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(54) **IMPROVED DOSING SYSTEM**

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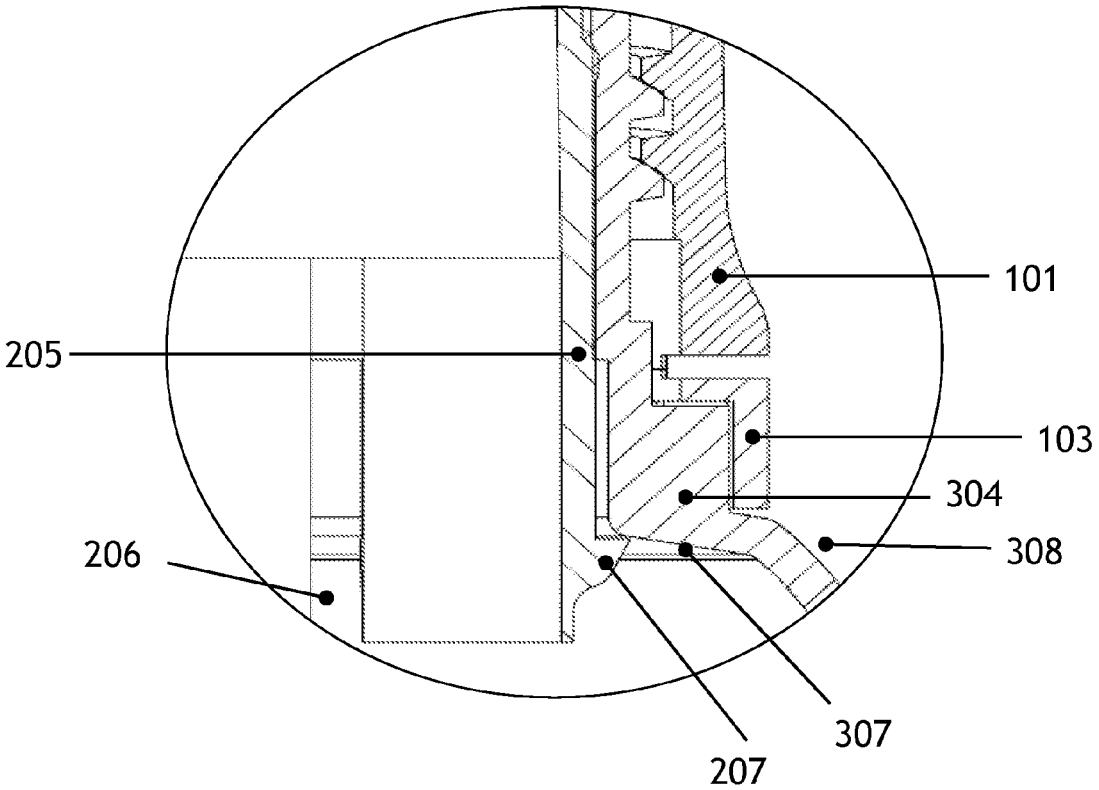
(57) **ABSTRACT**

The present invention refers to an improved dispensing system for liquid dispensing in the form of drops, comprising: a cap; a dosage unit having a skirt showing a protrusion or edge at its lower end; and a container having a shoulder surface located at the inner part of the shoulder, wherein the shoulder surface holds the dosage unit through interfering with said protrusion or edge of the insert thus avoiding that the dosage unit can be removed from the container. While opening the improved dispensing system according to the present invention, a ring attached to the cap body breaks in sections, preventing said ring to be relocated in the cap and, thus, avoiding that the dosage unit can be reused for filling a different substance.



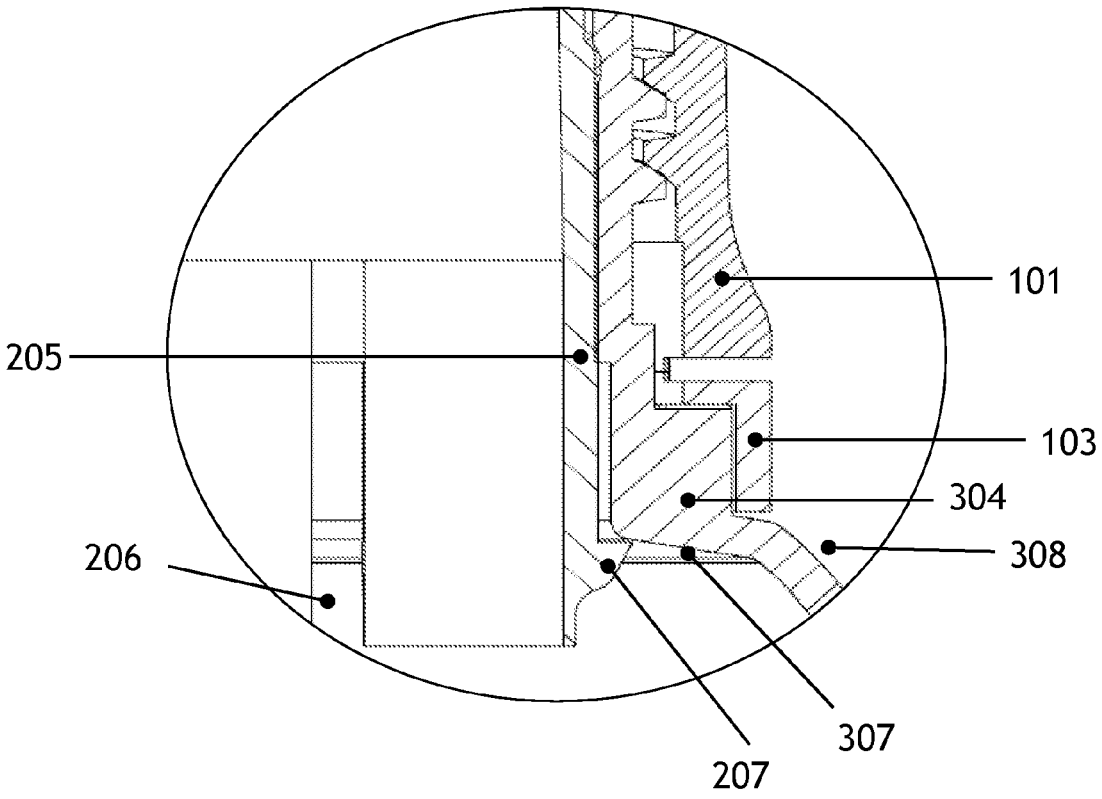


FIG 1

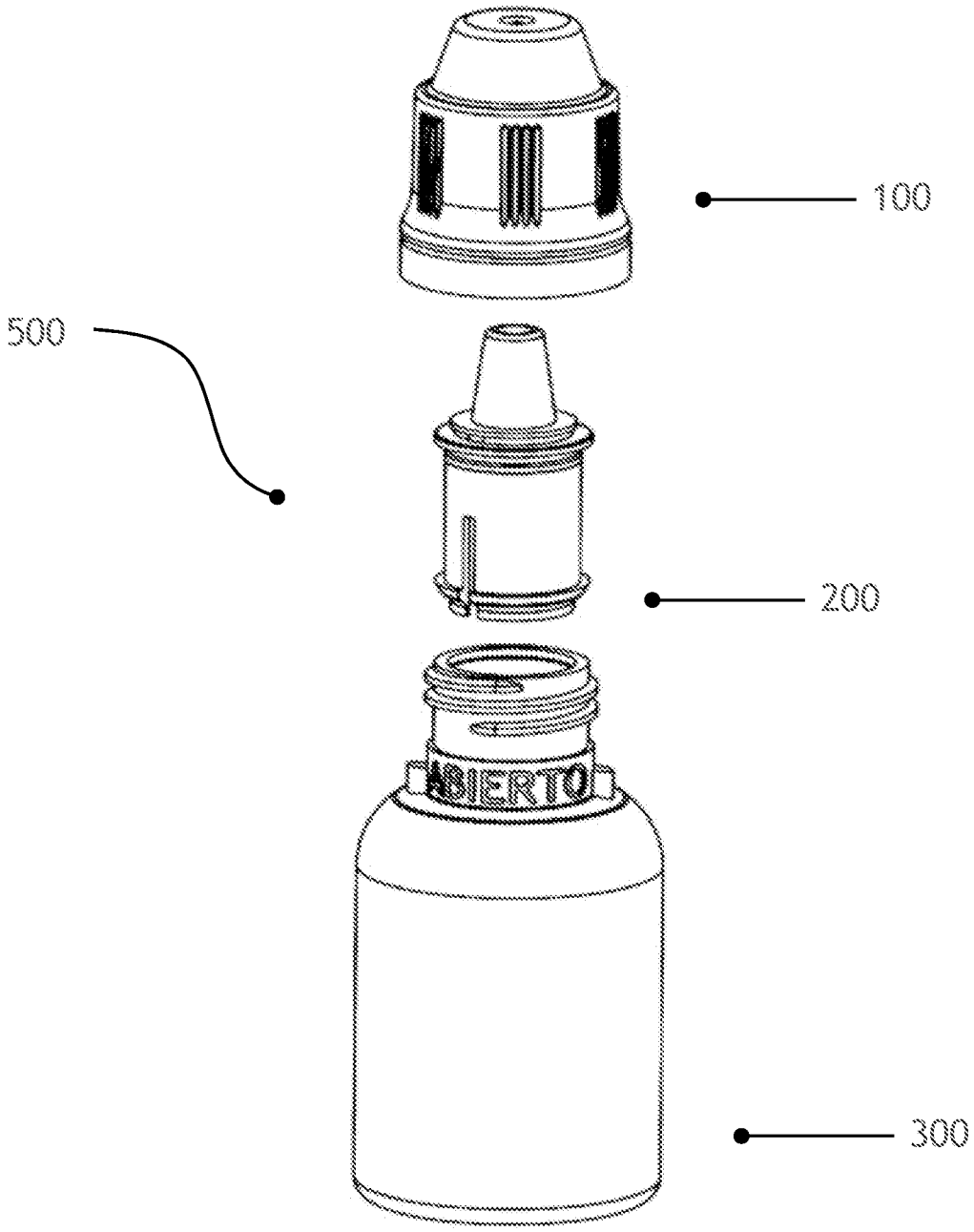


FIG 2

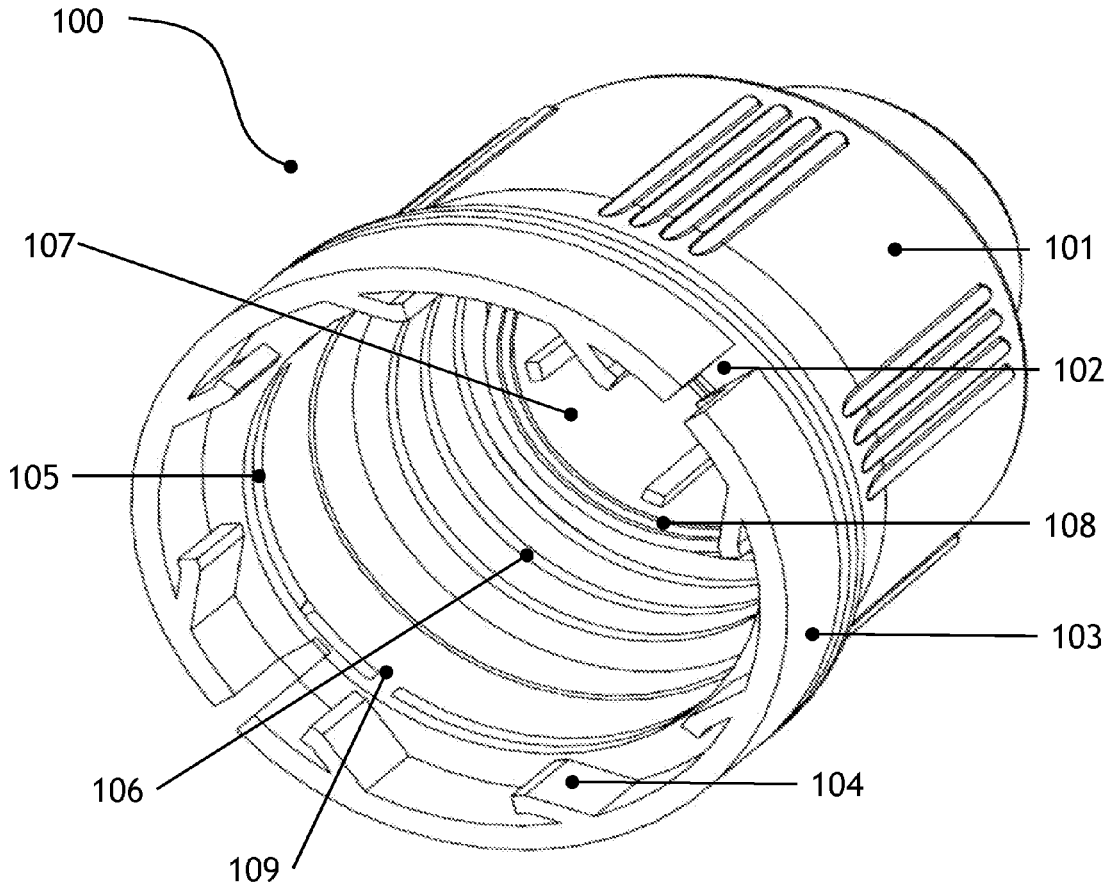


FIG 3

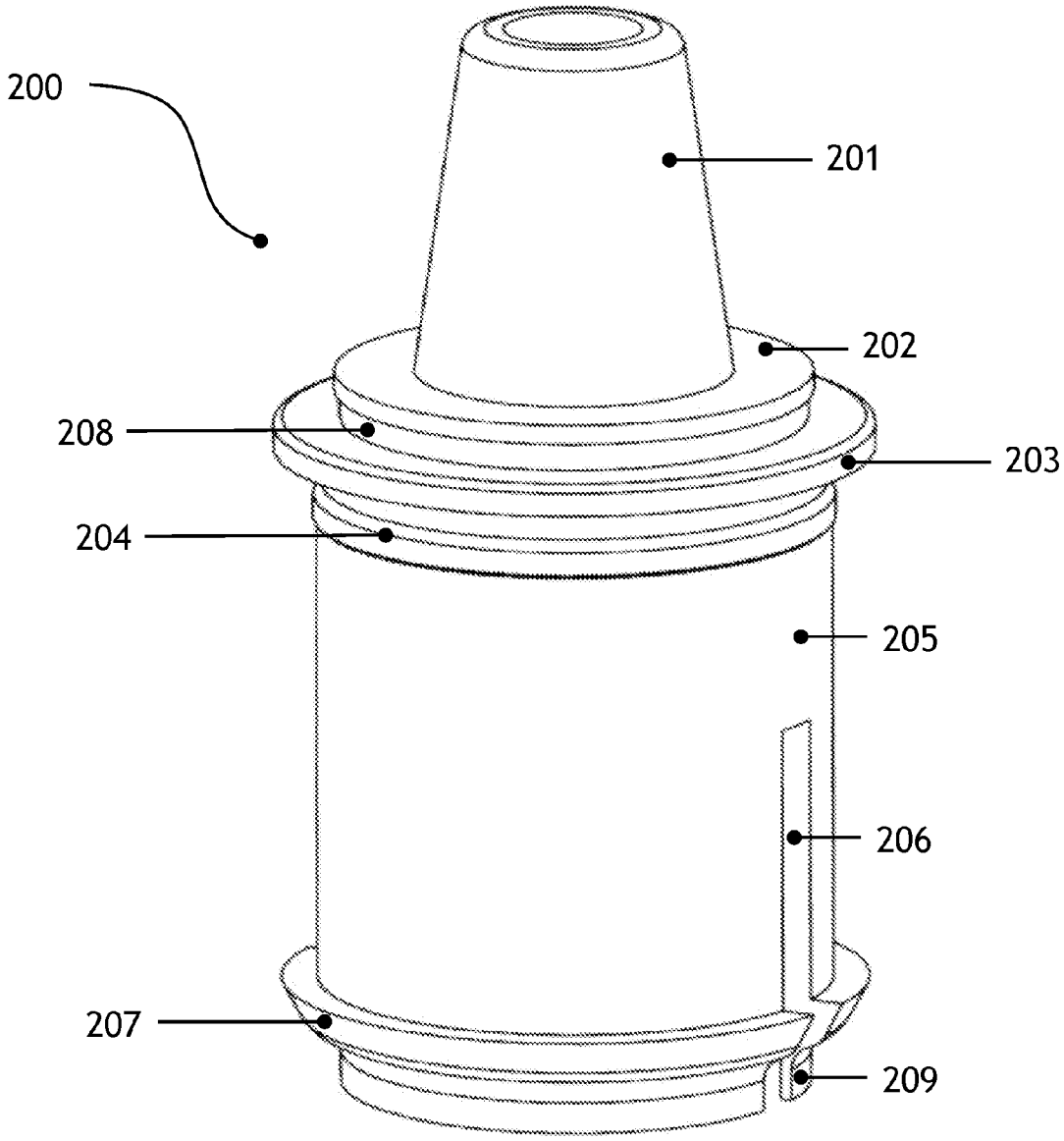


FIG 4

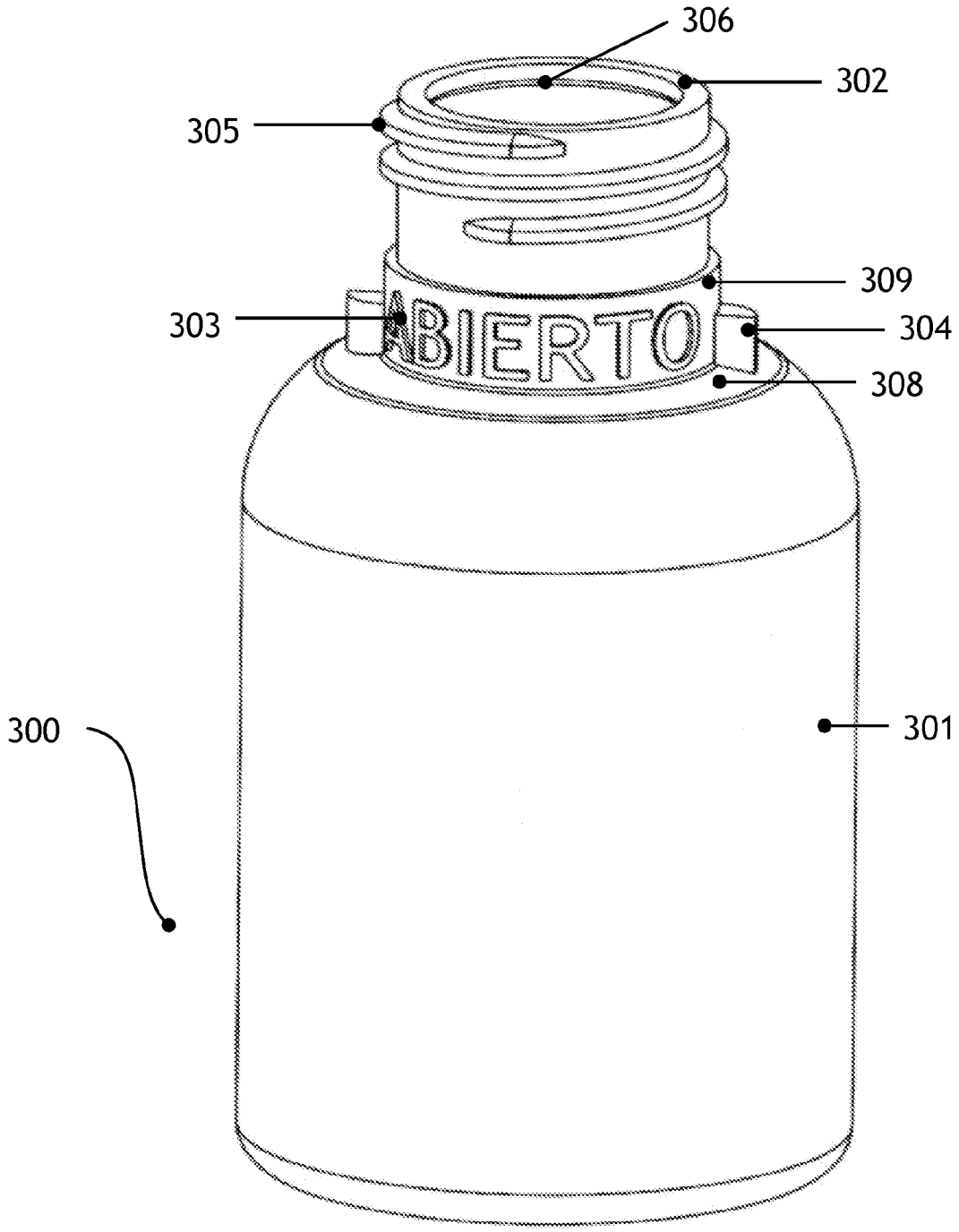


FIG 5

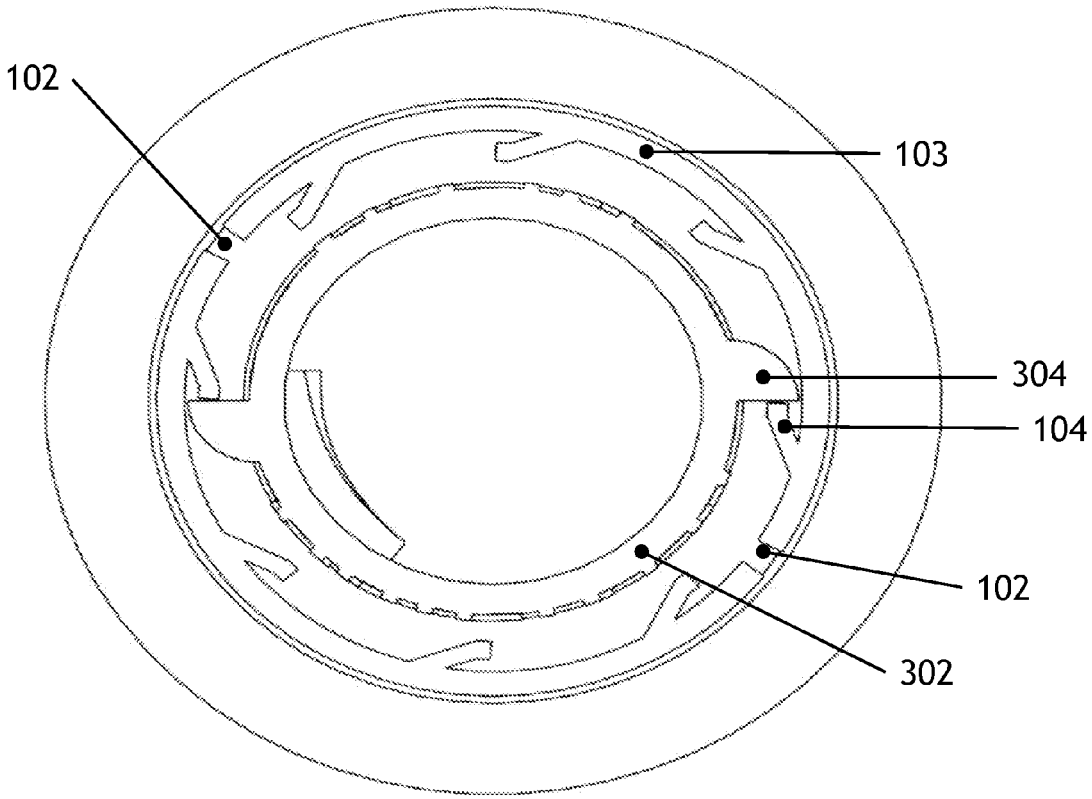


FIG 6

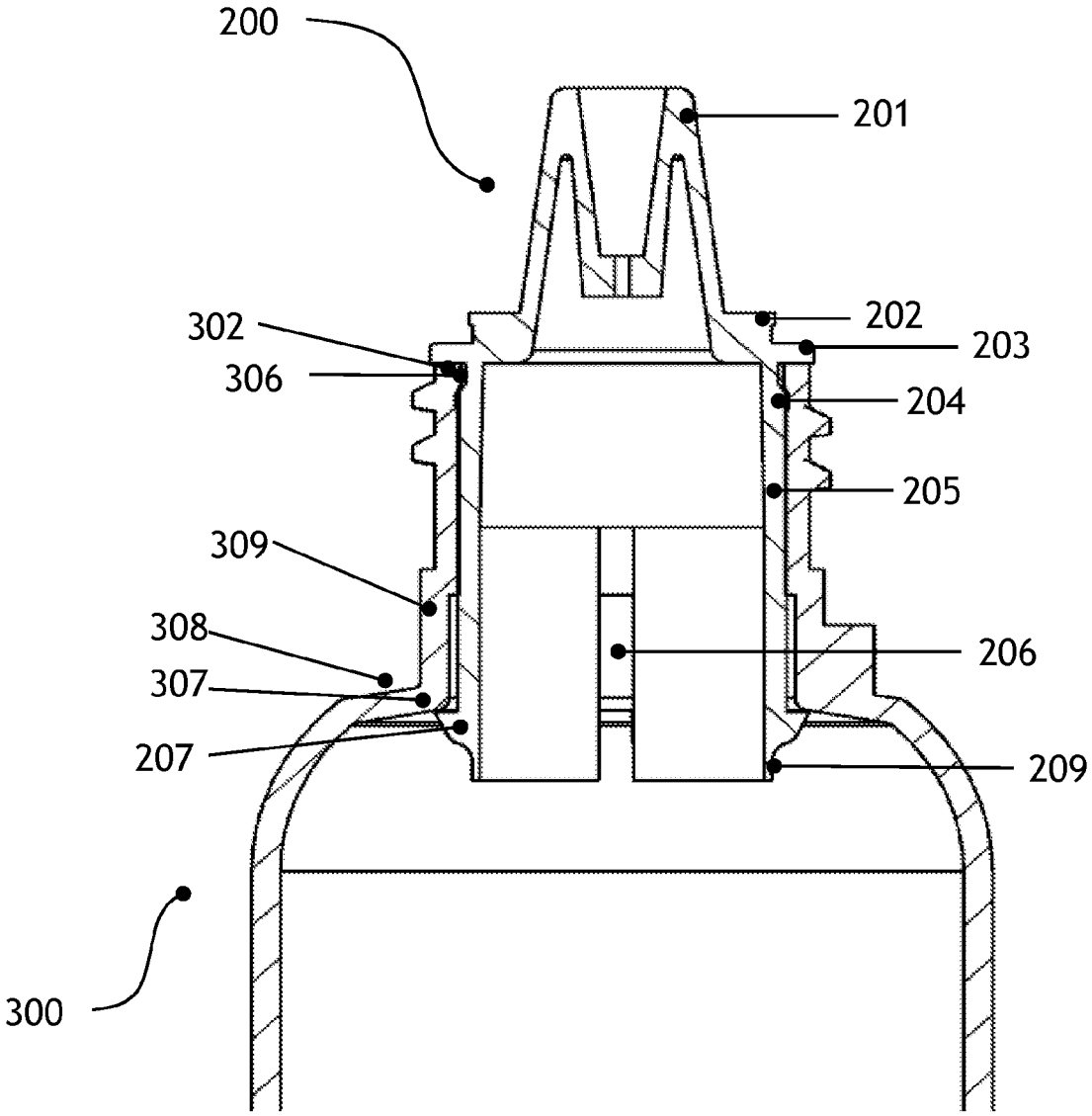


FIG 7

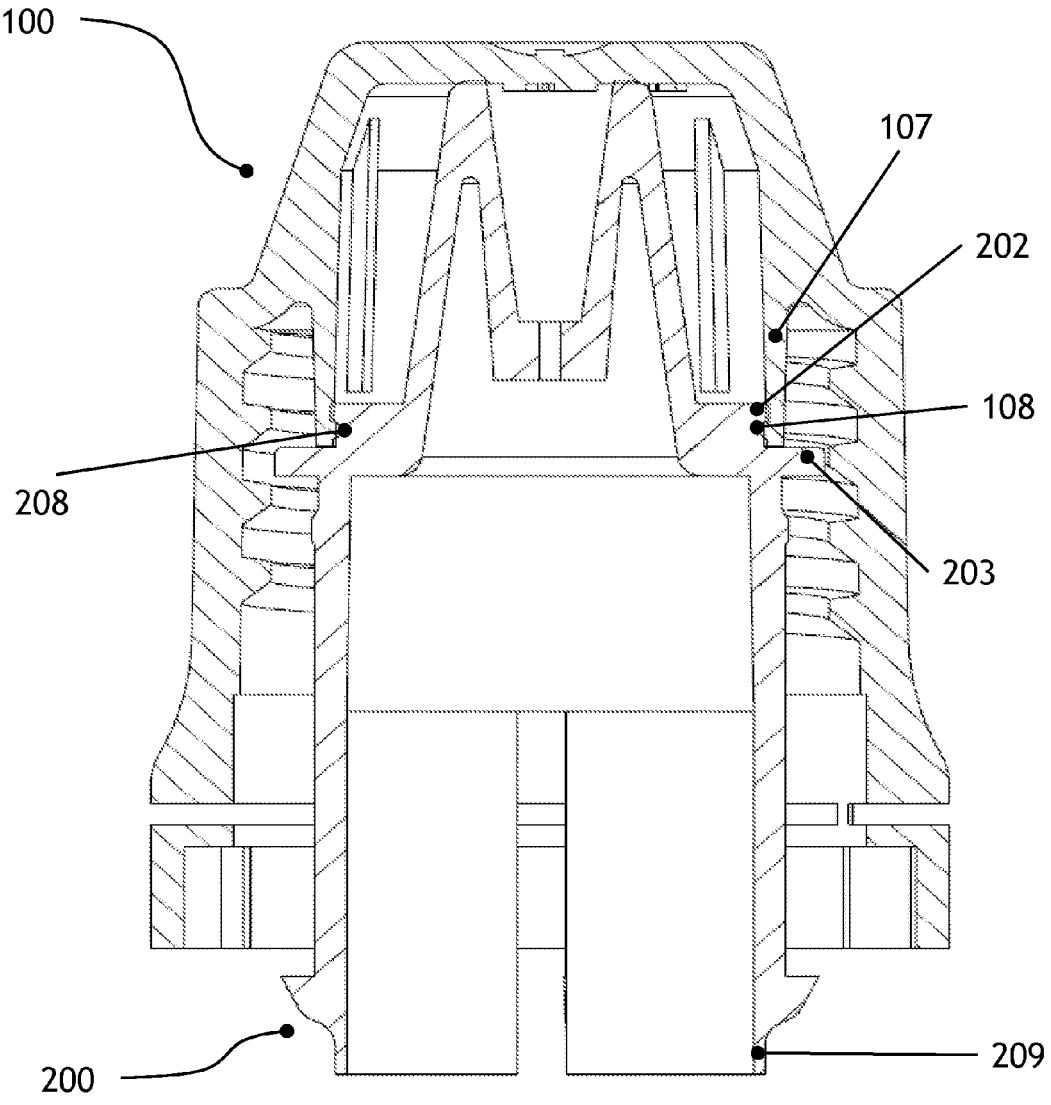


FIG 8

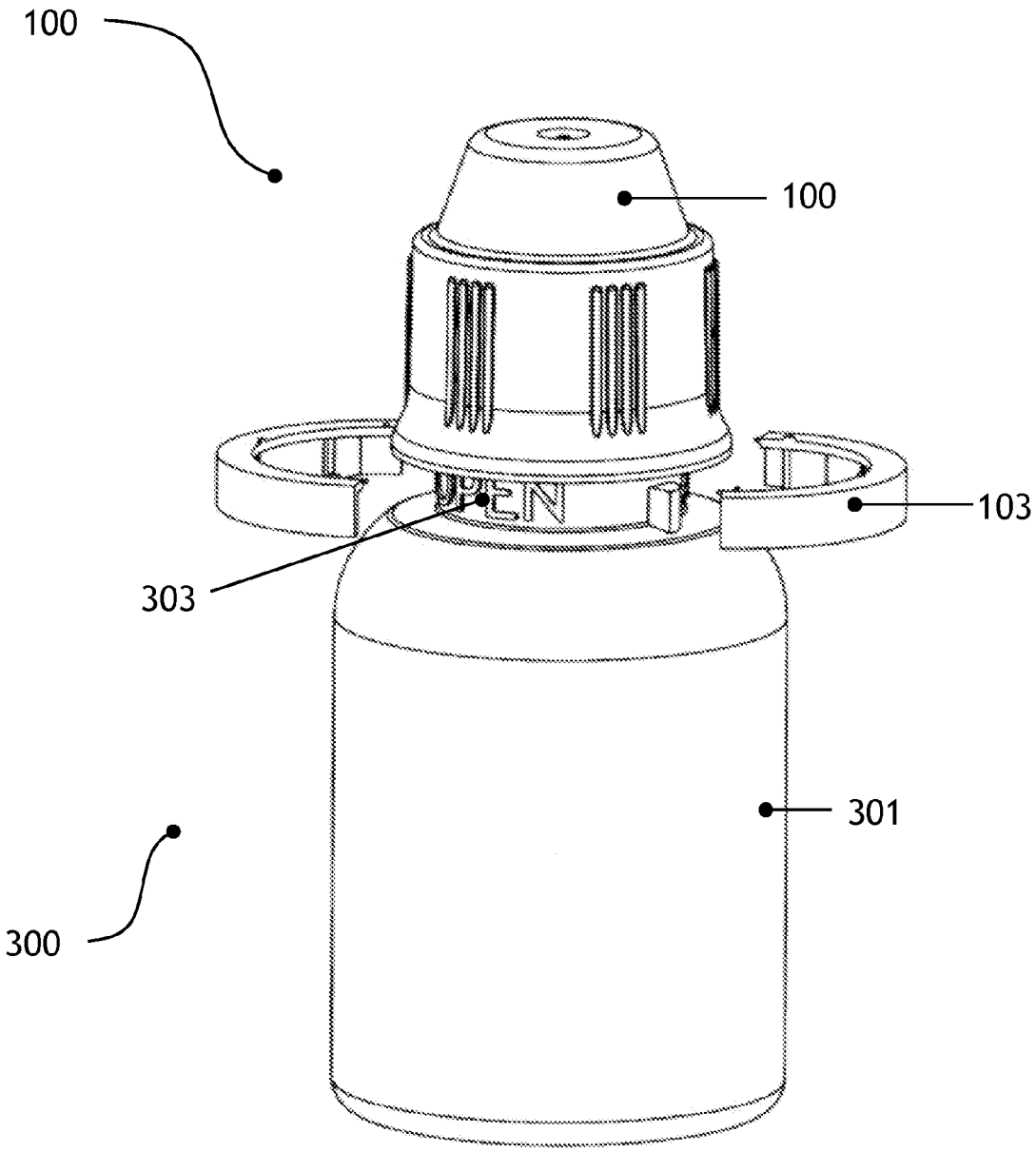


FIG 9

IMPROVED DOSING SYSTEM

FIELD OF THE INVENTION

[0001] The present invention relates to the field of containers that allow a controlled dosing or individual drop dosage, more particularly, the invention refers to a system comprising a container having a tamper evident safety cap and a non-refillable tamper proof dosage unit which does not allow to be reusable.

BACKGROUND OF THE INVENTION

[0002] In the field of containers for liquid products there has been the need for developing containers that allow evidencing the aperture or tampering thereof which is known in this area as "tamper evident" in order to offer the final consumer the confidence that the container has not been previously opened, and that its content has not been altered.

[0003] Also, recently, there has been the need for producing containers that do not allow the final user to manipulate it, for example, reusing the container for a different purpose. In particular, it has been observed that final consumers of the product contained in the container, are frequently reusing the container by removing the dosage element from the container or bottle and refilling the container with a different substance.

[0004] Such container reutilization practice has various undesirable consequences but mainly, causes that an unaware user thinks that the content of the container is the originally liquid which can cause an accident through the administration of a wrong liquid to a patient, for example, assuming that the original liquid is being dispensed.

[0005] There are in the market various types of containers having dosage units for eyedroppers and having tamper evident caps. For example, the Colombian patent application 11-145696 shows a cap assembly, eyedropper insert having a tamper evident mechanism, wherein a collar is detached when the cap is opened. But, this invention does not include a mechanism preventing the container to be refilled with another liquid once the product has been opened.

[0006] Also, patent publication WO 2006/0585011A1 discloses a container having a cap and an eyedropper insert. This publication does neither provide a tamper evident mechanism nor a mechanism for preventing the container to be reused.

[0007] Facing this problem, it is necessary to develop containers for containing liquid products that not only have a system that allows evidencing the opening or manipulation for the final consumer safety, but also includes a mechanism the prevents the reutilization of the container, for example preventing the removal of the eyedropper insert, thus avoiding, or at least making more difficult refilling the container.

DESCRIPTION OF THE INVENTION

[0008] The present invention consists in an improved dispensing system for liquid dispensing in the form of drops, comprising a cap; a dosage unit having a skirt showing a protrusion or edge; and a container having a shoulder surface located at the inner part of the shoulder; wherein, the shoulder surface holds the dosage unit through the interference of said protrusion or edge with the dosage unit.

[0009] While opening the dispensing system according to the present invention, a ring attached to the cap body breaks in sections, preventing said ring to be again located in the cap and, thus, evidencing that the dispensing system of the invention was previously opened.

BRIEF DESCRIPTION OF THE FIGURES

[0010] The present description is complemented with a set of illustrative drawings of the preferred and non-limitative examples of the invention.

[0011] FIG. **1** shows a magnified cross section view of the improved dispensing system (**500**).

[0012] FIG. **2** shows an explosion view of the improved dispensing system (**500**) according to the invention.

[0013] FIG. **3** shows a bottom view of the cap (**100**) wherein the elements forming same are detailed.

[0014] FIG. **4** shows a front view of the dosage unit (**200**), wherein the elements forming same are detailed.

[0015] FIG. **5** shows a front view of container (**300**).

[0016] FIG. **6** shows a bottom view of the cap (**100**).

[0017] FIG. **7** shows a cross-section view of the dosage unit (**200**) assembled in the container (**300**).

[0018] FIG. **8** shows a cross-section view of pre-assembled cap assembly (**100**) and dosage unit (**200**), prior to be attached to the container (**300**).

[0019] FIG. **9** shows a detail of the ring system which allows evidencing the manipulation of the cap (**100**).

LIST OF THE ELEMENTS OF THE INVENTION

[0020] **500** Dispensing system
[0021] **100** Cap
[0022] **101** Cap body
[0023] **102** Slots
[0024] **103** Ring
[0025] **104** Fins
[0026] **105** Annular cut
[0027] **106** inner thread
[0028] **107** inner ring
[0029] **108** ring projection
[0030] **109** binding points
[0031] **200** Dosage unit
[0032] **201** dosage portion
[0033] **202** Protrusion
[0034] **203** Adjustment surface
[0035] **204** Retaining ring
[0036] **205** Skirt
[0037] **206** Adjustment aperture
[0038] **207** protrusion or edge
[0039] **208** Channel
[0040] **209** Positioning portion
[0041] **300** Container
[0042] **301** Container body
[0043] **302** Container opening
[0044] **303** Inscription/warning
[0045] **304** Ratchet
[0046] **305** Thread
[0047] **306** Container retaining ring
[0048] **307** Shoulder surface
[0049] **308** Shoulder
[0050] **309** Container neck

DETAILED DESCRIPTION OF THE INVENTION

[0051] The present invention consists in a dispensing system (**500**) for liquid dispensing in the form of drops which comprises a cap (**100**), a dosage unit (**200**) having a

skirt (**205**) showing a protrusion or edge (**207**) at its lower end and a container (**300**) having a shoulder surface (**307**) located at the inner part of the shoulder (**308**), wherein the shoulder surface (**307**) holds the dosage unit (**200**) through the interference of said protrusion or edge (**207**) with the dosage unit (**200**).

[0052] The explosion view of the elements of the dispensing system (**500**) of the invention can be seen in FIG. **2**.

[0053] As can be seen in FIG. **3**, the cap (**100**) is provided with an inner ring (**107**), a ring projection (**108**) of the inner ring (**107**), a ring (**103**) attached to the cap body (**101**) through a plurality of binding points (**109**) radially located on ring (**103**), fins (**104**) located in the inner part of the ring (**103**) and slots (**102**) perpendicularly located on the ring (**103**).

[0054] As can be observed in FIG. **4**, the dosage unit (**200**) comprises a dosage portion (**201**) located on the upper segment of the dosage unit (**200**), a protrusion (**202**) located at the lower part of the dosage portion (**201**), an adjustment surface (**203**) located between the dosage portion (**201**) and a skirt (**205**) of the dosage unit (**200**).

[0055] The dosage unit (**200**) further comprises a retaining ring (**204**), an adjustment aperture (**206**), a protrusion or edge (**207**) located at the lower part of the skirt (**205**), a channel (**208**) and a positioning portion (**209**) located at the lower part of the dosage unit (**200**) immediately below the protrusion or edge (**207**).

[0056] According to FIG. **5**, the container (**300**) is provided with a thread (**305**) located on the outer part or the container opening (**302**), a container retaining ring (**306**) (shown in FIG. **7**), located at the inner part of the container opening (**302**), ratchets (**304**) located at the outer part of the container neck (**309**), a surface (**307**) (Shown in FIG. **1** and FIG. **7**), located at the inner part of container (**300**) and radially extending over the shoulder (**308**).

[0057] In the aperture operation of dispensing system (**500**), the fins (**104**) of the cap (**100**) face the ratchets (**304**) of the container (**300**) when the cap (**100**) rotates, causing ring (**103**) to detach from the cap body (**101**) along the annular cut (**105**) and the bindings between the semi-rings forming the ring break, due to shearing of the binding points (**109**) and finally, the ring (**103**) is divided in sections according to the slots (**102**), see FIG. **6**).

[0058] During the dosage unit (**200**) assembling onto the container (**300**) as seen in FIG. **7**, once the container (**300**) has been filled with the desired liquid, the dosage unit (**200**) is fixedly/inseparably embedded in container (**300**) when it slides through the container opening (**302**) and along the container neck (**309**) which is possible by the adjustment aperture (**206**) contraction until the protrusion or edge (**207**) of the dosage unit (**200**) exceeds surface (**307**) of container (**300**) thus obtaining a safe assembly of the dosage unit (**200**) in the container (**300**) as the protrusion or edge (**207**) remains secured against the container neck (**309**).

[0059] According to FIG. **8**, the dosage unit (**200**) is fitted in the cap (**100**) through the connection between the ring projection (**108**) of the cap, within the channel (**208**) located beneath the protrusion (**202**) in the dosage unit (**200**).

[0060] Assembling the cap (**100**), the dosage unit (**200**) and the container (**300**) can be carried out through initially pre-assembling the dosage unit (**200**) into the cap (**100**), then locate this pre-assembled unit over the neck (**309**) of the container (**300**) and closing using the thread (**305**) and the inner thread (**106**).

[0061] During the aperture of the dispenser (**500**), the ring (**103**) definitively breaks into sections, preventing said ring (**103**) to be relocated in the cap (**100**) as can be seen in FIG. **9** of the invention.

[0062] The container (**300**) may further have an inscription or warning label (**303**) located at the outer lower part of the container opening (**302**) such that when ring (**103**) is released or detached by removing the cap for the first time, said warning (**303**) becomes visible to the eyes of the consumer, advising him/her that said container has been opened. See FIG. **9**.

[0063] Other embodiments of the present invention evident to those skilled in the art after the description of the present invention has been read and the invention practiced, are understood to be included within the scope of protection of the present invention. The present description is illustrative and not limitative of the scope and spirit of the invention, which is only limited by the following claims.

1. An improved dispensing system (**500**) comprising:

a cap (**100**);

a dosage unit (**200**), having a skirt (**205**) which shows at its lower end a protrusion or edge (**207**); and

a container (**300**) having a surface (**307**) located at the inner part of the shoulder (**308**), wherein the surface (**307**) holds the dosage unit (**200**) through the interference with said protrusion or edge (**207**) of the dosage unit (**200**).

2. The improved dispensing system (**500**) according to claim **1** wherein the cap (**100**) is of the kind having a thread and comprises:

An inner ring (**107**);

a ring projection (**108**) of the inner ring (**107**);

a ring (**103**) attached to the cap body (**101**) through a plurality of binding points (**109**);

Fins (**104**) located at the inner part of ring (**103**); and

Slots (**102**) perpendicularly located in the ring (**103**).

3. The improved dispensing system (**500**) according to claim **1** wherein ring (**103**) has various divisions according to the slots.

4. The improved dispensing system (**500**) according to claim **1** wherein the dosage unit (**200**) comprises:

A skirt (**205**) and an frustoconical-shaped upper element (**201**), wherein the skirt has two side adjustment apertures, a protrusion or edge (**207**) having a ratchet tooth profile located in the lower part of the skirt (**205**), wherein the frustoconical element (**201**) lays over a washer (**202**) which is an integral part of the frustoconical element (**201**) and the skirt (**205**) of the dosage unit (**200**); a retaining ring (**204**); a protrusion or edge (**207**) located at the lower part of the skirt (**205**), a channel (**208**) located between the adjustment protrusion or edge (**203**) and the washer (**202**) of the frustoconical element (**201**), wherein said frustoconical element (**201**) correspond to a dosage nozzle.

5. The improved dispensing system (**500**) according to claim **1** wherein the container (**300**) comprises:

A thread (**305**) located at the outer part of the container opening (**302**);

A container retaining ring (**306**), located at the inner part of the container opening (**302**);

Ratchets (**304**) located at the outer part of the container neck (**309**);

a surface (**307**) located at the inner part of the container (**300**) and radially extending along the inside of the shoulder (**308**).

6. The improved dispensing system (**500**) according to claim **1**, wherein during the opening operation of system (**500**), the fins (**104**) of the cap (**100**) are facing the ratchets (**304**) of the container (**300**) when the cap (**100**) rotates, causing the ring (**103**) to detach from the cap body (**101**) along the annular cut (**105**) due to the binding points (**109**) shearing and finally, ring (**103**) divides into sections according to the slots (**102**).

7. The improved dispensing system (**500**) according to claim **1** wherein the dosage unit (**200**) is permanently embedded into the container (**300**) when sliding through the container opening (**302**) and along the container neck (**309**) which is possible due to the contraction of the adjustment apertures (**206**) until the protrusion or edge (**207**) of the dosage unit (**200**) exceeds surface (**307**) of container (**300**) obtaining a safe assembly of the dosage unit (**200**) in the container (**300**) as the protrusion or edge (**207**) remains secured against the container neck (**309**).

8. The improved dispensing system (**500**) according to claim **1** wherein optionally the dosage unit (**200**) fits into the cap (**100**) through the connection between the ring projection (**108**) of the cap, within the channel (**208**) located beneath the washer (**202**) of the dosage unit (**200**) allowing pre-assembling the dosage unit.

9. The improved dispensing system (**500**) according to claim **8** wherein assembling cap (**100**), dosage unit (**200**) and container (**300**) is carried out through locating the pre-assembled unit of the dosage unit (**200**) and the cap (**100**) over the neck (**309**) of container (**300**) and closing using the thread (**305**) and the inner thread (**106**).

10. The improved dispensing system (**500**) according to claim **6** wherein after the dispensing system (**500**) has been opened, ring (**103**) breaks in sections, preventing said ring (**103**) to be relocated in the cap (**100**).

11. The improved dispensing system (**500**) according to claim **4** wherein container (**300**) further has an inscription or warning (**303**) located at the lower outer part of the container opening (**302**).

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