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(54) **DIFFUSER**

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(57) **ABSTRACT**

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A diffuser (1) for dispensing a product has a base (10); a push button (20) with a channel (23) opening at one end on an outlet (24) for the product; a cap (30) connected to the base by a hinge (17, 17') so as to be movable between a closed position folded down on the base while isolating the push button (20) and the outlet opening (24) from the outside, and an upright open position, providing access to the push button and freeing the outlet; tamper-evident means (40, 18) made up of a strip (40) and a shoulder (18), one being fastened to the cap (30) and the other to the base (10), so that, with the cap in the closed position, the shoulder is snapped behind an abutment (43) formed in the strip without being able to free itself otherwise than by tearing off the strip.

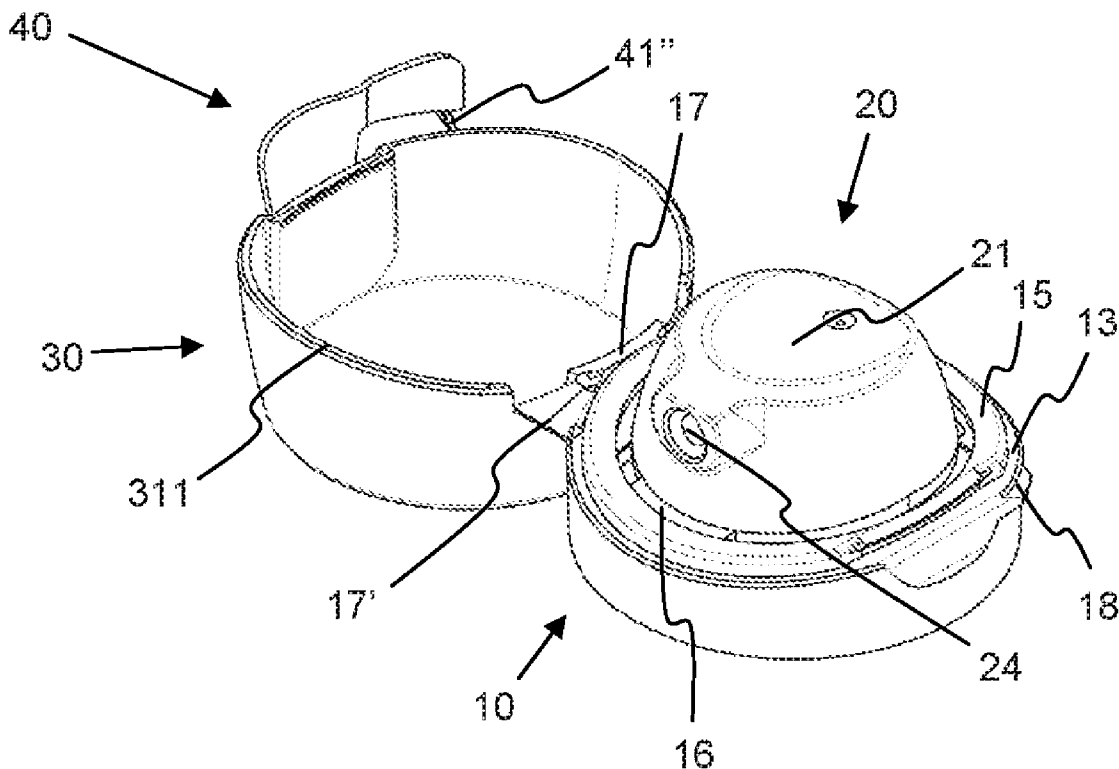
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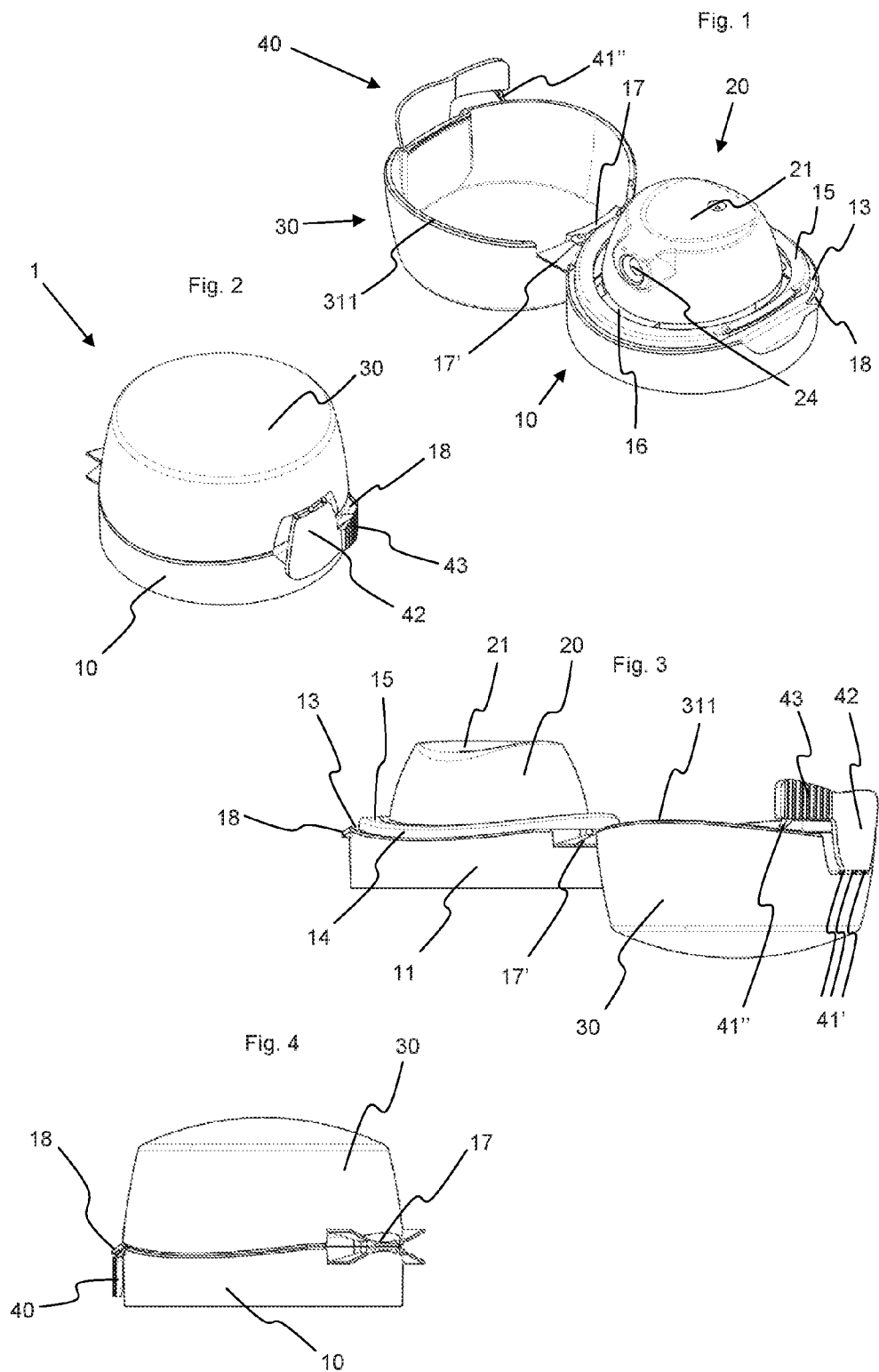
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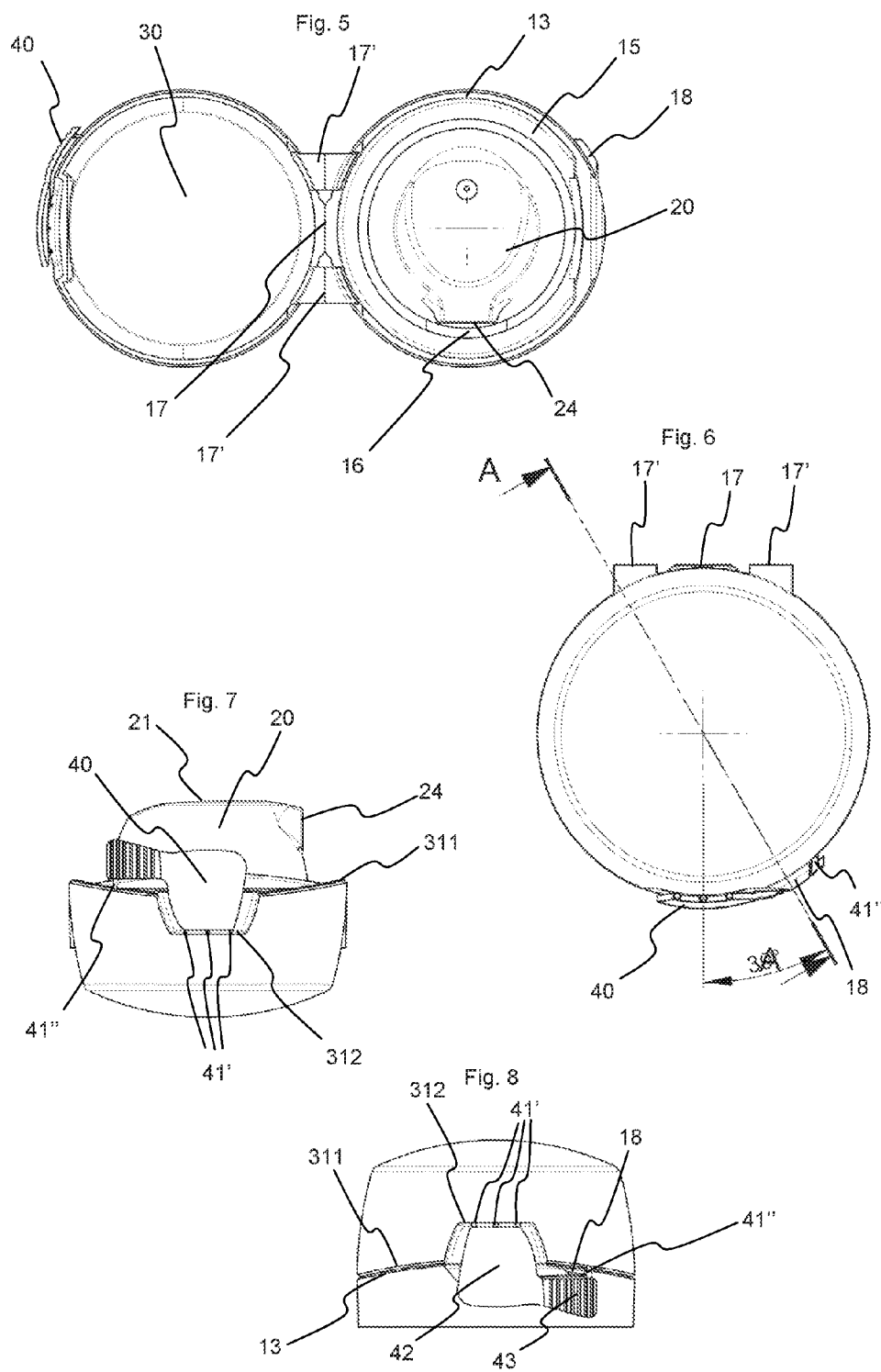


Fig. 9a

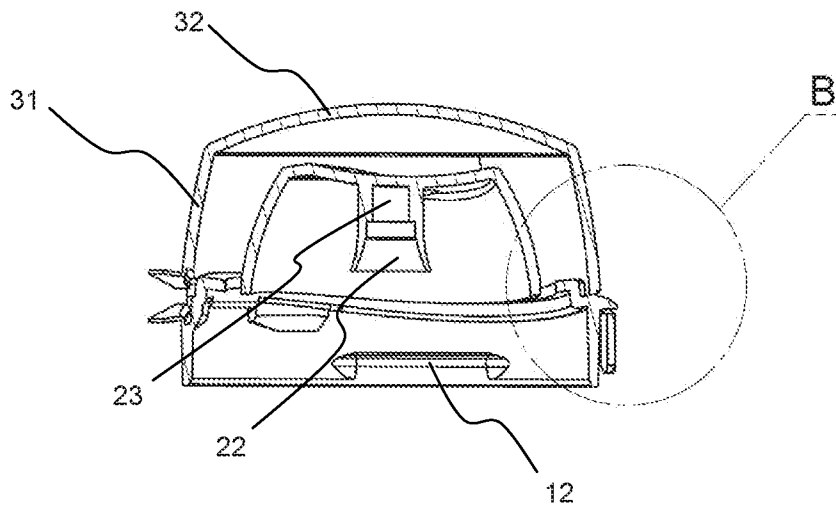
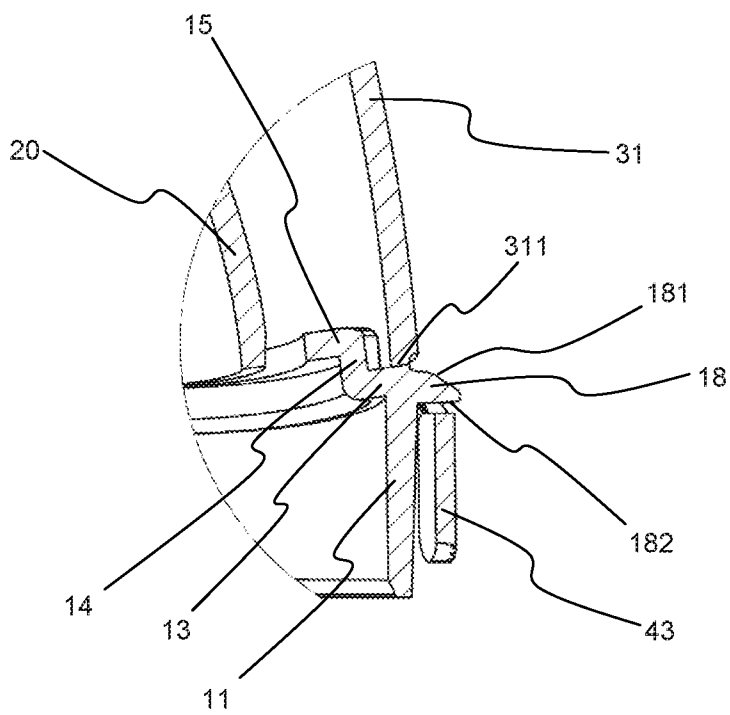


Fig. 9b



DIFFUSER

[0001] The invention relates to a diffuser for dispensing a product contained in a container, wherein the diffuser is equipped with a base for fastening it to a container and a push button equipped with a channel opening at one end on means for cooperating with a dispensing device of a container and at the other end on an outlet opening through which the product contained in a container can exit.

[0002] The diffusers of the preamble find many applications, particularly for aerosol bottles. However, they have the disadvantage that the push button can be actuated unintentionally and that dirt can come to clog the outlet opening.

[0003] This can be avoided by pushing down a removable cap on the diffuser. But this removable cap runs the risk of being lost. In addition, it is important to guarantee the originality of the container before the first use.

[0004] The aim of the invention is to propose diffusers according to the preamble which do not have the disadvantages mentioned above.

[0005] This object is achieved according to the invention in that the diffuser is further equipped with

[0006] a cap connected to the base by a hinge so as to be movable between a closed position in which it is folded down on the base while isolating the push button and the outlet opening from the outside, and an open position in which it is upright, providing access to the push button and freeing the outlet opening,

[0007] tamper-evident means that must be partly torn off upon the first use to make it possible to move the cap from the closed position to the open position,

[0008] the tamper-evident means being constituted by both a strip and a shoulder, one being fastened to the cap and the other to the base, the strip being fastened to the cap or to the base by connection means that can easily be torn by hand, and the shoulder being placed on the base or the cap so that, when the cap is placed in the closed position, the shoulder is snapped behind an abutment formed in the strip without being able to free itself other than by tearing off the strip.

[0009] Thanks to the hinge, the cap is not likely to be misplaced. In addition, by isolating the push button and the outlet opening from the outside when the cap is in the closed position, the diffuser is not likely to be inadvertently actuated and the spray nozzle cannot be soiled before the first use. This diffuser is simple to manufacture. It is sufficient to mold a base having a cap and to provide on one of these parts a strip which can be torn off and on the other part a shoulder that can be locked behind an abutment formed in the strip. At the first closing of the cap, the shoulder snaps behind the abutment formed in the strip without being able to be disengaged therefrom other than by tearing off the strip. The tamper-evident means are an integral part of the diffuser so that it is not necessary to provide an additional step to put them in place.

[0010] The strip is preferably fastened to the cap or to the base by a plurality of bridges extending from the face of an edge of the strip to the cap or to the base. In addition, the face of the edge of the strip between two individual bridges forms the abutment behind which the shoulder is snapped.

[0011] It is particularly advantageous to fasten the strip to the cap and to provide the shoulder in the base. For example the strip can be provided with an L-shape made up of a vertical branch and a transverse branch, and the cap can be equipped with a recess. In this case, the top of the vertical branch can be connected by first bridges to the top, consider-

ing the cap in the closed position, of the recess, and the free end of the transverse branch to the lower portion (311), considering the cap in the closed position, of the cap.

[0012] The shoulder can be wedge-shaped with an inclined surface and a radial surface, the radial surface cooperating with the strip to block the cap in the closed position.

[0013] It is preferable to connect the push button to the base by a tab so that the push button can be moved toward the side of the base opposite the cap when the latter is in the closed position. The outlet opening can be provided with a nozzle for generating a spray.

[0014] The invention is described in more detail using the following figures:

[0015] FIG. 1 is a perspective view of a dispenser according to the invention, with the cap in open position;

[0016] FIG. 2 is the same perspective view as in FIG. 1, with the cap in closed position;

[0017] FIG. 3 is another perspective view of the diffuser of FIG. 1, with the cap in open position;

[0018] FIG. 4 is the same perspective view as in FIG. 3, with the cap in closed position;

[0019] FIG. 5 is a top view of the diffuser of FIG. 1, with the cap in open position;

[0020] FIG. 6 is a top view of the diffuser of FIG. 1, with the cap in closed position;

[0021] FIG. 7 is a left side view of the diffuser of FIG. 1, with the cap in open position;

[0022] FIG. 8 is a right side view of the diffuser of FIG. 1, with the cap in closed position;

[0023] FIG. 9 is a cross-sectional view of the diffuser of FIG. 1, with the cap in closed position, (a) along line AA of FIG. 6 and (b) an enlarged view in the area of the shoulder.

[0024] The diffuser shown in the figures is intended for an aerosol bottle. It is made up principally of a base (10), a push button (20), a cap (30) and a tamper-evident strip (40).

[0025] For reasons of clarity of the description, spatial references are used such as “lower” and “upper” or “high” and “low”, “vertical” and “top”. It should be noted that the diffuser can be manufactured and sold independently of any bottle or container. Accordingly, these references are made relative to the diffuser as it is shown in the figures with the cap in the closed position. This does not preclude the diffuser from being used in the reverse position, that is to say, with the diffuser under the bottle, or in any other position. Furthermore, the diffuser has a certain symmetry so that it has a vertical main axis, marked by a cross in FIGS. 5 and 6, which serves as a reference in particular to describe radial surfaces perpendicular to this main axis.

[0026] The base (10) is constituted, for example, by an essentially cylindrical or frustoconical first wall (11), equipped on its inner face with fasteners (12) constituting means for fastening it to a container, not shown. The first wall (11) ends at its top with a first annular plate (13) oriented towards the center. This plate (13) is continued upwards by an essentially cylindrical or frustoconical second wall (14), which, in turn, ends with a second annular plate (15) oriented towards the center. The push button (20) is connected to the second annular plate (15) via a tab (16). The cap (30) is connected to the base (10) in the area of the first annular plate (13) by a film hinge (17) and in the area of the first cylindrical wall (11) by two butterfly hinges (17'). Those skilled in the art will recognize that the representation of these butterfly hinges (17') in the closed position of the cap is not correct.

[0027] The push button (20) is constituted for example by a dome-shaped part whose top (21) is flattened, or even recessed, to form a bearing surface for the finger. A trigger, for example an end piece (22) forming means for cooperating with the valve of an aerosol container, is placed on the inner face of the dome. These cooperation means are extended by a channel (23) leading to an outlet opening (24) provided with a nozzle.

[0028] The cap (30) is constituted for example by an essentially cylindrical or frustoconical wall (31) closed at its top by a slightly convex top wall (32). It is connected to the base by hinge elements (17, 17') which are fastened to the lower part of the wall (31) of the cap. The cap can move from a closed position in which it is folded down on the base, while isolating the push button (20) and the outlet opening (24) from the outside, and an open position in which it is upright, providing access to the push button and the outlet opening. In the closed position, the face (311) of the edge of the wall (31) of the cap abuts against the first annular plate (13). Preferably, the outer face of the cap, in the closed position, is placed in the extension of the outer face of the cylindrical or frustoconical first portion (11) of the base. In the closed position of the cap, it is not possible to press the push button and the opening is hidden behind the cap. It is not at risk of being soiled. In contrast, in the open position of the cap, it is possible to access the push button to press it. In addition, the opening is freed and the product can be propelled along the axis of the opening in the form of a spray or be collected in the hand, for example in the case of a foam.

[0029] In order to show that the cap (30) has never been opened, the diffuser is provided with tamper-evident means which keep it in the closed position. The cap can go into the open position only after tearing off the tamper-evident means. These tamper-evident means are composed of a strip (40) fastened to the cap (30) by several bridges (41) and a shoulder (18) formed on the base. In the example shown here, the strip has an L-shape having a vertical branch (42) and a transverse branch (43). The cylindrical or frusto-conical wall (31) of the cap has a recess opposite the hinge (17, 17'). Three of the bridges (41') are fastened between the top of the vertical branch (42) of the strip and the upper portion (312) of the recess. A fourth bridge (41'') is fastened between the free end of the upper face of the transverse branch (43) and the portion (311) of the wall (31) of the cap that abuts against the first annular plate (13) of the base.

[0030] The shoulder (18) extends radially outwardly at the junction between the cylindrical or frustoconical first wall (11) and the annular first wall (13) of the base. In the present example, the shoulder (18) projects outwardly beyond the cylindrical or frustoconical wall (11). It has the shape of a wedge whose upper face is an inclined surface (181), while the lower face forms a radial surface (182) perpendicular to the direction of movement of the strip. This is clearly seen in FIG. 9b. This shoulder (18) is arranged so that when the cap (30) is closed, the shoulder is in abutment with its radial face (182) on the upper face of the transverse branch (43) of the strip. Thus, the shoulder is surrounded to the right by the fourth bridge (41'') and to the left by the first of three bridges (41') fastened to the top of the recess (312), as shown in FIG. 8.

[0031] The diffuser is molded in the open position. It is therefore necessary that the cap be capable of being closed once without damaging the strip (40). This is possible due to the wedge shape of the shoulder. During the initial closing of

the cap (30), the strip (40) comes to slide with the lower face of the transverse branch (43) against the inclined surface (181) of the shoulder, while being deformed elastically, until the upper face of the transverse branch (43) of the strip has passed the lower radial face (182) of the shoulder. At this point, the strip reassumes its initial shape and the upper face of the transverse branch (43) of the strip comes to be blocked against the radial surface (182) of the shoulder. To open the cap (30), the strip (40) must be torn off by tearing the bridges (41).

[0032] Once the strip (40) has been torn off, the recess, at the top (312) of which the strip was fastened by means of the three bridges (41'), forms a grip to facilitate opening the cap. It would however be possible to provide a simpler strip, elongate, whose bridges would all be fastened to the portion (311) of the wall (31) of the cap abutting against the first annular plate (13) of the base.

[0033] Rather than snapping the shoulder (18) behind the upper face of the transverse branch (43) of the strip, it would also be possible to provide a hollow in the face of the strip directed towards the inside of the cap. This hollow, like the upper face of the transverse limb of the strip in this example, serves as an abutment for the shoulder (18).

[0034] In the example shown here, the tamper-evident means are placed opposite the hinge (17) relative to the vertical main axis of the diffuser. They could have been positioned differently. Similarly, the axis of the outlet opening (24) is oriented substantially horizontally and perpendicularly to the median vertical plane passing through the hinge (17) and the strip (40). Other orientations of the outlet opening are possible. Similarly, the outlet opening could be positioned differently relative to the hinge and/or the strip (40).

[0035] Furthermore, the strip could be fastened to the base and the shoulder could be formed on the cap.

[0036] Although the figures illustrate a diffuser for an aerosol-type container, the invention can of course be applied to any type of diffuser. For example, the invention can be applied to a bottle equipped with a pump instead of a valve. As cooperating means for actuating the valve, a rod cooperating with a female valve could have been provided, instead of an end piece (22) intended to cooperate with the stem of a male valve.

LIST OF REFERENCES

1 Diffuser

10 Base

- [0037] 11 1st cylindrical/frustoconical wall
- [0038] 12 Fastening means
- [0039] 13 1st annular plate
- [0040] 14 2nd cylindrical/tapered wall
- [0041] 15 2nd annular plate
- [0042] 16 Push button-fastening tab
- [0043] 17 Film hinge
- [0044] 17' Butterfly hinge
- [0045] 18 Shoulder
- [0046] 181 Inclined surface
- [0047] 182 Radial surface

Push button

- [0048] 21 Flattened area
- [0049] 22 Cooperation means
- [0050] 23 Channel
- [0051] 24 Output opening/Nozzle

30 Cap

- [0052] 31 Cylindrical/frustoconical wall
- [0053] 311 Edge face
- [0054] 312 Recess
- [0055] 31 Top wall

40 Strip

- [0056] 41' Bridges
- [0057] 41" Bridges
- [0058] 42 Vertical branch
- [0059] 43 Transverse branch

1. Diffuser for dispensing a product contained in a container, said diffuser being equipped with

- a base to fasten the diffuser to a container;
- a push button equipped with a channel opening at one end on means for cooperating with a dispensing device of a container and at the other end on an opening outlet through which the product contained in a container can exit;

- a cap connected to the base by a hinge so as to be movable between a closed position in which the cap is folded down on the base while isolating the push button and the outlet opening from the outside, and an open position in which the cap is upright, providing access to the push button and freeing the outlet opening,

- tamper-evident means that must be partially torn off upon the first use to make it possible to move the cap from the closed position to the open position, the tamper-evident means being made up of both a strip and a shoulder, one being fastened to the cap and the other to the base, the strip being fastened to the cap or to the base by connecting means which can easily be torn by hand, and the shoulder being placed on the base or the cap so that when the cap is placed in the closed position, the shoulder is snapped behind an abutment formed in the strip without being able to free itself except by tearing off the strip.

2. The diffuser according to claim 1, wherein the strip is fastened to the cap or to the base by a plurality of bridges extending from a face of an edge of the strip to the cap or to the base, wherein the face of the edge of the strip between two particular bridges forms the abutment behind which the shoulder is snapped.

3. The diffuser according to claim 1, wherein the strip is fastened to the cap and the shoulder is formed in the base.

4. The diffuser according to claim 3, wherein the strip has an L-shape constituted by a vertical branch and a transverse branch, and in that the cap is equipped with a recess, the top of the vertical branch being connected by first bridges to the top, considering the cap in the closed position, of the recess, and the free end of the transverse branch being connected to the lower portion, considering the cap in the closed position, of the cap.

5. The diffuser according to claim 1, wherein the shoulder is wedge-shaped with an inclined surface and a radial surface, the radial surface cooperating with the strip to block the cap in the closed position.

6. The diffuser according to claim 1, wherein the push button is connected to the base by a tab so as to be movable toward a side of the base opposite the cap when the cap is in the closed position.

7. The diffuser according to claim 1, wherein the outlet opening is provided with a nozzle for generating a spray.

8. The diffuser according to claim 2, wherein the strip is fastened to the cap and the shoulder is formed in the base.

9. The diffuser according to claim 8, wherein the strip has an L-shape constituted by a vertical branch and a transverse branch, and in that the cap is equipped with a recess, the top of the vertical branch being connected by first bridges to the top, considering the cap in the closed position, of the recess, and the free end of the transverse branch being connected to the lower portion, considering the cap in the closed position, of the cap.

10. The diffuser according to claim 2, wherein the shoulder is wedge-shaped with an inclined surface and a radial surface, the radial surface cooperating with the strip to block the cap in the closed position.

11. The diffuser according to claim 3, wherein the shoulder is wedge-shaped with an inclined surface and a radial surface, the radial surface cooperating with the strip to block the cap in the closed position.

12. The diffuser according to claim 4, wherein the shoulder is wedge-shaped with an inclined surface and a radial surface, the radial surface cooperating with the strip to block the cap in the closed position.

13. The diffuser according to claim 8, wherein the shoulder is wedge-shaped with an inclined surface and a radial surface, the radial surface cooperating with the strip to block the cap in the closed position.

14. The diffuser according to claim 9, wherein the shoulder is wedge-shaped with an inclined surface and a radial surface, the radial surface cooperating with the strip to block the cap in the closed position.

15. The diffuser according to claim 2, wherein the push button is connected to the base by a tab so as to be movable toward a side of the base opposite the cap when the cap is in the closed position.

16. The diffuser according to claim 3, wherein the push button is connected to the base by a tab so as to be movable toward a side of the base opposite the cap when the cap is in the closed position.

17. The diffuser according to claim 4, wherein the push button is connected to the base by a tab so as to be movable toward a side of the base opposite the cap when the cap is in the closed position.

18. The diffuser according to claim 5, wherein the push button is connected to the base by a tab so as to be movable toward a side of the base opposite the cap when the cap is in the closed position.

19. The diffuser according to claim 2, wherein the outlet opening is provided with a nozzle for generating a spray.

20. The diffuser according to claim 3, wherein the outlet opening is provided with a nozzle for generating a spray.

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