided on the inside of the inner shell (9) is interrupted near the points of joining.

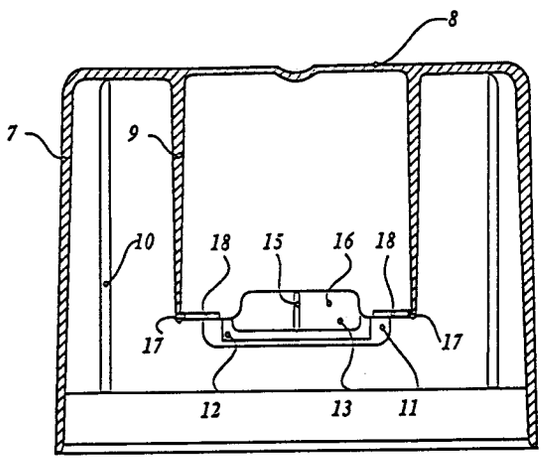

Fig. 3

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The invention relates to a cap for an aerosol can provided with an outer shell, which is at one end provided with an upper wall extending perpendicularly to the outer shell, on which the upper end of an inner shell surrounded by said outer shell joins, the length of the inner shell being less than the length of the outer shell, measured in a direction perpendicularly to the upper wall, and the inner shell being provided with a flange on the inside, at its bottom edge remote from the upper wall, which flange is designed to engage under a bead forming part of an aerosol can, whilst connecting means are provided between at least two substantially diametrically opposed and resiliently compressible parts of the outer shell and the inner shell, said connecting means joining on the inner shell in two at least substantially diametrically opposed points.

With a known cap of the above kind the flange engaging under the bead forming part of the aerosol can extends circumferentially over 360°. In order to be able to detach the cap from the aerosol can it will be necessary to exert forces directed towards the centre of the outer shell on the two resiliently compressible parts of the outer shell, in order to deform the inner wall in such a manner that the flange can be wrested from the bead of the aerosol can.

This known cap, which is designed with a view to obtaining an attachment of the cap to the aerosol can such that it is practically impossible for small children to remove the cap from the aerosol can, is satisfactory per se. The forces which must be exerted thereby on the opposed resilient parts of the outer shell are so great, however, that removing the cap may be difficult, in particular for older people.

The object of the invention is to obtain a cap of the above kind, whereby the requirements of a so-called "child-proof" cap are still met, but whereby slightly less physical effort is be expended in removing it from the can.

According to the invention this may be achieved in that recesses are provided in the bottom edge of the inner shell, near the points of joining of the connecting means on the inner shell, in such a manner that the flange provided on the inside of the inner shell is interrupted near the points of joining. When using the construction according to the invention the flange will only extend over two approximately diametrically opposed parts of the inner shell, therefore, which parts will be moved apart when a compression force is exerted on the resiliently compressible parts of the outer shell. By using the construction according to the invention the object aimed at can thus be achieved in a very simple manner.

The invention will be explained in more detail hereafter with reference to an embodiment of the construction according to the invention illustrated in the accompanying Figures.

Figure 1 is a schematic view of an upper part of a conventional aerosol can.

Figure 2 is an elevational view of a cap according to the invention.

Figure 3 is a cross-sectional view of the cap according to the invention.

Figure 4 is a cross-sectional view of the cap according to the invention, perpendicularly to the cross-sectional view of Figure 3.

Figure 5 is a bottom view of the cap according to the invention.

The cap according to the invention is designed for use in combination with a conventional aerosol can 1. Such an aerosol can comprises a cylindrical shell 2, to which a more or less dome-shaped cover 3 is secured by means of a bead 4. A valve mechanism 6 is attached to the upper end of said dome-shaped cover 3 by means of a bead connection 5. The contents of the aerosol can 1 may be discharged in a usual manner by operating said valve mechanism 6. In order to prevent undesirable use, in particular by children, a cap yet to be described in more detail hereafter, which surrounds the valve mechanism 6, may be placed on the aerosol can 1, the construction of said cap being such that normally it cannot be removed from the aerosol can 1 by children.

As is shown in more detail in Figures 2 - 5 said cap comprises a substantially cylindrical outer shell 7, on the upper end of which an upper wall 8 extending perpendicularly to the central axis of the outer shell joins. The shell 7 surrounds an inner shell 9, which is arranged concentrically with respect to the shell 7 and which joins the upper wall 8 with its upper end. As is apparent from Figures 3 and 4, the length of the inner shell 9, measured from the upper wall 8, is less than the length of the outer shell 7, so that the lowermost part of the outer shell 7 projects from the bottom side of inner shell 9. The outer shell 7 is provided with a plurality of reinforcing ribs 10 on the inside. Furthermore the outer shell 7 includes inwardly staggered wall parts 11 in two radially opposite parts, in which U-shaped slots 12 are formed. As will be apparent in particular from Figure 2, such a U-shaped slot 12 bounds a lip-shaped part 13, which joins on the other part of the wall portion 11 at a point located some distance below the upper wall 8.

As will be apparent from Figure 5, the inner shell 9 as well as the outer shell 7 have a substantially circular section, but near the inwardly staggered wall parts 11 of the outer shell the inner shell 7 is provided with trough-shaped, curved protrusions 14 projecting outwards relative to the other parts of the inner shell and extending in the longitudinal direction of the inner shell. Said protrusions

14 are connected to the centres of the tongues 13 by means of connecting ribs extending radially relative to the central axis of the cap.

As is furthermore apparent in particular from Figures 3 and 4, recesses 16 extending through a circumferential angle of ± 45 - 60° are provided in the lower part of the inner shell, near the protrusions 14 and the connecting means 15 connected to the centres of said protrusions, so that the inner shell 13 is provided with two diametrically opposed strip-shaped parts 17, which project below the other part of the inner shell, said parts 17 at their lower boundary edges being provided with internal projecting flange parts 18, which concentrically surround the central axis of the cap.

When the above-described cap is placed on an aerosol can of the type shown in Figure 1, the flange parts 18 will move slightly outwards under resilient deformation of the inner shell 9 when pushing on the cap, so that said flange parts can snap under the bead 5.

In order to remove the cap a force must be exerted in the direction according to arrow A on the lips 13, which are resiliently movable in inward direction relative to the other part of the outer shell 7. Forces exerted on the lips 13 in the direction according to arrow A will be transmitted to the protrusions 14 of the inner shell 9 via the connecting means 15, as a result of which said diametrically opposed parts 14 of the inner shell will be forced towards each other, which results in a resilient deformation of the inner shell 9 such that the diametrically opposed flanges 18 will move in a direction away from each other. Then the cap can be wrested from the aerosol can.

Due to the described configuration of the inner shell 9 and the diametrically opposed recesses 16 provided therein less force is required for deforming and pulling off the cap from the bead 5 of the aerosol can than with the constructions that have been usual so far.

Claims

1. A cap for an aerosol can provided with an outer shell, which is at one end provided with an upper wall extending perpendicularly to the outer shell, on which the upper end of an inner shell surrounded by said outer shell joins, the length of the inner shell being less than the length of the outer shell, measured in a direction perpendicularly to the upper wall, and the inner shell being provided with a flange on the inside, at its bottom edge remote from the upper wall, which flange is designed to engage under a bead forming part of an aerosol can, whilst connecting means are provided between at least two substantially diametrically opposed and resiliently compressible parts of the outer shell and the inner shell, said connecting means joining on the inner shell in two at least substantially diametrically opposed points, characterized in that recesses are provided in the bottom edge of the inner shell, near the points of joining of the connecting means on the inner shell, in such a manner that the flange provided on the inside of the inner shell is interrupted near the points of joining.

2. A cap according to claim 1, characterized in that a recess in the inner shell extends through a circumferential angle of ± 45 - 60°.

3. A cap according to claim 1 or 2, characterized in that a recess provided in the bottom end of the inner shell is provided near an outward protrusion of the inner shell extending along the height of the inner shell.

4. A cap according to claim 3, characterized in that a protrusion is connected to a resiliently compressible part of the outer shell by means of an at least substantially radially extending connecting rib.

5. A cap according to any one of the preceding claims, characterized in that a resilient part of the outer shell is made up of a U-shaped lip cut out of the outer shell, which is only connected to the other part of the outer shell at one end.

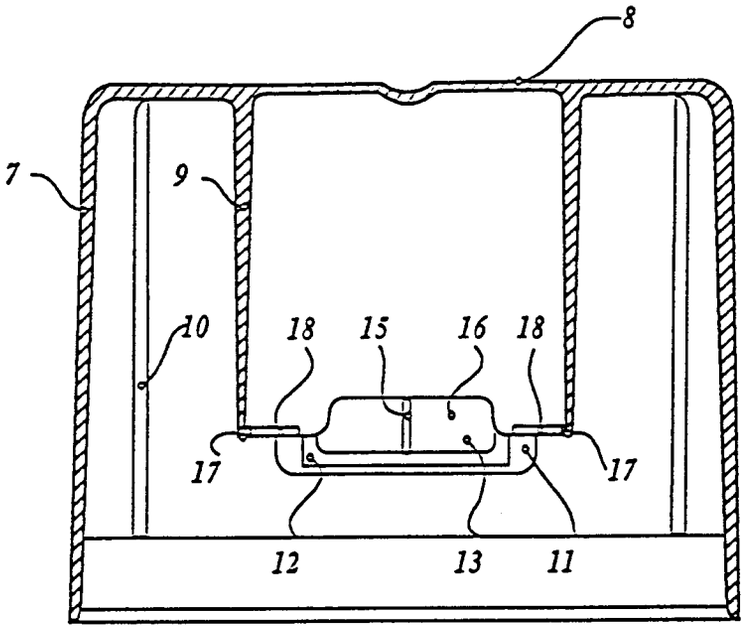

Fig. 3

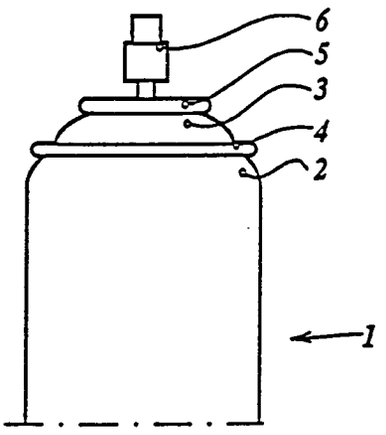

Fig. 1

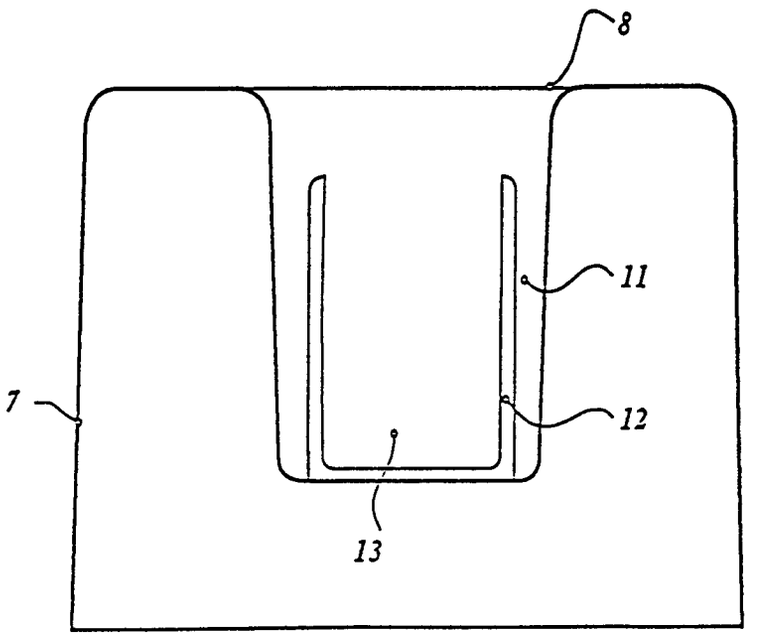

Fig. 2

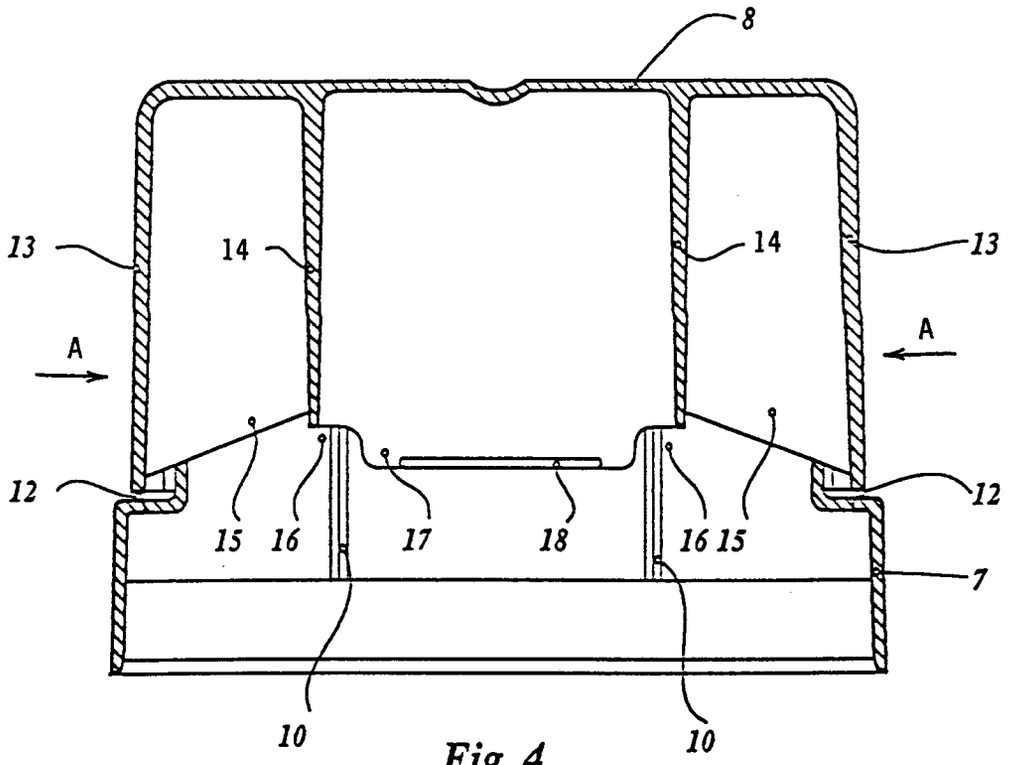
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Fig. 4

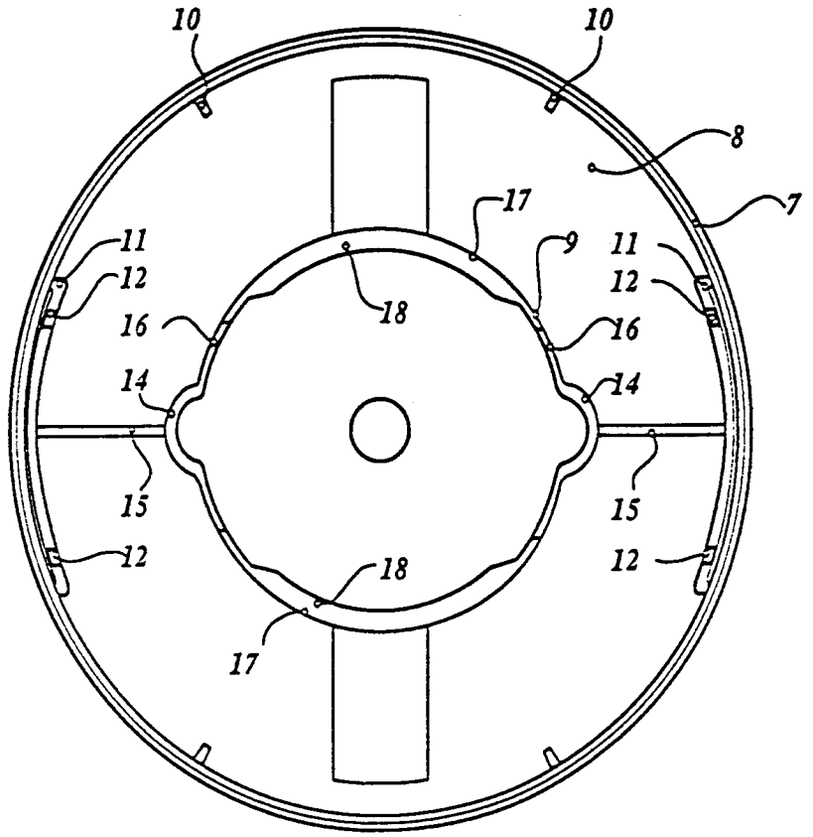
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Fig. 5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 20 0017

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
Y	DE-U-86 05 281 (KUNSTSTOFFWERK EUGEN SAIER) * the whole document *	1	B65D83/40 B65D50/08
Y	US-A-3 802 607 (MEAD) * column 5, line 60 - column 9, line 39; figures 1-4,12,13 *	1	
A	US-A-3 964 634 (JASINSKI) * figures 7-10 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.5)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	5 April 1994	Spettel, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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