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(54) **FLIP-TOP CAP WITH WARRANTY SEAL FOR POUCHES**

Publication Classification

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(57) **ABSTRACT**

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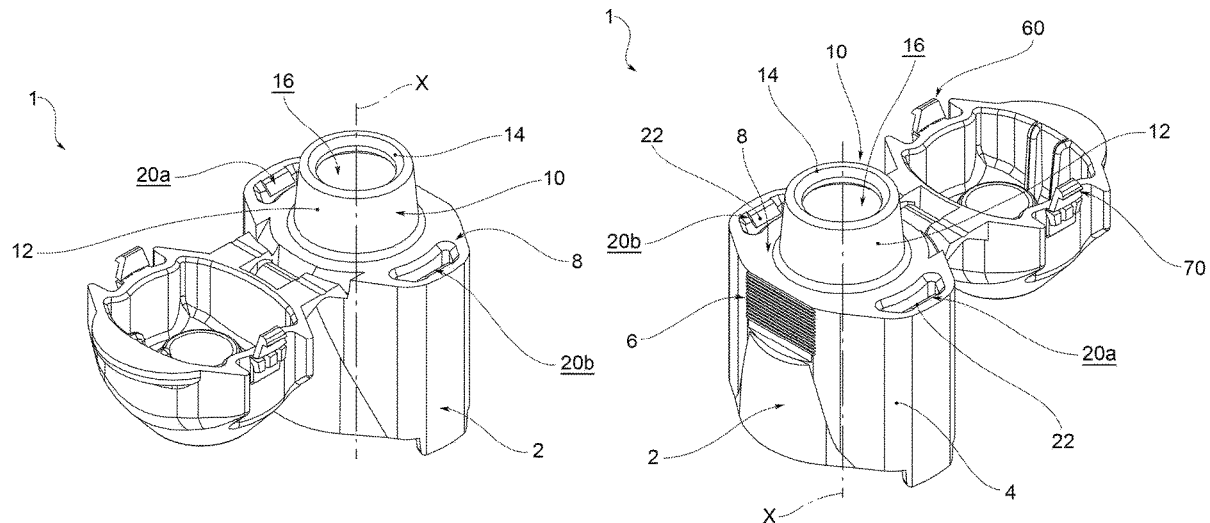
A flip-top cap for pouches includes a skirt, a tube, a main surface, at least one warranty window on the main surface, equipped with hooking elements, a closure hinged to the skirt, and at least one warranty hook attached to the closure by at least one breakable element. In a closed configuration of the cap, the warranty hook is inserted through the warranty window and, to pass into an open configuration, the warranty hook engages with coupling elements and the breakable element and encounters breakage due to a resistance exerted by the coupling elements.

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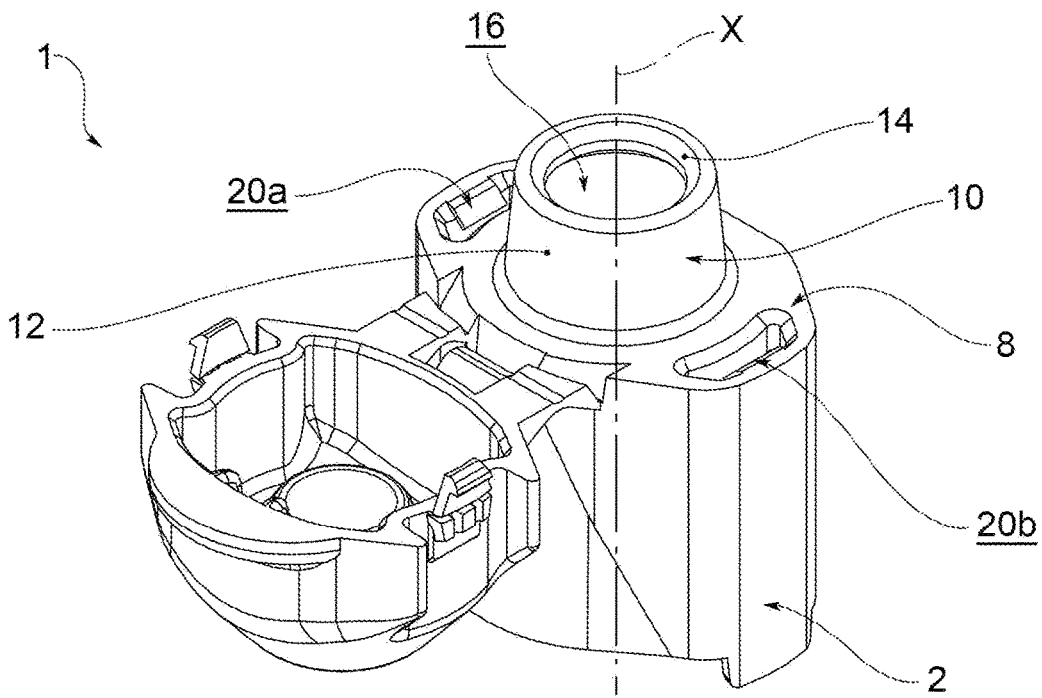


FIG. 1a

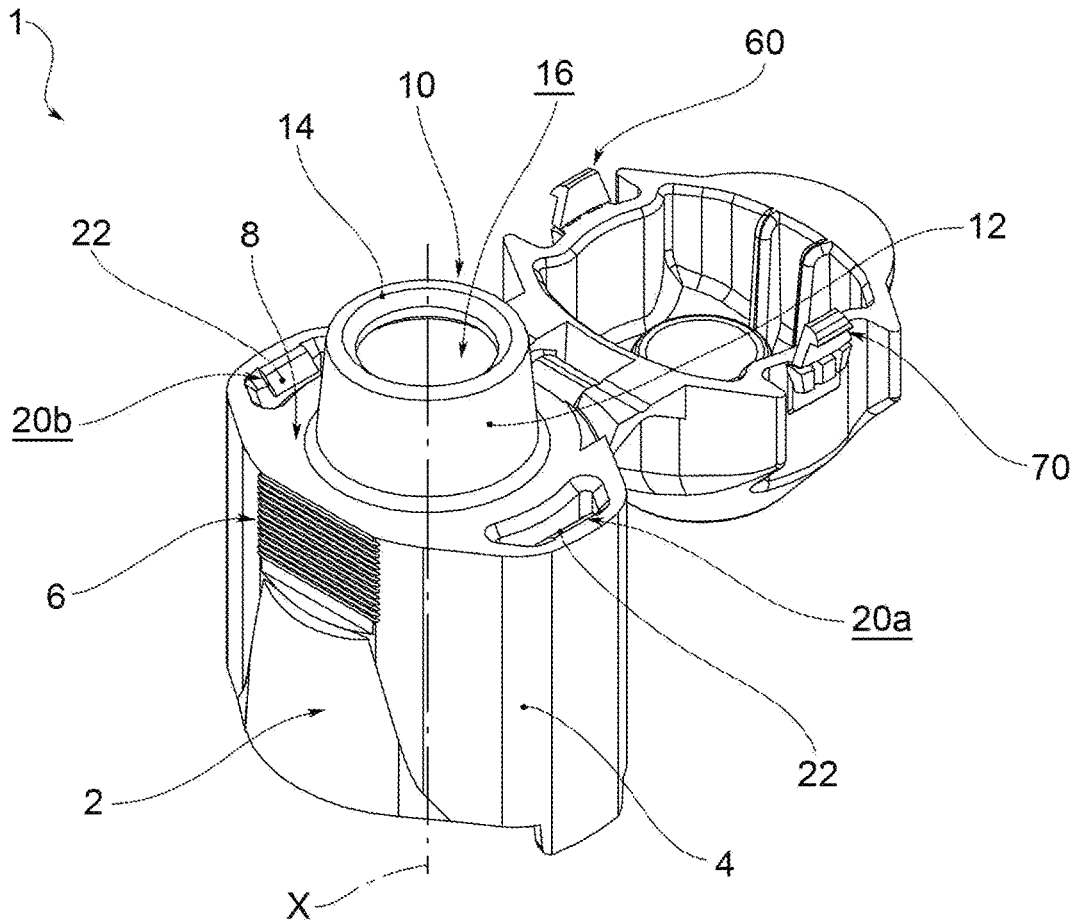


FIG. 1b

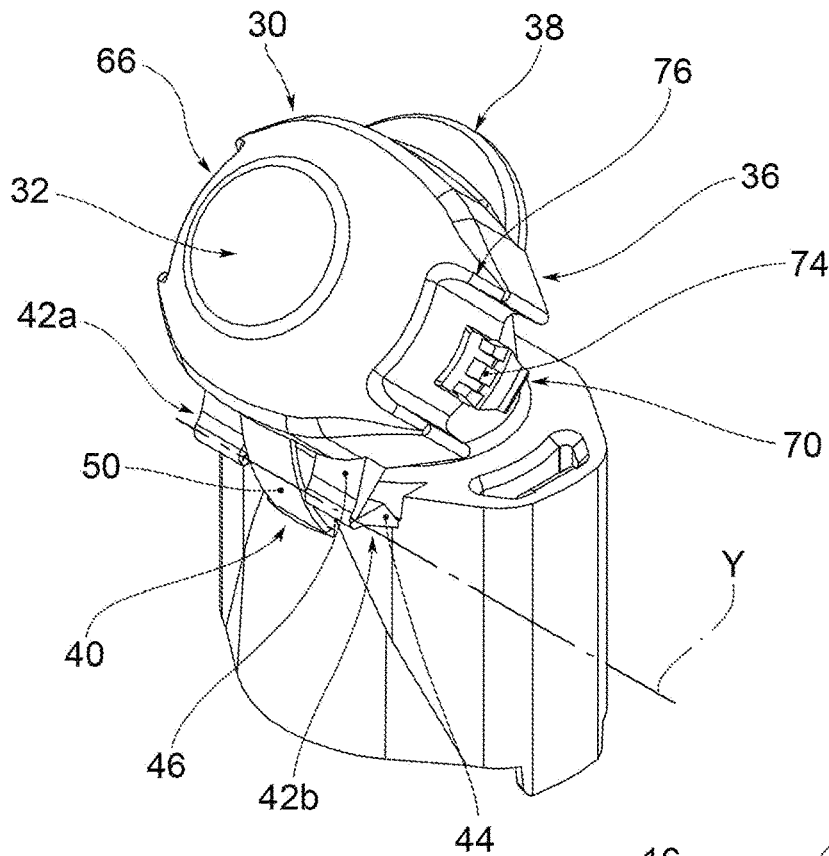


FIG. 2a

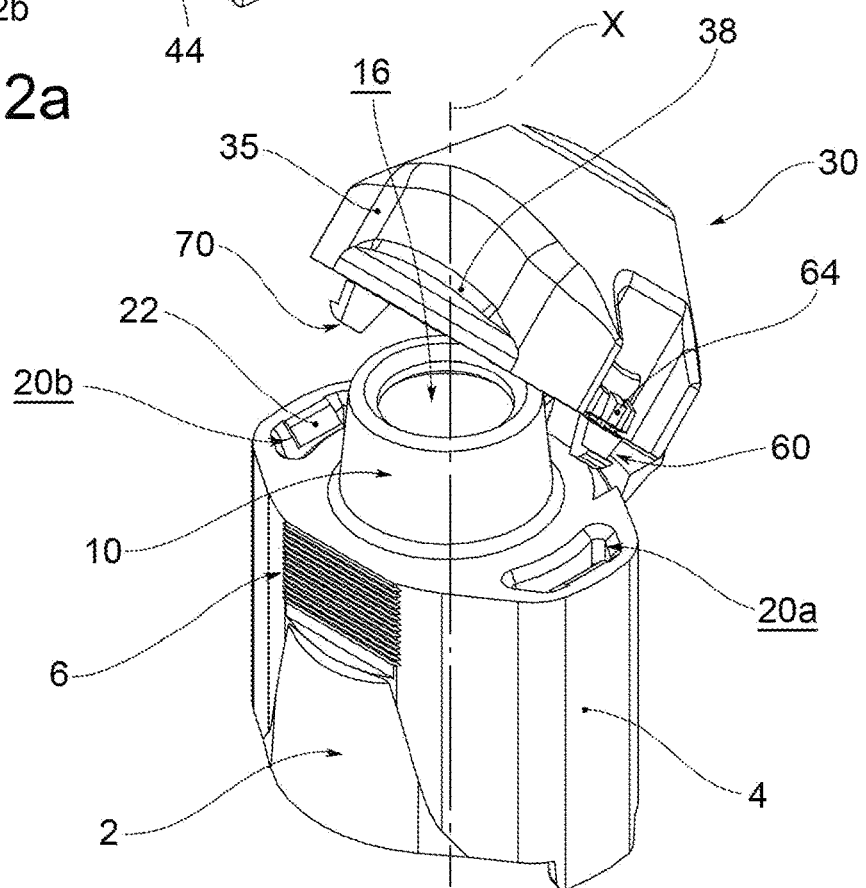


FIG. 2b

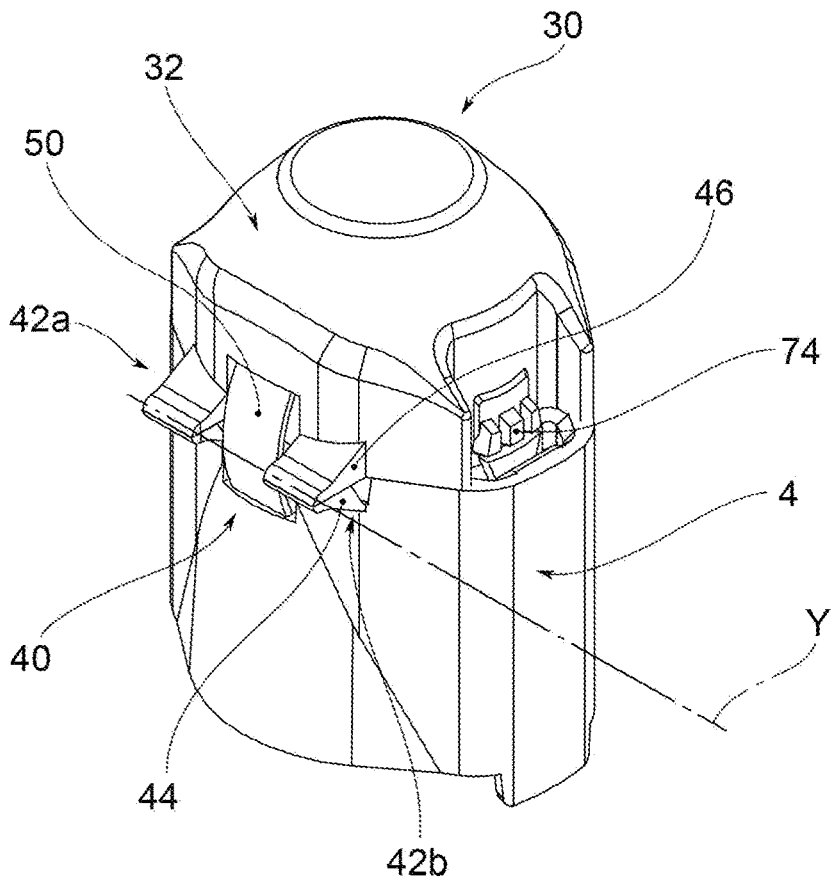


FIG. 3a

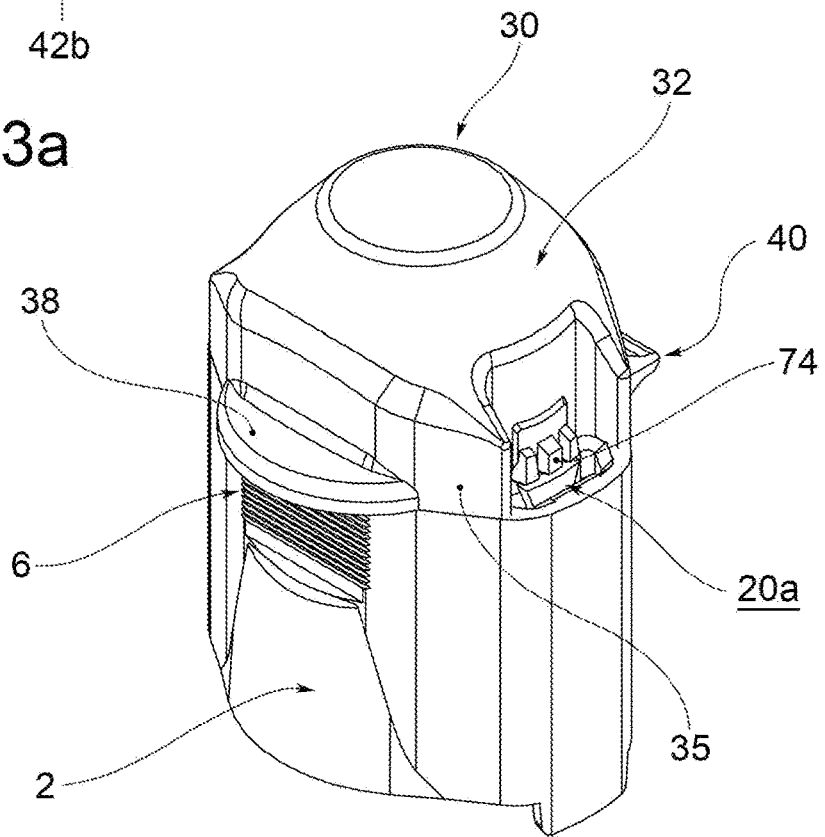


FIG. 3b

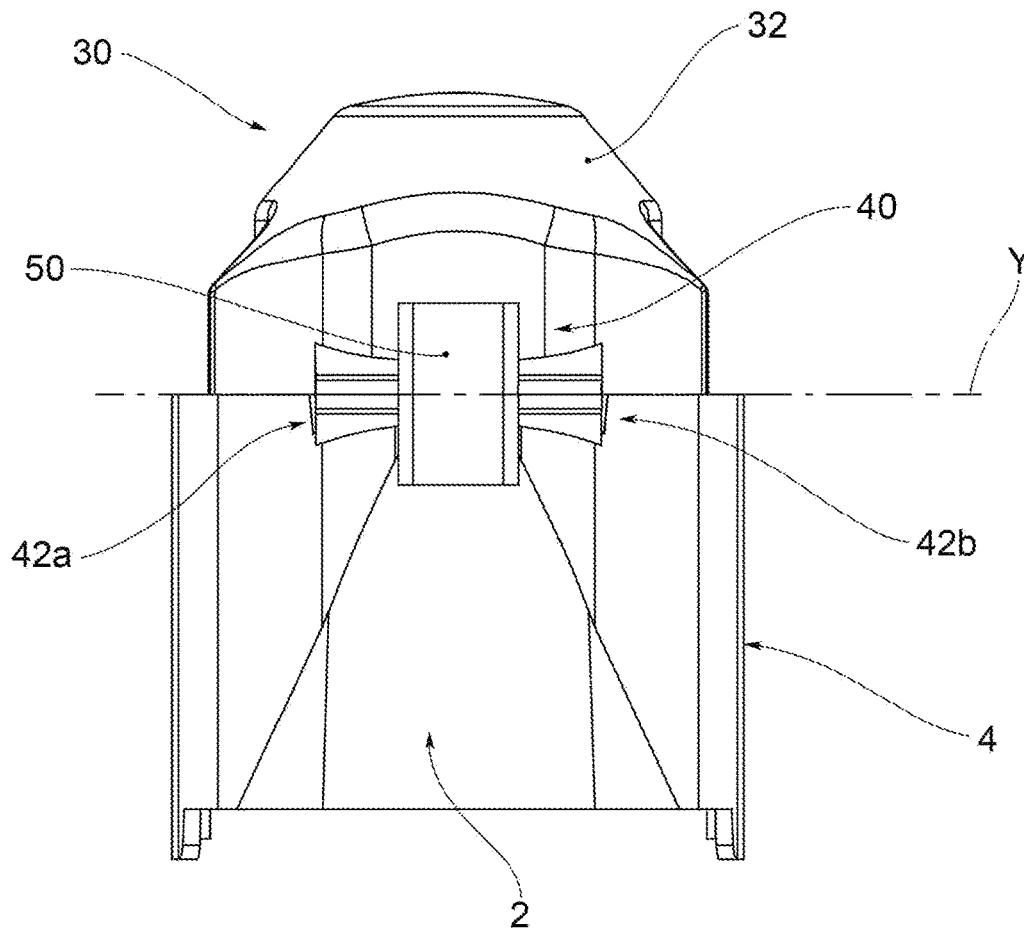


FIG. 5

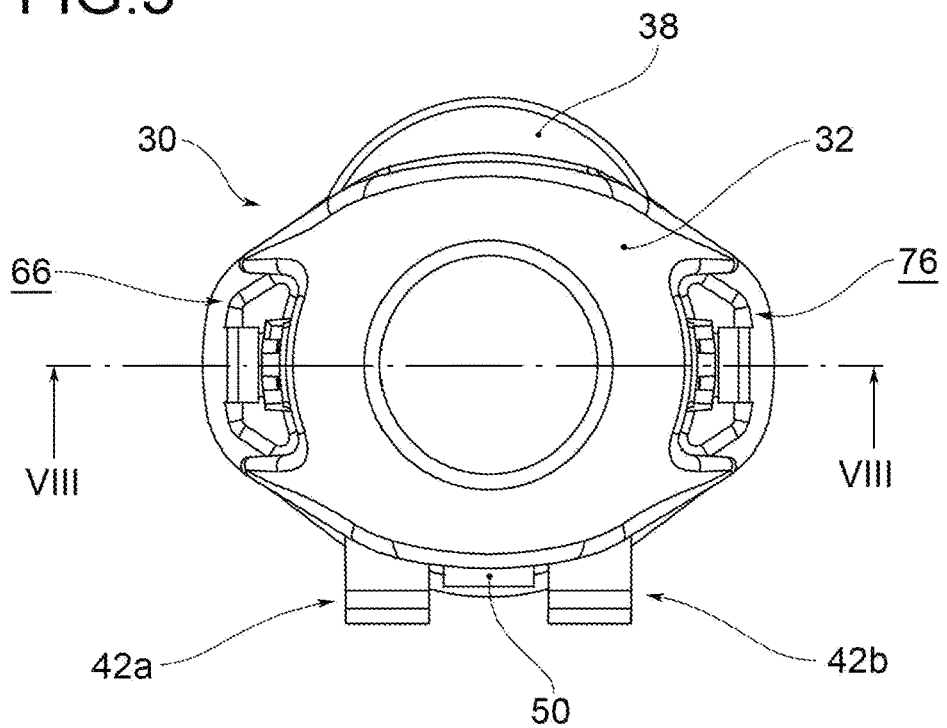


FIG. 4

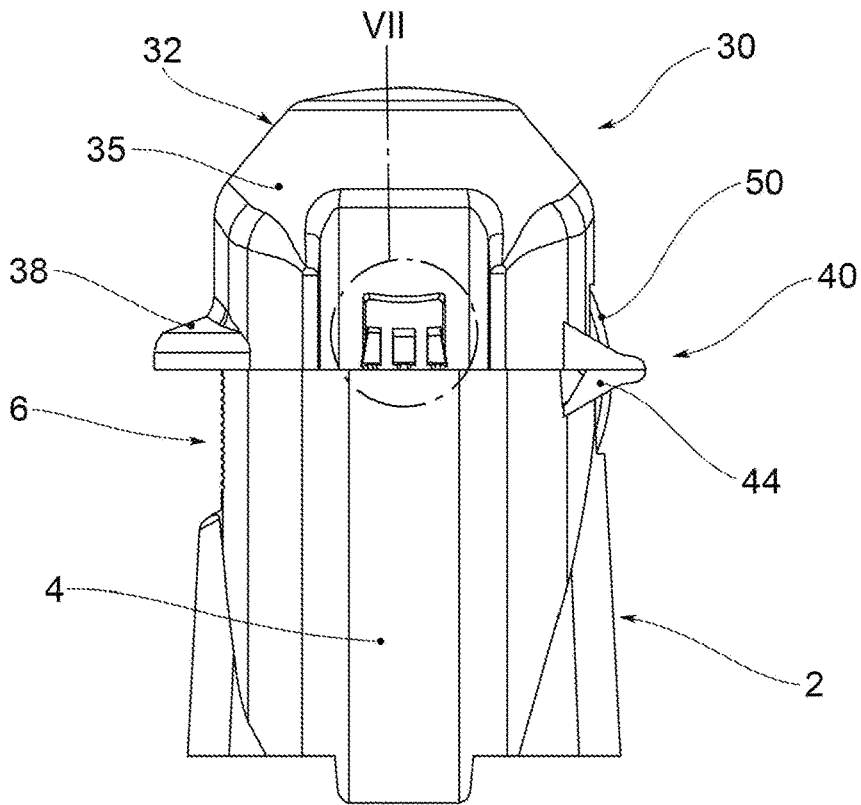


FIG. 6

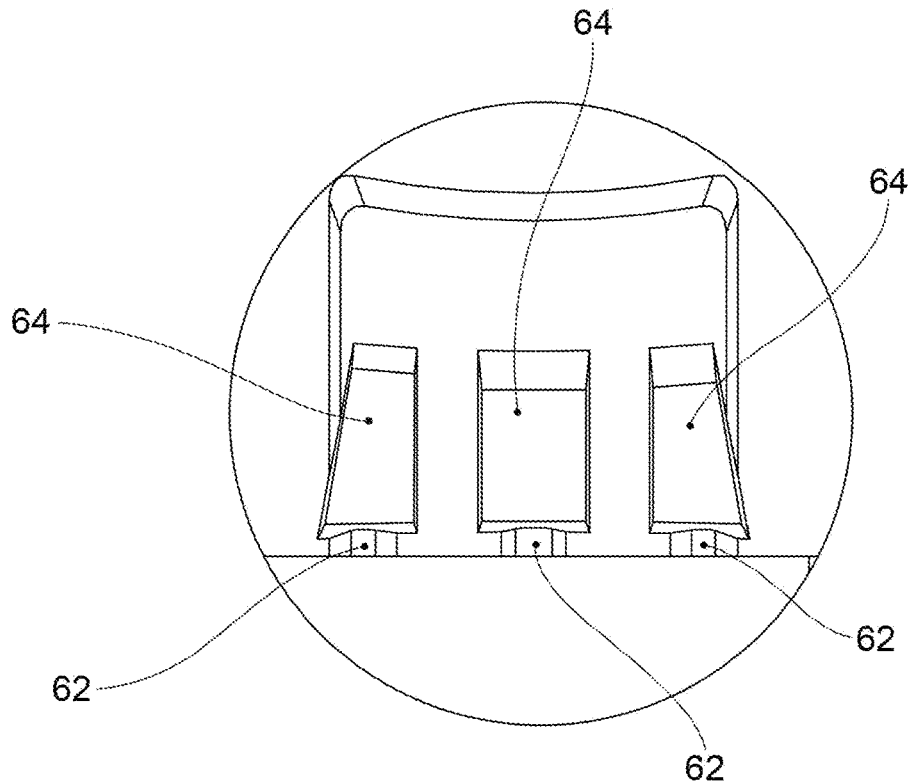


FIG. 7

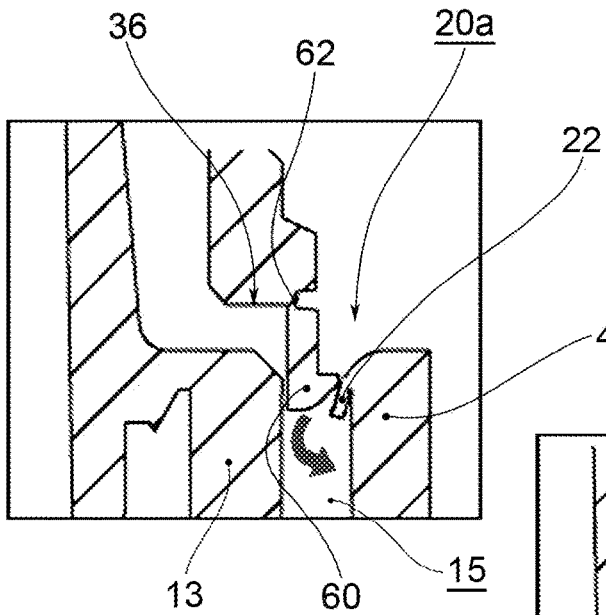


FIG. 11a

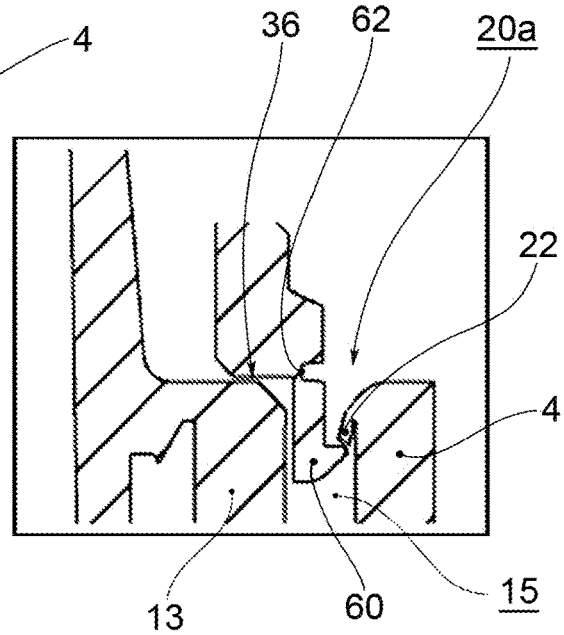


FIG. 11b

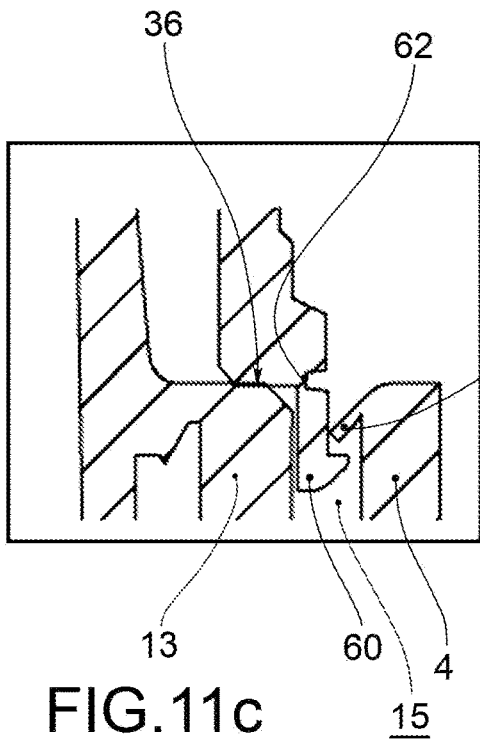


FIG. 11c

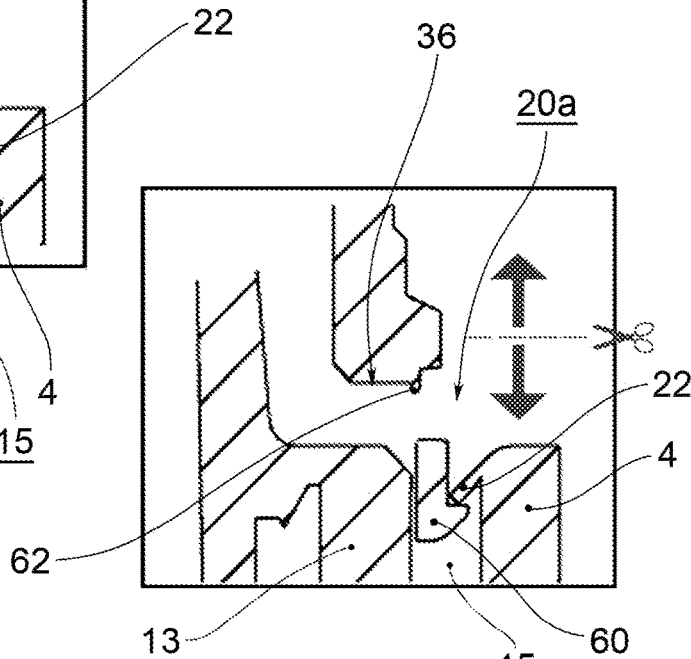


FIG. 11d

FLIP-TOP CAP WITH WARRANTY SEAL FOR POUCHES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is the 35 U.S.C. § 371 national stage application of PCT application PCT/M2018/060194, filed Dec. 17, 2018, where the PCT claims the priority to and benefit of Italian Patent Application No. 102018000001718, filed Jan. 24, 2018 both of which are herein incorporated by reference in their entireties.

FILED OF THE INVENTION

[0002] The present invention relates to the field of plastic caps and, in particular, to “flip top” caps, which may be easily opened, for example, with a movement of the thumb.

[0003] In particular, the present invention provides for the application of a flip-top cap to the spout of a flexible thin-walled bag, usually called a “pouch”.

BACKGROUND OF THE INVENTION

[0004] Even for such pouches, there is a need to make tampering or the first opening of the cap visible, through the use of a warranty seal, usually called a “tamper-evident seal”.

[0005] For this type of cap, however, known warranty seals have some drawbacks, as they very often make opening particularly difficult.

SUMMARY OF THE INVENTION

[0006] The object of the present invention is to create a flip-top cap that overcomes the above-mentioned drawbacks and at the same time satisfies the requirements of the sector.

[0007] Such object is achieved by a flip-top cap as described and claimed herein. Advantageous embodiments of the invention are also described.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The features and advantages of the flip-top cap according to the present invention will be apparent from the description given below, provided by way of non-limiting example, in accordance with the accompanying figures, wherein:

[0009] FIGS. 1a and 1b show a flip-top cap according to an embodiment of the present invention, in a fully open configuration;

[0010] FIGS. 2a and 2b represent the flip-top cap of FIGS. 1a and 1b, in a partially open configuration;

[0011] FIGS. 3a and 3b show the flip-top cap of FIGS. 1a and 1b in a closed configuration;

[0012] FIG. 4 shows a plan view of the flip-top cap of FIGS. 1a and 1b;

[0013] FIG. 5 shows a first side view of the flip-top cap of FIG. 4 (hinge side);

[0014] FIG. 6 represents a second side view of the flip-top cap of FIG. 4 (warranty hook side);

[0015] FIG. 7 shows an enlargement of the detail VII of FIG. 6;

[0016] FIG. 8 shows a section of the flip-top cap, according to the sectional plane VIII-VIII of FIG. 4;

[0017] FIG. 9 shows an enlargement of the detail IX of FIG. 8;

[0018] FIG. 10 represents the flip-top cap in an initial configuration of first closure;

[0019] FIGS. 11a to 11d schematically show a succession of steps from the first closure to the first opening of the flip-top cap according to the present invention.

DETAILED DESCRIPTION

[0020] With reference to the accompanying figures, a flip-top cap suitable to be applied to a spout of a thin-walled flexible bag, known as a “pouch”, is indicated collectively at 1.

[0021] Preferably, the flip-top cap 1 comprises a skirt 2, consisting of a tubular skirt wall 4.

[0022] In a predefined angular position, said skirt 2 has an underlying region 6, for example rectangular, preferably provided with a succession of straight ridges, so that touching with the thumb indicates the correct position for opening.

[0023] The flip-top cap 1 further comprises a flat main reference surface 8, typically placed at the top of the skirt 2, and a tube 10 protruding from said main surface 8 along a main axis X. The main surface 8 lies on an imaginary plane orthogonal to the main axis X.

[0024] The main surface 8 may have a rhomboidal shape, that is, wider in the central portion where the tube 10 is placed and tapered laterally to the tube towards rounded vertices. Correspondingly, the skirt 2 also has a rhomboidal cross-section that resembles the shape of the main surface.

[0025] The tube 10 comprises a tubular tube wall 12, for example frustoconical, ending with a tube edge 14, typically circular, which delimits the mouth 16 of said tube 10.

[0026] Preferably, the flip-top cap 1 further comprises a tube extension 11, which extends axially below the main surface 8, as an extension of said tube 10, inside the skirt wall 4.

[0027] The flip-top cap 1 further comprises a tubular connection portion 13, having an axial extension, arranged inside the tubular skirt wall 4 and radially spaced therefrom; the tubular connection portion 13 is internally threaded and is continuously connected to the tube 10.

[0028] A gap 15 is therefore created between the tubular connection portion 13 and the tubular skirt wall 4, which, when the cap is applied to the spout, is closed at the bottom by a portion of the spout.

[0029] By means of the tubular connection portion 13, the flip-top cap 1 may be screwed to the spout of the flexible pouch to create a fluidic continuity between the spout and the tube 10.

[0030] According to an alternative embodiment, the tube is threaded internally and may be screwed to the spout of the flexible pouch.

[0031] The flip-top cap 1 further comprises at least one warranty window 20a, 20b on the main surface 8, through or blind, arranged in a predefined angular position around the tube 10.

[0032] According to the illustrated embodiment, the flip-top cap 1 has a first warranty window 20a and a second warranty window 20b, arranged diametrically opposite relative to the tube 10.

[0033] The warranty windows 20a, 20b are flanked by the tube 10, each in its respective tapered portion of the main tapered surface 8.

[0034] Each warranty window **20a**, **20b** comprises a warranty tab **22** suitable for making a coupling for a corresponding warranty hook, which will be described hereinafter.

[0035] In other words, the warranty tab **22** is an example of embodiment of coupling elements suitable for making a coupling for a warranty hook.

[0036] For such purpose, said warranty tab **22** comprises a tab wall **24** protruding from the edge of the warranty window **20a**, **20b**, inclined towards the inside of the warranty window **20a**, **20b**, so as to form a guide for entrance of said warranty hook and a hook that opposes escape of the warranty hook.

[0037] The flip-top cap **1** further comprises a closure **30** to close the mouth **16** of the tube **10**.

[0038] The closure **30** comprises a cover **32** suitable to overlap the tube **10**, inside of which there is arranged a tubular tang **34** suitable to penetrate in the tube **10** through the mouth **16**, so as to close it tightly.

[0039] When the closure **30** closes the tube **10**, the tang **34** is coaxial with the tube **10** along the main axis X.

[0040] The cover **32** comprises a cover wall **35** having at its base an annular cover edge **36**, having, for example, a shape corresponding to that of the main surface **8**. When the closure **30** closes the tube **10**, the cover edge **36** rests on the main surface **8**.

[0041] Preferably, said closure **30** comprises an opening ridge **38**, protruding externally from the cover **32**, in a predefined angular position of the cover edge **36**.

[0042] When the closure **30** closes the tube **10**, the opening ridge **38** overlaps the underlying region **6** of the skirt **2**.

[0043] The flip-top cap **1** further comprises a hinge **40** for hinging the closure **30** with the skirt **2**.

[0044] Said hinge **40** comprises at least one shank **42a**, **42b** that joins the skirt **2** to the cover **32**.

[0045] Said shank **42a**, **42b** preferably has two parts: a first shank part **44** joined to the skirt **2** and a second shank part **46** joined to the cover **32**; said parts are joined together so as to form a bendable knee.

[0046] For example, in the illustrated embodiment, a first shank **42a** and a second shank **42b**, spaced apart from each other, are arranged in the rear area of the flip-top cap **1**, i.e. on the side opposite to the opening ridge **38**.

[0047] Preferably, the flip-top cap **1** further comprises elastic elements adapted to bring the closure **30** towards a closed configuration.

[0048] Said elastic elements comprise a sheet **50**, preferably placed between the first and second shanks **42a**, **42b** of the hinge **40**, which is elastically deformable and connected to the skirt **2** and the cover **32**, so as to push the closure **30** towards the closed configuration.

[0049] Said elastic elements, according to a preferred embodiment, are also suitable to bring the closure **30** into a fully open configuration when said closure **30** is beyond an angular limit closing position.

[0050] In other words, when the closure **30** is moved beyond the angular closing limit position, said sheet **50** automatically bends backwards, bringing the closure **30** into the fully open configuration.

[0051] Preferably, said angular limit closing position corresponds to an inclination of 45° of the closure with respect to the main surface **8**.

[0052] The flip-top cap **1** further comprises at least one warranty hook **60**, **70** joined, in an unopened cap configura-

tion, to the cover **32** of the closure **30**, and in particular protruding from the cover edge **36**.

[0053] The warranty hook **60**, **70** is joined to the cover **32** by breakable elements **62**, **72**, for example in the form of very thin feet, which join the warranty hook **60**, **70** to the cover edge **36** or to blocks **64**, **74** joined to the cover **32**.

[0054] In the illustrated embodiment, a first warranty hook **60** and a second warranty hook **70**, arranged diametrically opposed, are provided.

[0055] Each warranty hook **60**, **70** is joined to the cover **32** by means of three breakable elements **62**, **72**, protruding from three blocks **64**, **74** joined to the cover **32** at the cover edge **36**.

[0056] Preferably, said blocks **64**, **74** are accommodated in a respective loop **66**, **76** formed by the cover wall **35** of the cover **32**.

[0057] For example, in the embodiment illustrated, the cover wall **35** is shaped so as to form a first loop **66**, which accommodates the first warranty hook **60**, and a second loop **76**, which accommodates the second warranty hook **70**; said loops **66**, **76** are diametrically opposed, for example, obtained at the tapered portions of the main rhomboidal surface **8**.

[0058] The warranty hook **60**, **70** is suitable to pass through the respective warranty window **20a**, **20b** and to snap into place with the respective warranty tab **22**.

[0059] The flip-top cap **1** is made of a single piece of plastic material, by means of injection molding, in the completely open initial configuration.

[0060] Once the pouch is filled, the cap is applied to the pouch; alternatively, the cap is first closed and then applied to the pouch.

[0061] During the first closure of the cap (FIG. **11a**), the warranty hook **60**, **70** passes through the respective warranty window **20a**, **20b**, the insertion thereof being made easier by the shape of the warranty tab **22**.

[0062] The warranty tab **22** is flexible and bends by the action of the warranty hook **60**, **70** (FIG. **11b**), until the warranty hook **60**, **70** has penetrated sufficiently to release the warranty tab **22** (FIG. **11c**).

[0063] The warranty tab **22** thus returns to its original shape and forms a coupling able to engage the warranty hook **60**, **70**.

[0064] When the cap is first opened (FIG. **11d**), the warranty hook **60**, **70** tries to exit through the warranty window **20a**, **20b**, but the warranty tab **22** constitutes an obstacle.

[0065] A suitable action on the closure **30** causes further rotation of the flip-top cap **1**, until the continuity between the warranty hook **60**, **70** and the cover **32** breaks, due, for example, to breakage of the breakable elements **62**, **72**.

[0066] In other words, while the closure **30** moves into the opening configuration, the breakable elements **62**, **72** break, and the warranty hook **60**, **70** remains engaged with the warranty tab **22**.

[0067] The opening of the cap remains very evident to any user.

[0068] In particular, the warranty hook **60**, **70** remains confined in the gap **15** formed between the tubular connection portion **13** and the tubular skirt wall **4** and, being detached from the cover **32** that supported it, tends to fall by gravity along said gap **15**, which is closed at the bottom by the spout portion. On the other hand, at the top the warranty

flap **22** acts as an obstacle preventing the warranty hook **60**, **70** from escaping through the warranty window **20a**, **20b**.

[0069] Innovatively, the flip-top cap according to the present invention overcomes the drawbacks mentioned with reference to the known art. In particular, the warranty seal allows tampering or the first opening of the cap to be seen, without making the cap difficult to open.

[0070] It is apparent that one skilled in the art, in order to meet contingent needs, may make changes to the cap described above, without departing from the scope of protection as described and claimed herein.

1. A flip-top cap for thin-walled flexible bags, generally known as pouches, the flip-top cap comprising:

- a skirt consisting of a tubular skirt wall;
 - a tube having a central main axis (X), comprising a tubular tube wall defining a mouth;
 - a main surface orthogonal to the central main axis (X), said tube axially protruding from the main surface;
 - at least one warranty window on said main surface, provided with hooking elements;
 - a closure hinged to said skirt to rotate about a hinge axis (Y) orthogonal to the central main axis (X), suitable to close said mouth of the tube;
 - at least one warranty hook, integral with the closure by at least one breakable element;
 - a tubular connection portion, having axial extension, arranged inside the tubular skirt wall and radially spaced therefrom, between the tubular connection portion and the tubular skirt wall creating a gap accessible at the top through said at least one warranty window;
- wherein, in a closed configuration of the flip-top cap, said at least one warranty hook is inserted through the at least one warranty window; and
- to switch to an open configuration, said at least one warranty hook engages with said hooking elements and said at least one breakable element, encounters breakage due to a resistance exerted by said hooking elements, and remains confined in the gap.

2. The flip-top cap of claim **1**, wherein said at least one warranty hook, in an unopened cap configuration, protrudes from a free cover edge of a cover of the closure.

3. The flip-top cap of claim **2**, wherein a first warranty hook and a second warranty hook are provided, arranged diametrically opposite to the tube.

4. The flip-top cap of claim **1**, wherein said hooking elements comprise at least one warranty tab projecting inside said at least one warranty window.

5. The flip-top cap of claim **4**, wherein said at least one warranty tab is flexible to allow snap engagement with the at least one warranty hook at a first closure of the flip-top cap.

6. The flip-top cap of claim **4**, wherein, in an opening configuration, said at least one warranty tab is suitable to create an obstacle to release of the at least one warranty hook from the gap through the at least one warranty window.

7. The flip-top cap of claim **1**, wherein the skirt has externally, in a predefined angular position, an underlying region detectable by touch.

8. The flip-top cap of claim **7**, wherein the closure comprises an opening ridge in a predefined angular position, such that, in the closed configuration, said opening ridge overlaps said underlying region.

9. The flip-top cap of claim **1**, wherein the closure comprises a tubular tang adapted to penetrate into the tube through the mouth to close it tightly.

10. The flip-top cap of claim **1**, further comprising a hinge for hinging the closure with the skirt wherein said hinge comprises at least one shank joining the skirt to the closure, wherein said at least one shank has two parts: a first shank part joined to the skirt and a second shank part joined to the closure, said first and second shank parts being joined together to form a bendable knee.

11. The flip-top cap of claim **10**, wherein a first shank and a second shank are provided, spaced from each other.

12. The flip-top cap of claim **1**, further comprising elastic elements adapted to bring the closure towards the closed configuration.

13. The flip-top cap of claim **12**, wherein said elastic elements comprise a sheet, elastically deformable and connected to the skirt and to the closure, so as to push the closure towards the closed configuration.

14. The flip-top cap of claim **12**, wherein said elastic elements are also adapted to bring the closure into a fully open configuration, when said closure is beyond an angular limit closing position.

15. The flip-top cap of claim **14**, wherein said angular limit closing position corresponds to an inclination of 45° of the closure with respect to the main surface.

16. An assembly comprising:

- a thin-walled flexible bag, generally known as a pouch, provided with a spout; and
 - a flip-top cap comprising:
 - a skirt consisting of a tubular skirt wall;
 - a tube having a central main axis (X), comprising a tubular tube wall defining a mouth;
 - a main surface orthogonal to the central main axis (X), said tube axially protruding from the main surface;
 - at least one warranty window on said main surface, provided with hooking elements;
 - a closure hinged to said skirt to rotate about a hinge axis (Y) orthogonal to the central main axis (X), suitable to close said mouth of the tube;
 - at least one warranty hook, integral with the closure by at least one breakable element;
 - a tubular connection portion, having axial extension, arranged inside the tubular skirt wall and radially spaced therefrom, between the tubular connection portion and the tubular skirt wall creating a gap accessible at the top through said at least one warranty window;
- wherein, in a closed configuration of the flip-top cap, said at least one warranty hook is inserted through the at least one warranty window; and
- to switch to an open configuration, said at least one warranty hook engages with said hooking elements and said at least one breakable element, encounters breakage due to a resistance exerted by said hooking elements, and remains confined in the gap,
- said flip-top cap being applied to the pouch.

17. The assembly of claim **16**, wherein the flip-top cap is screwable onto the spout.

18. An assembly comprising:

- a spout;
- a flip-top cap comprising:
 - a skirt consisting of a tubular skirt wall;
 - a tube having a central main axis (X), comprising a tubular tube wall defining a mouth;

a main surface orthogonal to the central main axis (X), said tube axially protruding from the main surface;
at least one warranty window on said main surface, provided with hooking elements;
a closure hinged to said skirt to rotate about a hinge axis (Y) orthogonal to the central main axis (X), suitable to close said mouth of the tube;
at least one warranty hook, integral with the closure by at least one breakable element;
a tubular connection portion, having axial extension, arranged inside the tubular skirt wall and radially spaced therefrom, between the tubular connection portion and the tubular skirt wall creating a gap accessible at the top through said at least one warranty window;
wherein, in a closed configuration of the flip-top cap, said at least one warranty hook is inserted through the at least one warranty window; and
to switch to an open configuration, said at least one warranty hook engages with said hooking elements and said at least one breakable element, encounters breakage due to a resistance exerted by said hooking elements, and remains confined in the gap, the flip-top cap being applied to the spout;
wherein the gap is closed at the bottom by a portion of the spout.

* * * * *