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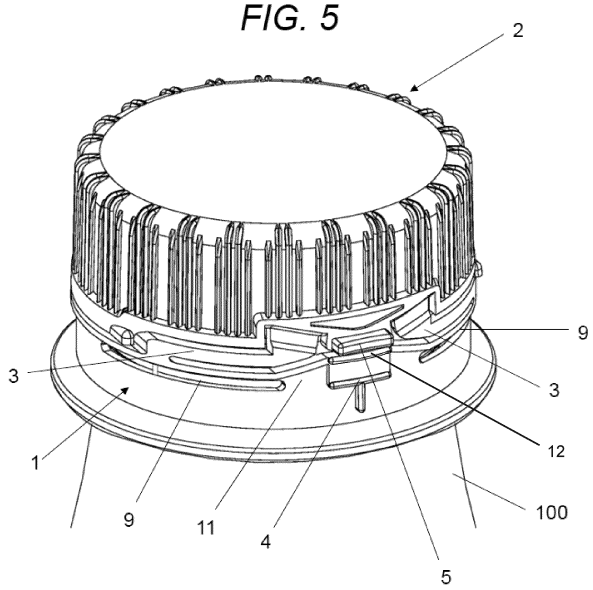
(54) SCREW-ON CLOSING CAP FOR CONTAINERS AND A CONTAINER PROVIDED WITH SAID CAP

(57) The present invention relates to a closing cap for containers that have a neck provided with a threaded portion, comprising a lower ring that can be coupled to the neck of the container and an upper cap (2) having a thread configured to be coupled to the outer threaded portion of the neck, the upper cap (2) and the lower ring (1) being integrally joined together. The upper cap (2) and the lower ring (1) are joined by means of two flexible extensions (3) diametrically opposed to each other, each one formed by a thickening in the lower ring that includes a grooved portion (7), such that the two extensions have the same outer diameter as the outer diameter of the thickening, the lower edge of the body of the upper cap having a step where the extensions are located, such that in a closed condition both extensions (3) are arranged above and parallel to the body of the lower ring (1). Openings in the lower ring (1) are provided running parallel to the lower edge of the lower ring (1), arranged radially and at least partially underlying the grooved portion (7).

FIG. 5



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Description

OBJECT OF THE INVENTION

[0001] The object of this application is the registration of a screw-on closing cap for containers, as well as a container provided with said cap.

[0002] More specifically, the invention proposes the development of a cap provided with an upper cap and a lower ring fixed together in such a way that they do not separate during the screwing and/or unscrewing of the cap on a container neck intended for packaging carbonated beverages, non-carbonated beverages or mineral water.

BACKGROUND OF THE INVENTION

[0003] In the sector of packaging food products (solid, liquid, viscous substances, etc.), closing caps made from plastic material have been used for many years, caps which are provided with an inner thread that can be screwed on threading formed on the neck of the container itself, enabling the contents inside the container to be kept airtight, for example, in the case of a bottle of the type used for bottling beverages, such as mineral water, soft drinks or the like.

[0004] Closing caps for containers are known in the prior art, in particular caps intended for containers that have an opening in a neck provided with an outer threaded portion, comprising a lower ring configured to be coupled to the neck of the container and an upper cap having on the inner face thereof a thread configured to be coupled to the outer threaded portion of a container neck. The upper cap and the lower ring are articulated to each other by means of a hinged portion, such that the upper cap can rise through the threaded portion of the neck while the lower ring remains in its original position in order not to separate the closing system of the container with respect to the container itself. An example of this type of cap is described in documents ES 1247151 and ES 1237189.

[0005] However, due to the design of concentric rings and the design of the hinged section, it requires relatively complex injection moulds and injection cycles higher than those of other caps, since it is necessary to have multiple mobile mechanisms and sliders that act during the manufacturing cycle, especially due to the complexity of the process for removing the piece from the mould once injected. Consequently, the manufacturing costs for caps of this type are higher. Therefore, there is a need to develop a cap for containers that solves the problems raised.

[0006] Similar caps are also known where the lower ring is made up of two rings located one above the other, such that the incorporation of caps of this type in the containers does not allow the height of the neck to be reduced and, consequently, does not allow the amount of material intended for the manufacture of the container to be reduced, an aspect that is currently desired in this sector, for environmental purposes. Moreover, this height can also be negatively affected by the arrangement of the break points that act as a tamper-evident seal, which further favour a greater height of the lower ring.

[0007] Furthermore, the applicant is currently unaware of an invention that has all the features described in this specification.

DESCRIPTION OF THE INVENTION

[0008] The present invention has been developed with the aim of providing a closing cap that is configured as a novelty within the field of application and solves the previously mentioned drawbacks, further contributing other additional advantages that will be obvious from the description below.

[0009] An object of the present invention is to therefore provide a closing cap for containers, in particular caps intended for containers that have an opening in a neck provided with an outer threaded portion, being of the type that comprises a lower ring configured to be coupled to the neck of the container and an upper cap having on the inner face thereof a thread configured to be coupled to the outer threaded portion of a container neck, the upper cap and the lower ring being joined together in such a way that they are able to rotate integrally with each other.

[0010] In particular, the invention is characterised in that the upper cap and the lower ring are joined by means of two extensions with a certain degree of flexibility that are diametrically opposed to each other, each one formed by a thickening in the lower ring that includes a grooved portion such that the extensions are formed above the grooved portion, in such a way that the two extensions have the same outer diameter as the outer diameter of the thickening, the lower edge of the body of the upper cap having a step that defines a recessed portion in which the extensions are located, such that in a closed condition both extensions are arranged above and parallel to the body of the lower ring, while in an open position of the closing cap, the upper end of the extensions acts as a hinge region in such a way that the cap is able to rotate.

[0011] Due to the previously defined arrangement, the cap can have great freedom of movement and can easily rise through the threaded portion of the neck during unscrewing, without undergoing resistance in the opposite direction. In the same way, in an open position of the closing cap, the lateral extensions remain away from the outer thread of the container neck, providing great freedom of movement to the cap, without any kind of stress, making it easier for the user to position and centre the cap on the mouth of the container, which is required to suitably screw the cap during the action of closing the container.

[0012] With this new configuration, it is also possible

to reduce the amount of material needed to manufacture the lower ring of the closing cap, allowing a height lower than the rings of the caps developed to remain joined to the container once unscrewed, which implies a reduction in manufacturing costs.

[0013] Moreover, linear openings in the lower ring are provided running parallel to the lower edge of said lower ring and the linear openings being arranged radially and at least partially underlying the grooved portion and spaced apart from each other. The presence of these linear openings provides an additional degree of flexibility during the unscrewing and screwing phases of the closing cap, being especially suitable for necks of containers (for example, bottles) with threaded sections of greater height, in which the movement capability of the grooved portions alone is not enough to achieve freedom of movement; it is therefore clear that this makes it easier for the user to use to the closing cap.

[0014] On the other hand, the manufacturing process is also facilitated by using injection moulds where slider and removal systems of a certain complexity are not required, since the hinge area had by other caps of the prior art is eliminated. It is important to note that the use of simpler manufacturing means helps to reduce the injection cycle.

[0015] Furthermore, another no less important aspect of the closing cap of the invention is that it does not cause problems (such as friction with the side walls of the channels through which the caps circulate) in the cap feed lines during their automated placement on the neck of containers in bottling plants, since parts of the cap with the diameter defined by the upper cap and lower ring do not protrude excessively.

[0016] Moreover, this design allows the flexing area of the extensions to be at a height greater than the flexing area that is created when a horizontal cut is made in the lower ring, such that the unscrewing path that the cap must follow is shorter and the user requires less handling time.

[0017] According to another aspect of the invention, stop means are provided which are intended to fixedly hold the upper cap in an inverted position with respect to the arrangement taken on by the upper cap during the closed position.

[0018] Preferably, the stop means may comprise a projection that protrudes from the lower ring, which is aligned in height with a tab that protrudes laterally from the lower edge of the upper cap, such that, in an open condition, the tab abuts an upper surface of the projection, in which the tab has a curved path adaptable to the radius of curvature of the lower ring.

[0019] Additionally, the inside of the lower ring may include retaining means intended to act on a perimeter projection present on a container neck, said retaining means being present partially along the inner diameter of the body of the lower ring.

[0020] Preferably, the retaining means comprise a plurality of protuberances aligned and equidistant from each other, which run parallel to the lower edge of the upper cap.

[0021] Moreover, the closing cap of the invention may include a tamper-evident seal between the upper cap and the lower ring.

[0022] Preferably, the tamper-evident seal is made up of a plurality of break points distributed in a gap existing between the lower edge of the upper cap and the upper edge of the lower ring.

[0023] According to another advantageous aspect of the invention, the closing cap is made of a single piece of injection mouldable or compression moulded plastic material. This cap can leave the moulding area completely finished, such that it does not require subsequent processing, which reduces time and manufacturing costs.

[0024] Thus, the closing cap described represents an innovative structure with structural and constituent features heretofore unknown for its intended purpose, reasons which, taken together with its usefulness, provide it with sufficient grounds for obtaining the requested exclusivity privilege.

[0025] Other features and advantages of the closing cap for containers object of the present invention will be evident in light of the description of a preferred, but not exclusive, embodiment which is illustrated by way of a non-limiting example in the drawings which are attached, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

[0026]

Figure 1 is a perspective view of a first embodiment of the closing cap according to the present invention;
Figure 2 is a side elevation view of the closing cap shown in Figure 1;
Figure 3 is another side elevation view of the closing cap shown in Figure 1;
Figure 4 is a bottom perspective view of the screw-on closing cap shown in Figure 1;
Figure 5 is a perspective view of the closing cap placed on the neck of a container in a closed condition;
Figure 6 is a sequential view that shows different phases of the opening operation of the closing cap on a container;
Figure 7 is a perspective view of a second embodiment of the screw-on closing cap according to the present invention; and
Figure 8 is a perspective view of the closing cap shown in Figure 7 placed on the neck of a container.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0027] In light of the aforementioned figures, and in accordance with the adopted numbering, one may observe therein a preferred exemplary embodiment of the

invention, which comprises the parts and elements indicated and described in detail below.

[0028] Moreover, the terms first, second, third, and the like in the description and in the claims are used to distinguish between similar elements and not necessarily to describe a sequential or chronological order. The terms may be interchanged under appropriate circumstances and the embodiments of the invention may operate in sequences other than those described or illustrated herein.

[0029] Moreover, the terms top, bottom, upper, lower, and the like in the description and in the claims are used for descriptive purposes and not necessarily to describe relative positions.

[0030] As can be seen in the figures, the screw-on closing cap for containers is intended for containers that have an opening in a neck (100) provided with an outer threaded portion. Said cap is made up of a lower ring (1) configured to be coupled to the neck of the container and an upper cap (2) having on the inner face thereof a thread (21) configured to be coupled to the outer threaded portion of a container neck (100), the upper cap (2) and the lower ring (1) being joined together in such a way that they are able to rotate integrally with each other around the neck of the container. This closing cap is made of a single piece of injection mouldable or compression moulded plastic material. It is important to mention that the container neck can have a lower height by using the closing cap described below.

[0031] An outer surface of the lateral face defined by the body of the upper cap (2) has an uneven surface (22), in particular, a knurled surface formed by a plurality of ribs in a radial distribution that extend from the upper portion to the lower portion of the body of the upper cap (2).

[0032] The upper cap (2) and the lower ring (1) are joined by means of two extensions (3) with a certain degree of flexibility and a constant cross section, which are diametrically opposed to each other, each one formed by a thickening (11) in the lower ring that includes a grooved portion (7) such that the extensions are formed above the grooved portion (7), in such a way that the two extensions (3) have the same outer diameter as the outer diameter of the thickening, the lower edge of the body of the upper cap (2) having a step (20) that defines a recessed portion in which the extensions (3) are located, such that in an open position of the closing cap, the upper end of the extensions (3) acts as a hinge region in such a way that the upper cap (2) is able to rotate.

[0033] Additionally, the cap includes stop means intended to fixedly hold the upper cap (2) in an inverted position with respect to the arrangement taken on by the upper cap (2) during the closed position.

[0034] In particular, these stop means comprise a projection (4) that protrudes from the lower ring (1), which is aligned in height with a tab (5) that protrudes laterally from the lower edge of the upper cap (2), such that, in an open condition (Figure 8), the tab abuts a lower surface of the projection (4). It is important to mention that the tab (5) has a surface with a curved path adaptable to the radius of curvature of the lower ring.

[0035] Moreover, a pair of linear openings (9) in the lower ring (1) are provided running parallel to the lower edge of said lower ring (1) and the linear openings (9) are arranged radially and partially underlying the grooved portion (7) and spaced apart from each other. As can be seen, said linear openings (9) are located on each side of the projection (4).

[0036] The inside of the lower ring (1) includes retaining means (described below) which are intended to act on a perimeter projection present on a container neck, said retaining means being present along the inner diameter of the body of the lower ring (1).

[0037] Referring to the aforementioned retaining means, they comprise a plurality of protuberances (8) aligned and equidistant from each other, which run parallel to the lower edge of the upper cap (2).

[0038] In order to assure the user that the container including the closing cap has not been tampered with, the closing cap includes a tamper-evident seal located between the upper cap (2) and the lower ring (1). This seal is made up of a plurality of break points (6) spaced and equidistant from each other located between the lower portion of the upper cap (2) and the upper edge of the lower ring (1).

[0039] Additionally, each of the linear openings includes second tamper-evident seals consisting of breaking bridges (10) located between the upper edge and lower edge of said openings.

[0040] It is important to mention that below the tab (5) and above the projection (4) is a rib (12) that protrudes out of the lower ring (1), which acts as a stop means to favour the retention of the tab (5) on the projection (4) when the upper cap (2) is in a fully open condition.

[0041] In Figures 7 and 8, a second embodiment of the closing cap is shown, the common parts of which have the same reference numbers, wherein the linear openings (9') are located in the lower edge of the lower ring (1), such that they are open at the bottom unlike the embodiment described above. In this case, the linear openings (9') do not have second tamper-evident seals as they are open at the bottom, in other words, free of material from the lower ring.

[0042] The details, shapes, dimensions and other accessory elements, used to manufacture the closing cap of the invention, may be suitably substituted for others which do not depart from the scope defined by the claims which are included below.

Claims

1. A screw-on closing cap for containers, in particular caps intended for containers that have an opening in a neck provided with an outer threaded portion, comprising a lower ring configured to be coupled to

the neck of the container and an upper cap (2) having on the inner face thereof a thread configured to be coupled to the outer threaded portion of a container neck, the upper cap (2) and the lower ring (1) being joined together in such a way that they are able to rotate integrally with each other, joining the upper cap (2) and the lower ring (1) by means of two extensions (3) with a certain degree of flexibility that are diametrically opposed to each other, each one formed by a thickening in the lower ring that includes a grooved portion (7) such that the extensions are formed above the grooved portion, in such a way that the two extensions have the same outer diameter as the outer diameter of the thickening, the lower edge of the body of the upper cap having a step that defines a recessed portion in which the extensions are located, such that in a closed condition the two extensions (3) are arranged above and parallel to the body of the lower ring (1), while in an open position of the closing cap, the upper end of the extensions (3) acts as a hinge region in such a way that the upper cap (2) is able to rotate, **characterised in that** linear openings in the lower ring (1) are provided running parallel to the lower edge of said lower ring (1) and the linear openings are arranged radially and at least partially underlying the grooved portion (7) and spaced apart from each other.

2. The screw-on closing cap according to claim 1, **characterised in that** it includes stop means intended to fixedly hold the upper cap (2) in an inverted position with respect to the arrangement taken on by the upper cap (2) during the closed position.

3. The screw-on closing cap for containers according to claim 2, **characterised in that** the stop means comprise a projection (4) that protrudes from the lower ring (1), which is aligned in height with a tab (5) that protrudes laterally from the lower edge of the upper cap (2), such that, in an open condition, the tab abuts an upper surface of the projection (4), in which the tab (5) has a curved path adaptable to the radius of curvature of the lower ring.

4. The screw-on closing cap for containers according to any of the preceding claims, **characterised in that** the inside of the lower ring (1) includes retaining means intended to act on a perimeter projection present on a container neck, said retaining means being present along the inner diameter of the body of the lower ring (1).

5. The screw-on closing cap for containers according to claim 4, **characterised in that** the retaining means comprise a plurality of protuberances aligned and equidistant from each other, which run parallel to the lower edge of the upper cap.

6. The screw-on closing cap for containers according to any of the preceding claims, **characterised in that** the linear openings include second tamper-evident seals.

7. The screw-on closing cap for containers according to claim 6, **characterised in that** the second tamper-evident seals consist of breaking bridges located between the upper edge and lower edge of said openings.

8. The screw-on closing cap for containers according to any of the preceding claims, **characterised in that** the linear openings (9') are located in a lower edge of the lower ring (1), such that they are open at the bottom.

9. The screw-on closing cap according to any of the preceding claims, **characterised in that** it is made of a single piece of injection mouldable or compression moulded plastic material.

10. A beverage container, comprising a bottle-shaped body that includes a threaded neck at the top, **characterised in that** it includes a screw-on closing cap according to any of claims 1 to 9 coupled to the threaded neck.

FIG. 1

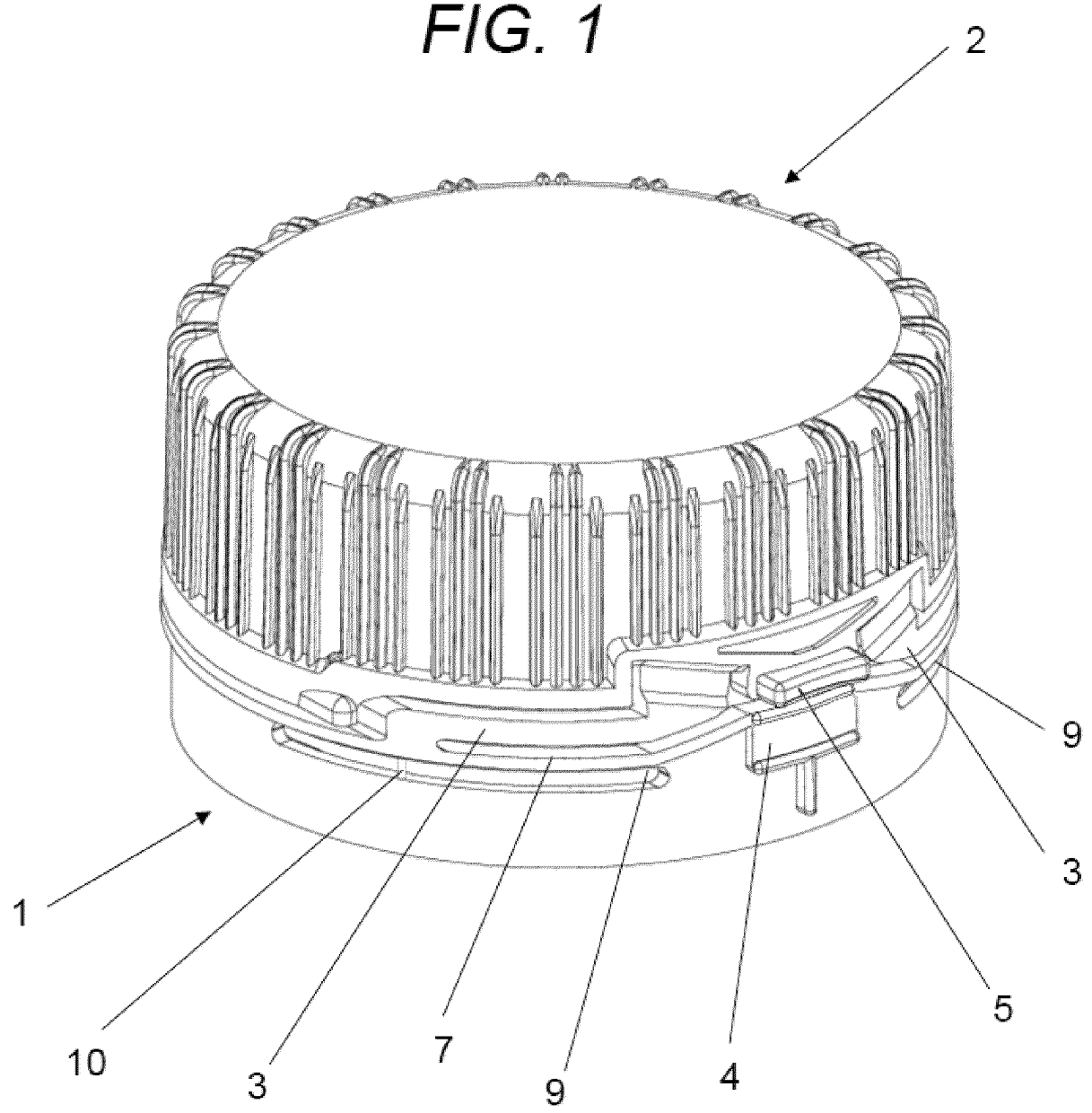


FIG. 2

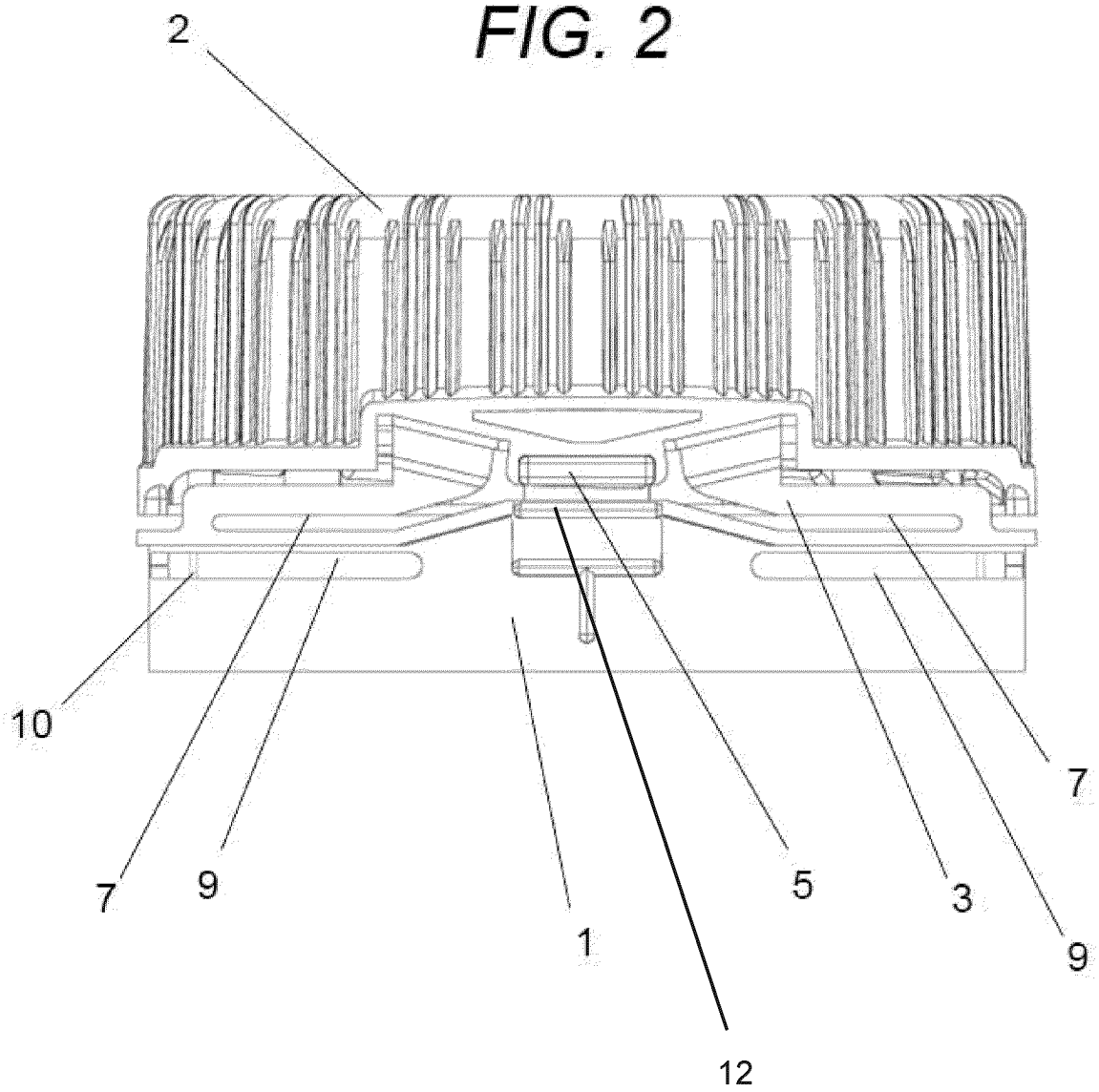


FIG. 3

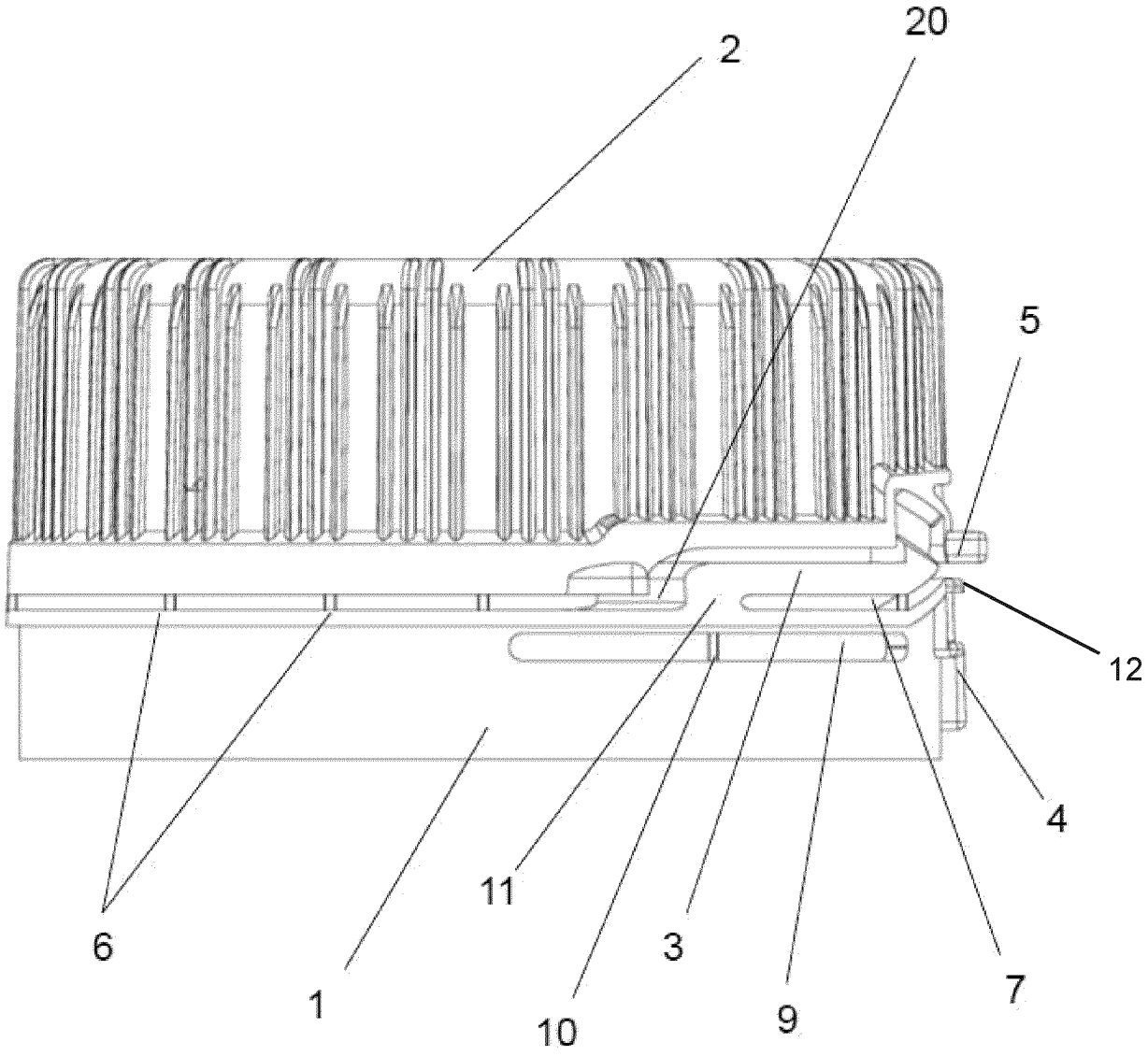


FIG. 4

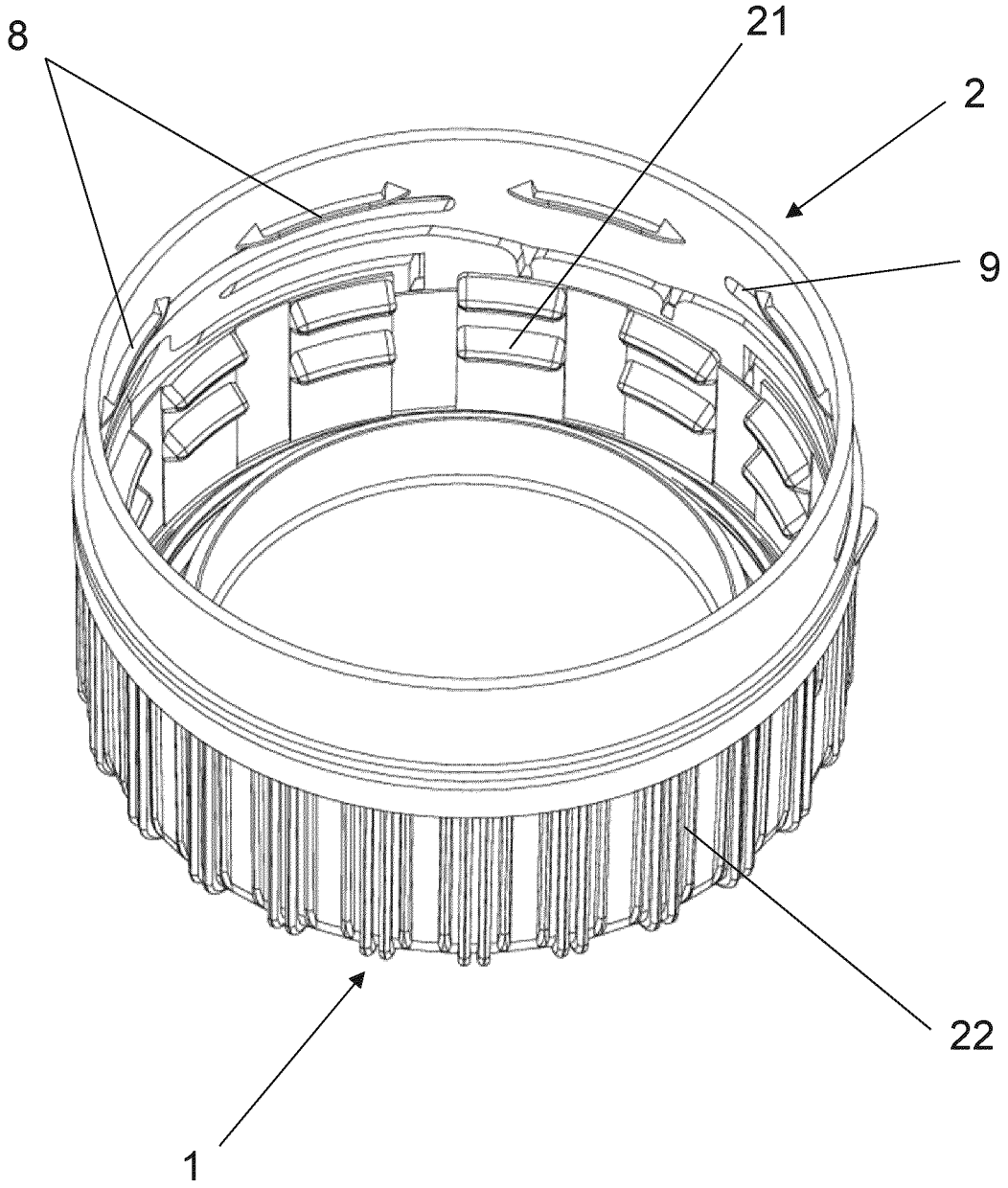


FIG. 5

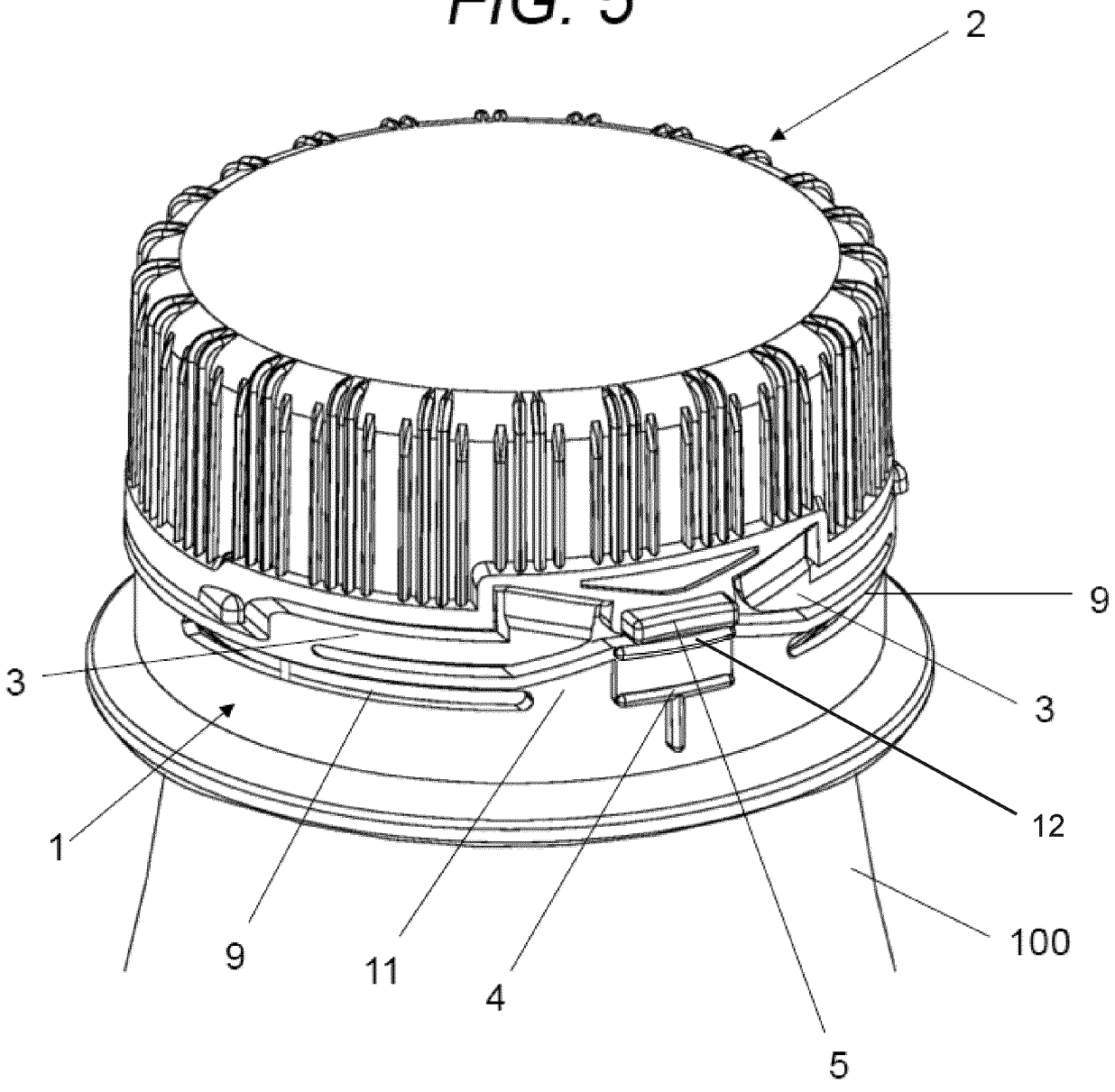


FIG. 6

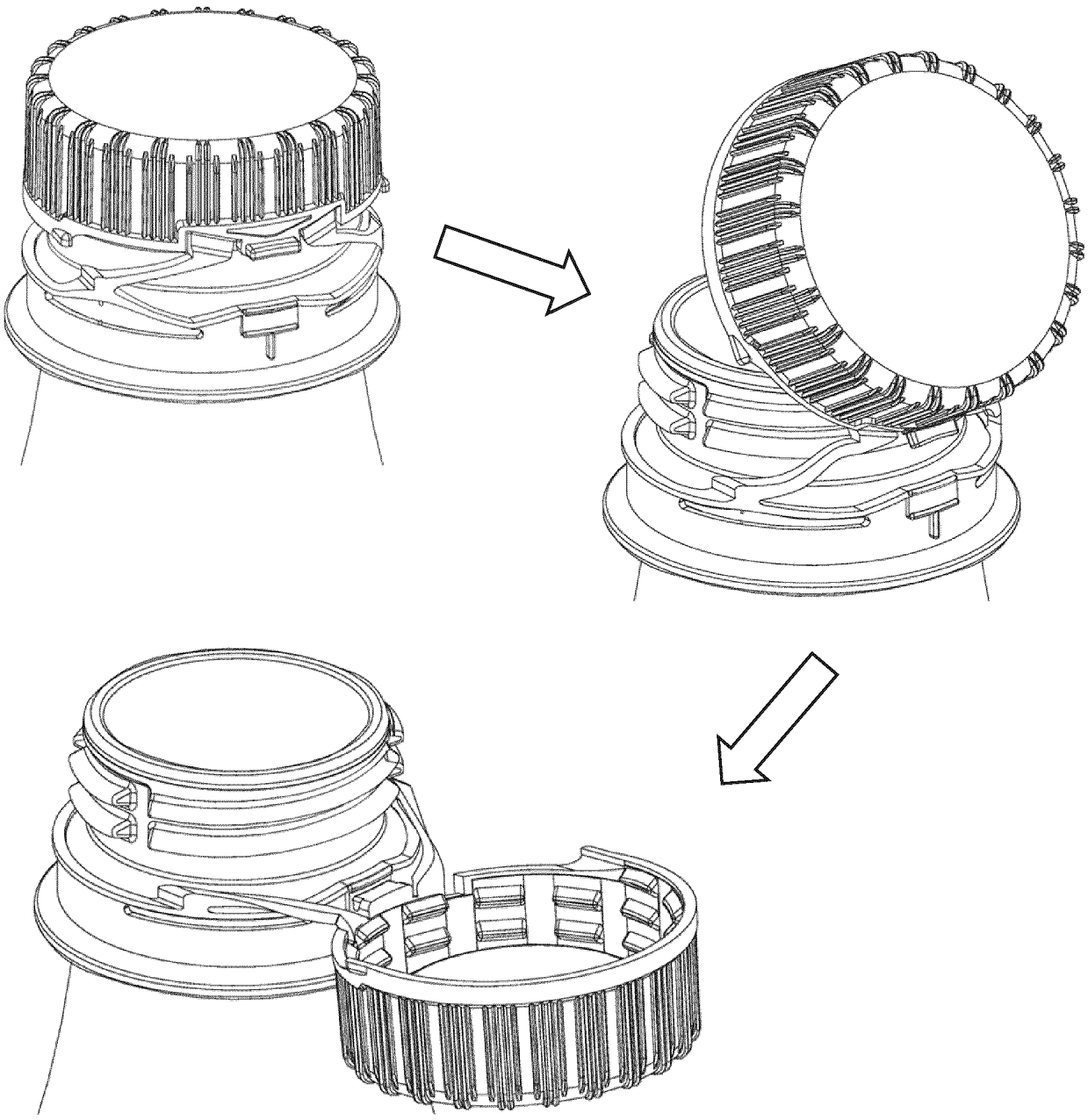


FIG. 7

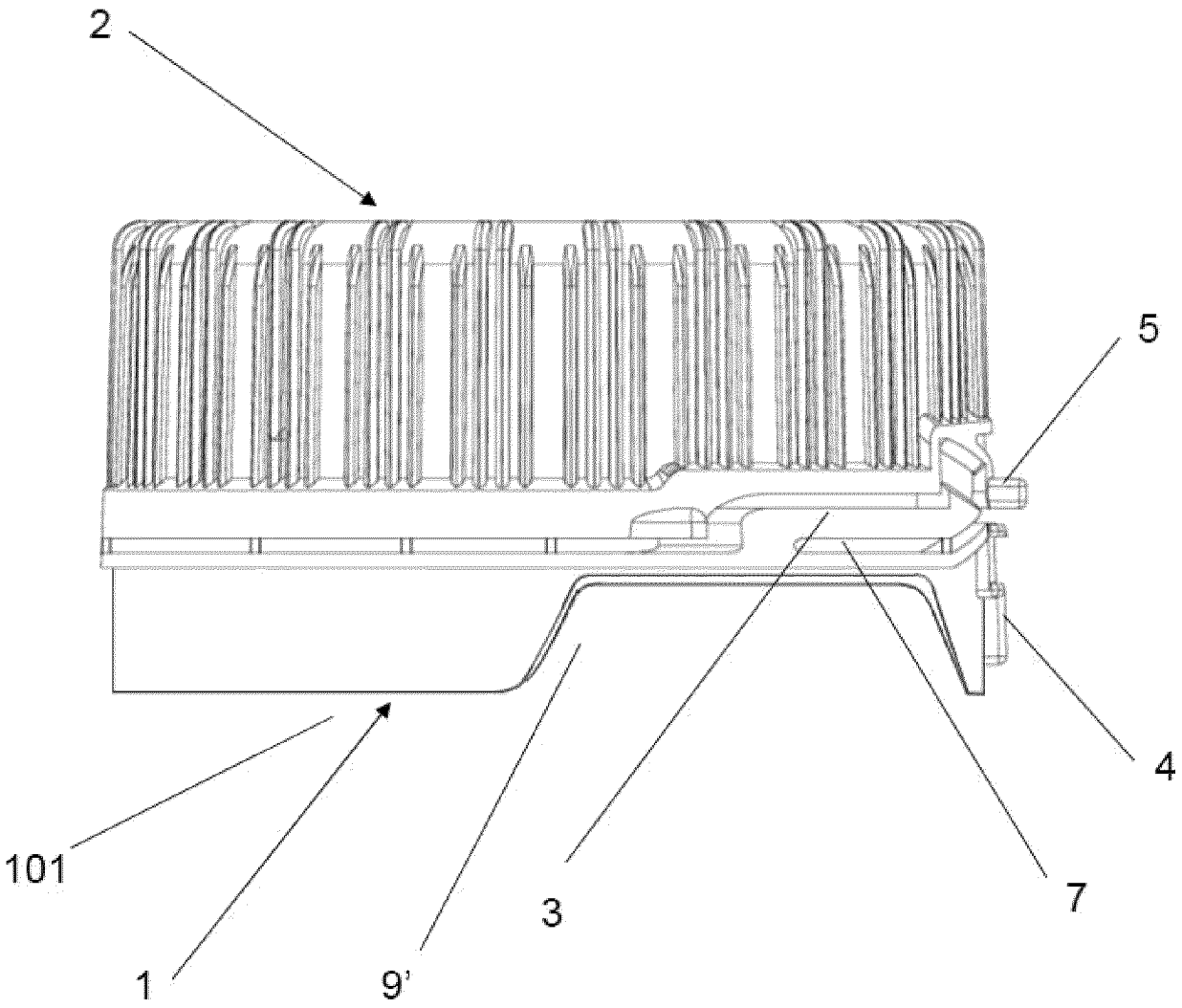
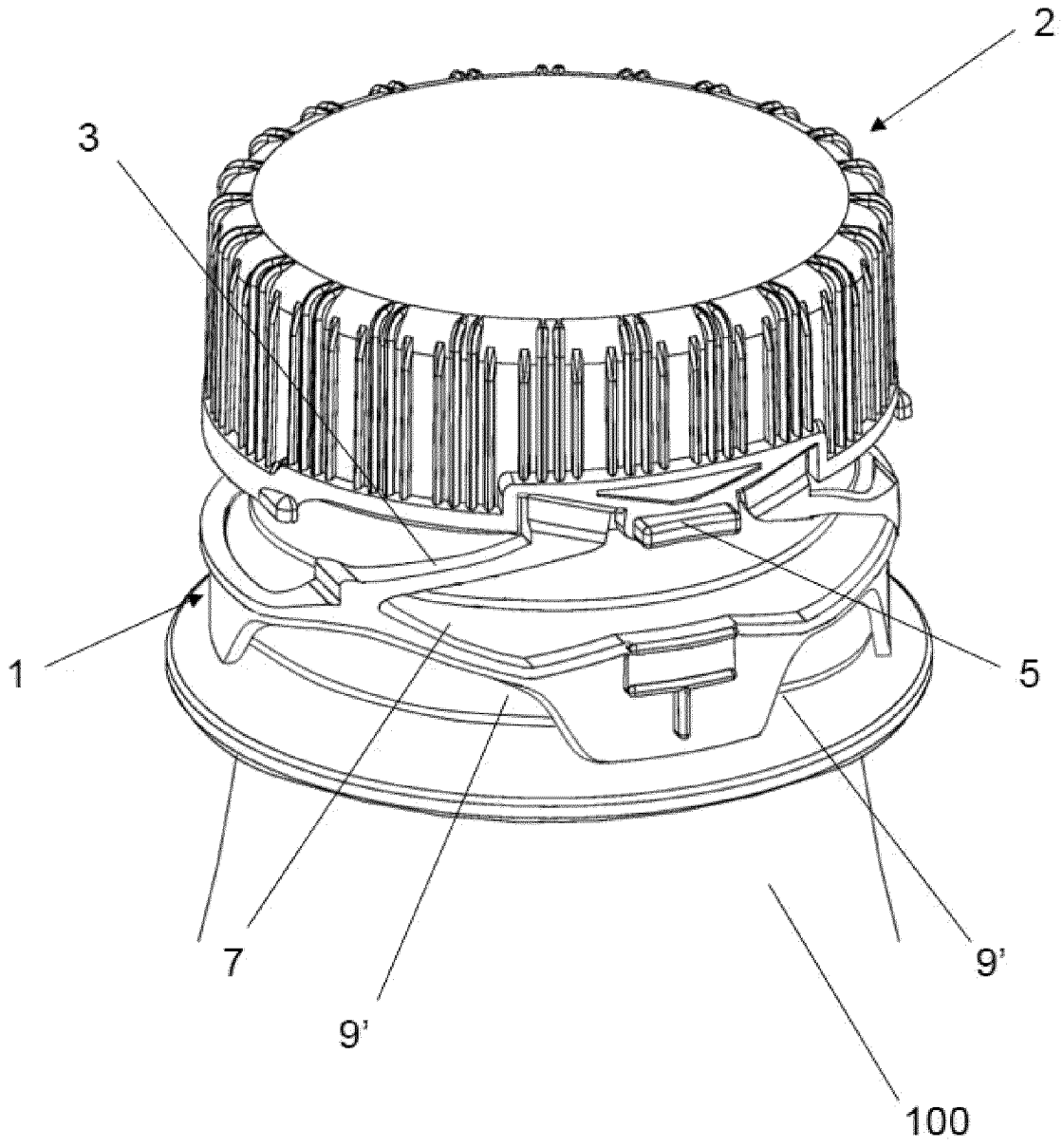


FIG. 8



INTERNATIONAL SEARCH REPORT

International application No
PCT/ES2022/070545

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D55/16
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	WO 2020/166547 A1 (NIPPON CLOSURES CO LTD [JP]) 20 August 2020 (2020-08-20) figures 1, 2, 5	1
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A	IT 2019 0000 1383 A1 (SACMI [IT]) 30 July 2020 (2020-07-30) figures 2, 3	1-10

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
25 January 2023	03/02/2023

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Dominois, Hugo

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INTERNATIONAL SEARCH REPORT

International application No
PCT/ES2022/070545

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/ES2022/070545

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ES 1237189 U	08-11-2019	NONE	

Form PCT/ISA/210 (patent family annex) (April 2005)

REFERENCES CITED IN THE DESCRIPTION

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- ES 1247151 **[0004]**
- ES 1237189 **[0004]**