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(54) **ASSEMBLY INCLUDING A CONTAINER AND A CAPPING DEVICE PERMANENTLY SECURED ON THE NECK OF THE CONTAINER**

(57) The invention relates to an assembly comprising - a container (1) made of blow-molded plastic material and including a neck (2) comprising a dispensing orifice (5), a support collar (6), a coupling washer arranged between the support collar (6) and the dispensing orifice (5), a cylindrical part (8) arranged axially between the support collar (6) and the coupling washer; and - a capping device comprising a lower ring that is retained between the coupling washer and the support collar and that cooperates with the cylindrical part, a cap, a linking device that joins the cap to the lower ring in which the cylindrical part (8) has an inside diameter between 24 and 28 mm, an outside diameter between 25.6 and 30.4 mm and a height between 2.70 and 3 mm.

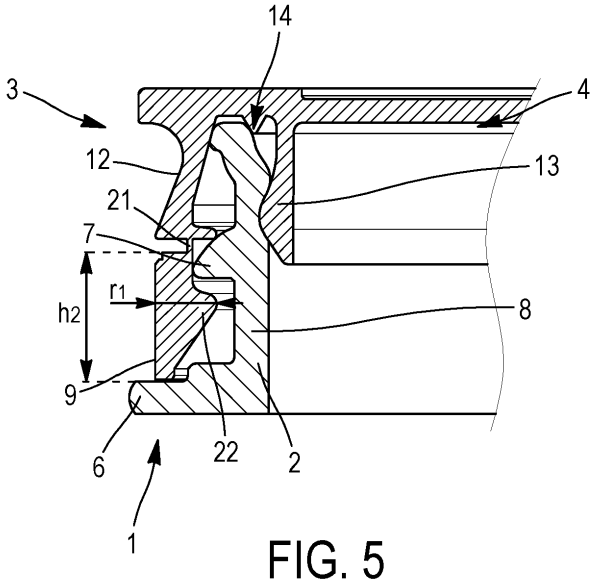

FIG. 5

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Description

Technical field

[0001] The invention relates to an assembly comprising a container and a capping device that is equipped with a cap and allows said cap to be kept fixed to the neck of the container, thus avoiding loss of the cap in nature.

Technological background

[0002] In the state of the art are known assemblies that include a container and a capping device that includes a cap and that allows the cap to be kept attached to the neck of the container. Such an assembly is described, for example, in document US2018086510 in the name of this applicant.

[0003] The container includes a neck that is equipped with a dispensing orifice that allows the contents of the container to be poured, a support collar that protrudes radially relative to the axis of the neck, and a coupling washer that protrudes radially relative to the axis of the neck, and It is arranged between the support collar and the dispensing orifice. The capping device includes a lower ring that is intended to be retained in the neck of the container, a cap that is intended to cover the orifice of the container so as to seal it, and an attachment device that attaches the cap to the lower ring.

[0004] The lower ring is held axially on the neck of the container by means of a coupling washer. To do this, the coupling washer has a frusto-conical shape that tapers upwards, that is to say in the direction of the orifice in the container. The coupling washer delimits, downwards, that is to say in a direction opposite to the orifice, a stop. The lower ring includes radially inward projecting retaining elements. During assembly of the capping device on the neck of the container, the retaining elements slide against the frusto-conical surface of the coupling washer and subsequently interlock by elastic recovery behind the coupling washer. The lower ring is then retained between the coupling washer and the support collar.

[0005] Such a capping device is not entirely satisfactory.

[0006] In particular, the pull-out resistance of the lower ring is limited and consequently it does not allow, it cannot be guaranteed in a sufficiently reliable manner, that the cap remains permanently attached to the container

[0007] Furthermore, if the diameter of the neck of the container is limited in such a way as to limit the amount of material used for manufacturing the container, this restricted diameter leads to difficulties during the container blowing.

Summary

[0008] An idea on the basis of the invention is to propose an assembly that comprises a blow-molded container that is easier to make and that allows an increase in the tear resistance of the capping device intended to be permanently attached to the neck of the container and this without significantly increasing the weight of the container.

[0009] According to an embodiment, the invention provides an assembly comprising a blow-molded plastic container and that comprises a neck in turn comprising:

- a dispensing orifice;
- a support collar;
- a coupling washer arranged between the support collar and the dispensing orifice;
- a cylindrical part arranged axially between the support collar and the coupling washer; and
- a capping device comprising:
- a lower ring that is retained between the coupling washer and the support collar and that cooperates with the cylindrical part;
- a cap comprising an upper wall intended to be arranged opposite the orifice in the neck;
- a attachment device that attaches the cap to the lower ring;
- the assembly being remarkable because the cylindrical portion has an inside diameter comprised between 24 and 28 mm, an outside diameter comprised between 25.6 and 30.4 mm and a height comprised between 2.70 and 3 mm.

[0010] In this way, the neck has such dimensions that it is possible to use a lower ring with a larger section, in order to increase its pull-out resistance and without thereby considerably increasing the weight of the neck.

[0011] Furthermore, the neck has an internal diameter d1 which is advantageous because, on the one hand, it is large enough to allow a sufficient air flow to optimize blowing operations and, on the other hand, it is sufficiently reliable to limit the amount of material used for the manufacture of the neck.

[0012] According to other advantageous embodiments, such a capping device may have one or more of the following features.

[0013] According to one embodiment, the internal diameter of the cylindrical part is comprised between 25 and 27 mm, preferably between 25.5 and 26 mm and for example of the order of 25.70 mm.

[0014] According to one embodiment, the outer diameter of the cylindrical part is comprised between 27 and 29 mm, preferably between 27.5 and 28 mm and for example of the order of 27.7 mm.

[0015] According to one embodiment, the height of the cylindrical part is comprised between 2.80 and 2.90 mm, for example of the order of 2.87 mm.

[0016] According to one embodiment, the cylindrical part comprises a thickness comprised between 0.8 and 1.2 mm, for example of the order of 1 mm.

[0017] According to one embodiment, the neck has a weight comprised between 1.3 and 1.7 g, for example of

the order of 1.4 g.

[0018] According to one embodiment, the lower ring has a height comprised between 3.36 and 3.66 mm for more than 50% of its periphery, for example of the order of 3.51 mm.

[0019] According to one embodiment, the cap comprises an external flap which, in a closed position of the cap, surrounds the neck of the container, the external flap comprising a downwardly projecting lug and having on an internal surface a projecting surface which, when the cap is in the closed position, it becomes interlocked by elastic recovery behind the coupling washer, the lower ring comprising a cutout in which the lug of the cap protrudes.

[0020] According to one embodiment, the lower ring has, in the area equipped with the cutout, a height comprised between 1.76 and 2.16 mm, for example of the order of 1.91 mm.

[0021] According to one embodiment, the coupling washer has a frusto-conical surface that tapers upwards and the lower ring comprises retaining elements that protrude radially inwardly and are configured to, during assembly of the capping device on the neck, slide against the frusto-conical surface of the coupling washer and subsequently interlock by elastic recovery behind the coupling washer.

[0022] According to one embodiment, the retaining elements are protrusions that protrude radially inwardly from the lower ring.

[0023] According to an embodiment, the lower ring has, at the height of the protrusions, a maximum radial dimension comprised between 1.68 and 1.98 mm, for example, of the order of 1.83 mm.

[0024] According to an embodiment, the joining device includes two resilient films that attach the outer peripheral flap and the second sector, the capping device also including a locking device configured to lock the cap in the tilted open position.

[0025] According to one embodiment, the locking device includes a tab arranged between the two resilient films and extending upward from the lower ring and a heel that projects radially outward from the outer peripheral flap, the heel being arranged to abut against the tab during the pivoting of the cap between a closed position and an open tilted position, the resilient films, the tab and the heel being configured in such a way that, during the pivoting movement of the cap between its closed position and its position tilted open, the resilient films are subjected to a tensile force that increases to an intermediate unstable position and subsequently decreases from said intermediate unstable position towards the open tilted position.

Brief description of the figures

[0026] The invention will be better understood and other objects, details, features and advantages thereof will emerge more clearly in the course of the following description of various particular embodiments of the invention, given solely by way of illustration and not limitation, with reference to the attached drawings.

- **Figure 1** is a perspective view of a capping device.
- **Figure** 2 is a front view of the capping device of Figure 1.
- **Figure** 3 is a view from behind of the capping device of Figures 1 and 2.
- **Figure** 4 is a perspective view of a neck designed to receive the capping device of Figures 1 to 3
- **Figure** 5 is a partial sectional view of the capping device of Figures 1 to 3 mounted on the neck of Figure 4.
- **Figure** 6 is a sectional view of the neck of Figures 4 and 5.

Detailed description of embodiments

[0027] In the description and the figures, the axis X corresponds to the axis of revolution of the container. By convention, the "radial" orientation is directed orthogonal to the axis X. The terms "external" and "internal" are used to define the relative position of one element in relation to another, by reference to the axis X, an element close to the axis X is rated as well as internal as opposed to an external element located radially on the periphery. The terms "upper" and "lower" are used to define the relative position of one element in relation to another by reference to a position in which the orifice in the neck is directed upwards and the cap is in a closed position on the neck of the container, an element intended to be placed lower is designated by lower and an element intended to be positioned higher is designated by upper.

[0028] With reference to Figures 1 to 6, an assembly comprising a container 1 equipped with a neck 2 and a capping device 3 equipped with a cap 4 intended to cover the orifice of the container 1 so as to seal it will be described below.

[0029] Container 1 is for example a bottle. For example, the bottle has a capacity of 150 cl. The container 1 is made of plastic material and is shaped by a blow molding process. In known manner, such a manufacturing process includes a first stage during which a tubular preform having an orifice is made and a second stage during which the preform is placed in a blow mold and a compressed gas is injected into the interior of the tubular preform through said orifice in the preform so that the material stretches and becomes flat against the mold so that it takes the shape of said mold.

[0030] As shown in Figures 5 and 6, the neck 2 of the container 1 includes an upper end in which a dispensing orifice 5 is arranged that allows the contents of the con-

tainer 1 to be poured. The neck 2 of the container 1 includes a support collar 6 projecting radially outward and a coupling washer 7 projecting also radially outward and which is arranged axially between the support collar 6 and dispensing orifice 5. A cylindrical part 8 is arranged axially between the support collar 6 and the dispensing orifice 5. The coupling washer 7 has a frusto-conical shape that tapers upwards, that is to say in the direction of the dispensing orifice 5 of the container 1. The coupling washer 7 delimits downward, that is to say in a direction opposite to the dispensing orifice 5, a stop.

[0031] The capping device 3, mainly represented in Figures 1 to 3, includes a lower ring 9 that is retained in the neck 2 of the container 1, a cap 4 that is intended to cover the dispensing orifice 5 of the container 1 so that seals it and a attachment device 10 that attaches the cap 4 to the lower ring 9.

[0032] As shown in Figure 5, the cap 4 includes an upper wall 11 intended to be arranged orthogonally to the axis X opposite the dispensing orifice 5 of the neck 2, an outer peripheral flap 12 intended to surround the neck 2 of the container 1 and a internal flap 13 which, in the closed position of the cap 4, is inserted inside the dispensing orifice 5. The outer peripheral flap 12 and the inner flap 13 project downwardly from the upper wall 11. The cap 4 also includes an annular lip 14 that extends from the upper wall 11, radially between the outer peripheral flap 12 and the inner flap 13. When the cap 4 is in the closed position, the annular lip 14 and the inner flap 13 are in contact against the inner face of the neck 2 so as to ensure the sealing of the closure.

[0033] The cap 4 also includes a gripping rim 15, shown in Figures 1 and 2, which projects radially outward. The gripping rim 15 is advantageously arranged on the opposite side of the attachment device 10. The gripping rim 15 thus forms a gripping surface intended to facilitate the visibility, interpretation and manipulation of the cap 4, mainly for the purpose of pivoting it to the tilted open position.

[0034] As shown in Figure 2, the cap 4 further includes a lug 16 arranged in an area diametrically opposite to the attachment device 10. The lug 16 protrudes downwardly from the lower flange of the outer peripheral flap 12 into a cut-out 17 arranged in the lower ring 9. The lug 16 comprises, on its internal surface, a projecting surface which, when the cap 4 is in the closed position, becomes interlocked, by elastic extension behind the support provided by the coupling washer 7.

[0035] The attachment device 10 is configured to allow the cap 4 to pivot between a closed position, shown in Figures 1, 2, 3 and 5, and a tilted open position, not shown, in which the cap 4 disengages from the dispensing orifice 5 and does not hinder the pouring of the contents of the container 1. As shown in figure 3, the attachment device 10 includes two resilient films 18 that attach the cap 4 and more particularly the outer peripheral flap 12 of the cap 4 to the lower ring 9.

[0036] The capping device 3 also includes a locking device, also shown in figure 3, arranged to lock the cap 4 in the tilted open position. The locking device includes a tab 19 that extends upwardly from the upper edge of the lower ring 9. The tab 19 is arranged between the two resilient films 18. The locking device further includes a heel 20 that protrudes radially toward the outer, from the outer peripheral flap 12 of the cap 4. The heel 20 is configured to abut against the tab 19 when the cap 4 is pivoted towards the tilted open position so as to lock the cap 4 in said tilted open position. The resilient films 18, as well as the locking device are configured in such a way that, during a first part of the movement of the cap 4 from the released position towards the tilted open position, the two resilient films 18 are subjected, due to the support of the heel 20 on the tab 19, to a tensile force that increases to an intermediate unstable position and subsequently decreases from said intermediate unstable position to the tilted open position. This allows the cap 4 to be locked in the tilted open position.

[0037] Advantageously, the lower ring 9 is attached, before the first opening of the container 1, to the cap 4 by means of breakable bridges 21, visible in Figures 2, 3 and 5, intended to break during the opening of the cap 4. These breakable bridges 21 thus constitute evidence of inviolability. More particularly, the breakable bridges 21 are distributed around the axis X and join the upper edge of the lower ring 9 and the lower edge of the outer peripheral flap 12.

[0038] On the other hand, the lower ring 9 includes retaining elements 22, as shown in FIG. 5, which makes it possible to retain the lower ring 9 on the neck 2. In the embodiment shown, the retaining elements 22 are protrusions projecting radially inward from the lower ring 9. The protrusions have a radial dimension that increases from bottom to top, that is to say in the direction of the upper edge of the lower ring 9. During the assembly of the capping device 3 on the neck 2 of the container 1, the protrusions slide against the frusto-conical surface of the coupling washer 7 until it passes the lower end of the coupling washer 7 and subsequently they interlock, by elastic recovery, behind the support. The lower ring 9 is thus axially immobilized on the neck 2 while it can rotate relative to it about the axis X. During this assembly, the lower ring 9 comes into abutment against the support collar 6, which makes it possible to protect breakable bridges 21.

[0039] In relation to Figure 6, the dimensions of the neck 2 are described below. The internal diameter of the neck 2 has its smallest dimension at the height of its cylindrical part 8 arranged axially between the coupling washer 7 and the support collar 6 The cylindrical part 8 has an internal diameter d1 comprised between 24 and 28 mm, advantageously between 25 and 27 mm, preferably between 25.5 and 26 mm and for example of the order of 25.70 mm. Such an internal diameter d1 is advantageous because, on the one hand, it is large enough to allow a sufficient air flow during blowing operations and, on the other hand, it is sufficiently small to limit the

amount of material used to manufacture the neck 2.

[0040] The thickness of the wall of the cylindrical part 8 of the neck 2 is comprised between 0.8 and 1.2 mm and preferably of the order of 1 mm. Also, the outer diameter d2 of the cylindrical part 8 is comprised between 25.6 mm and 30.4 mm, advantageously between 27 and 29 mm, preferably between 27.5 and 28 mm and for example of the order of 27.7 mm.

[0041] On the other hand, the cylindrical part 8 arranged between the coupling washer 7 has a height comprised between 2.70 and 3 mm, advantageously between 2.80 and 2.90 mm, for example of the order of 2.87 mm. This makes it possible to use a lower ring 9 having a larger section in order to increase its pull-out resistance and this without increasing the weight of the neck 2 too considerably.

[0042] Advantageously, the weight of such a neck 2 is comprised between 1.3 and 1.7 g, for example of the order of 1.5 g, the neck 2 of the container 1 being defined as consisting of the cylindrical upper part of container 1 as shown in figures 4 and 6.

[0043] In relation to Figures 2 and 5, the dimensions of the lower ring 9 are described below. Beyond the area of the attachment device 10 and the cut-out 16, the lower ring 9 has a height h2 comprised between 3.36 and 3.66 mm, for example, of the order of 3.51 mm. On the other hand, the lower ring 9 has a thickness of at least between 0.5 and 0.6 mm, for example of the order of 0.55 mm.

[0044] In the area of the lower ring 9 that has the cutout 16, the lower ring 9 has a height h3 comprised between 1.76 and 2.16 mm, for example of the order of 1.91 mm.

[0045] The lower ring 9 has, at the height of the protrusions that form the retaining elements 22, a maximum radial dimension r1 comprised between 1.68 and 1.98 mm, for example, of the order of 1.83 mm.

[0046] Although the invention has been described in connection with several particular embodiments, it is of course evident that it is in no way limited and that it encompasses all technical equivalences of the means described, as well as their combinations if they fall within the framework of the invention as defined by the claims.

[0047] The use of the verbs "consist", "understand" or "include" and their conjugated forms does not exclude the presence of other elements or of other stages than those stated in the claim.

[0048] In the claims, any reference signs in parentheses should not be construed as limiting the claim.

Claims

1. An assembly comprising:

- a container (1) made of blow-molded plastic material and including a neck (2) comprising:
  - a dispensing orifice (5);
  - a support collar (6);
  - a coupling washer arranged between the support collar (6) and the dispensing orifice (5);
  - a cylindrical part (8) arranged axially between the support collar (6) and the coupling washer; and
- a capping device (3) comprising:
  - a lower ring (9) that is retained between the coupling washer and the support collar (6) and that cooperates with the cylindrical part (8);
  - a cap (4) including an upper wall intended to be arranged opposite the dispensing orifice (5) of the neck (2);
  - a attachment device (10) that joins the cap (4) to the lower ring (9);

the assembly being **characterized in that** the cylindrical part (8) has an inner diameter comprised between 24 and 28 mm, an outer diameter comprised between 25.6 and 30.4 mm and a height comprised between 2.70 and 3 mm.

2. Assembly according to claim 1, wherein the inner diameter of the cylindrical part (8) is comprised between 25 and 27 mm.

3. Assembly according to claim 1 o 2, wherein the outer diameter of the cylindrical part (8) is comprised between 27 and 29 mm.

4. Assembly according to any one of claims 1 to 3, wherein the height of the cylindrical part (8) is comprised between 2.80 and 2.90 mm.

5. Assembly according to any one of claims 1 to 4, wherein the cylindrical part (8) has a thickness comprised between 0.8 and 1.2 mm.

6. Assembly according to any one of claims 1 to 5, wherein the neck (2) has a weight comprised between 1.3 and 1.7 g.

7. Assembly according to any one of claims 1 to 6, wherein the lower ring (9) has a height of between 3.36 and 3.66 mm over more than 50% of its periphery.

8. Assembly according to any one of claims 1 to 7, wherein the cap (4) includes an outer flap which is in a closed position of the cap (4) around the neck (2) of the container (1), the outer flap including a lug (16) that protrudes downward and has on an internal surface a projecting surface which, when the cap (4) is in the closed position, becomes interlocked by elastic recovery behind the coupling washer (7), in-

cluding the ring bottom (9) a cutout in which the lug (16) of the cap (4) protrudes.

9. Assembly according to claim 8, wherein the lower ring (9) has, in the area equipped with the cutout, a height between 1.76 and 2.16 mm.

10. Assembly according to any one of claims 1 to 9, wherein the coupling washer (7) has a frusto-conical surface that tapers upwards and in which the lower ring (9) includes retaining elements (22) that project radially inward and which are configured to slide against the frusto-conical surface of the coupling washer (7) during assembly of the capping device (3) on the neck (2) and subsequently interlock by elastic recovery behind the coupling washer (7).

11. Assembly according to any one of claims 1 to 10, wherein the retaining elements (22) are protrusions that project radially inward from the lower ring (9).

12. Assembly according to claim 11, wherein the lower ring (9) has, at the height of the protrusions, a maximum radial dimension comprised between 1.68 and 1.98 mm.

13. Assembly according to any one of claims 1 to 12, wherein the attachment device (10) includes two resilient films (18) that link the outer peripheral flap (12) and the second sector, including the capping device (3) in addition a locking device configured to lock the cap (4) in the tilted open position.

14. Assembly according to claim 13, wherein the locking device includes a tab (19) arranged between the two resilient films (18) and extending upward from the lower ring (9) and a heel (20) projecting radially outward from the outer peripheral flap (12), the heel (20) being arranged to abut against the tab (19) during the pivoting of the cap (4) between a closed position and a tilted open position, the resilient films (18), the tab (19) and the heel (20) being configured in such a way that, during the pivoting movement of the cap (4) between its closed position and its tilted open position, the resilient films (18) are subjected to a tensile force that increases to an intermediate unstable position and subsequently decreases from said intermediate unstable position towards the tilted open position.

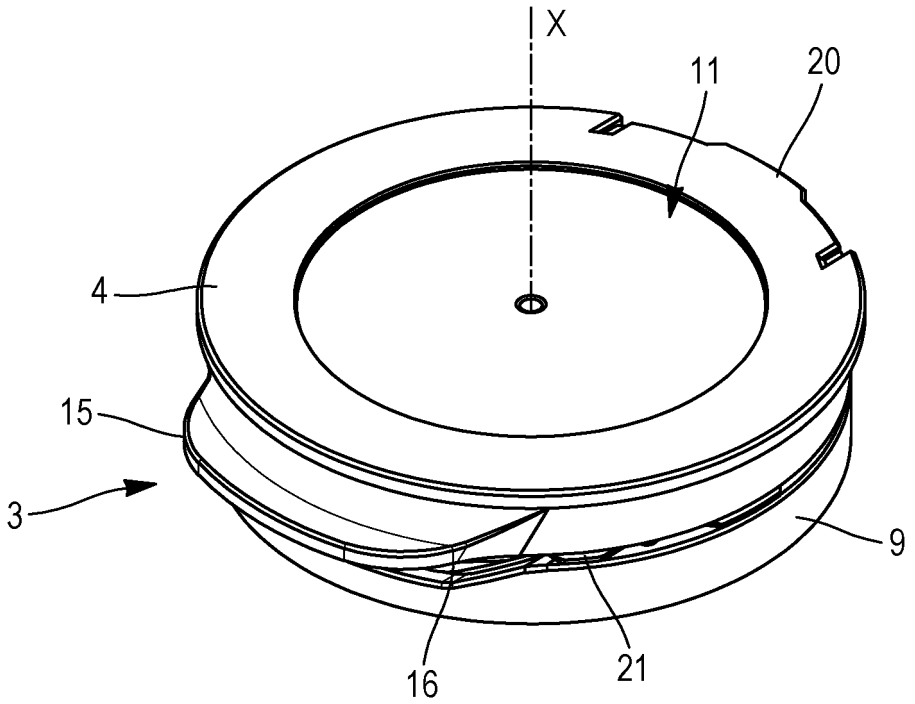

FIG. 1

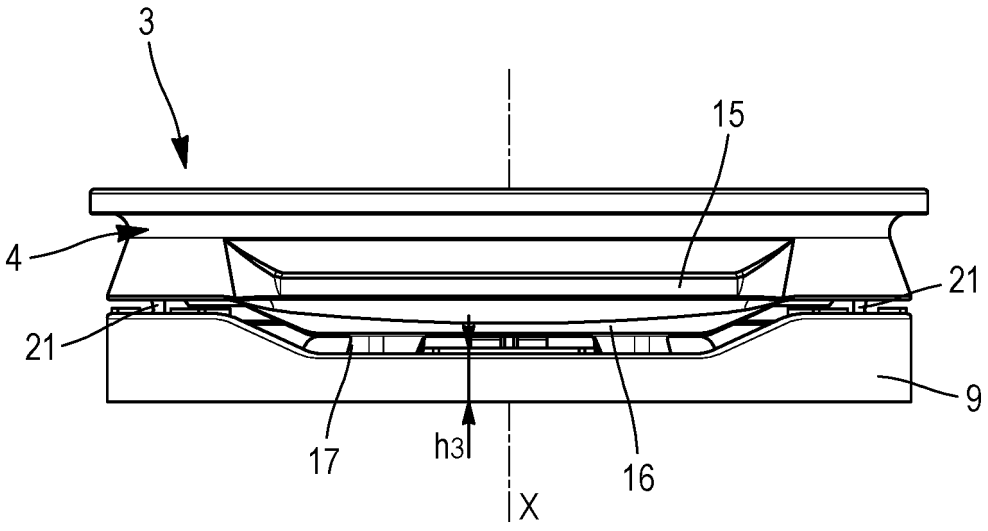

FIG. 2

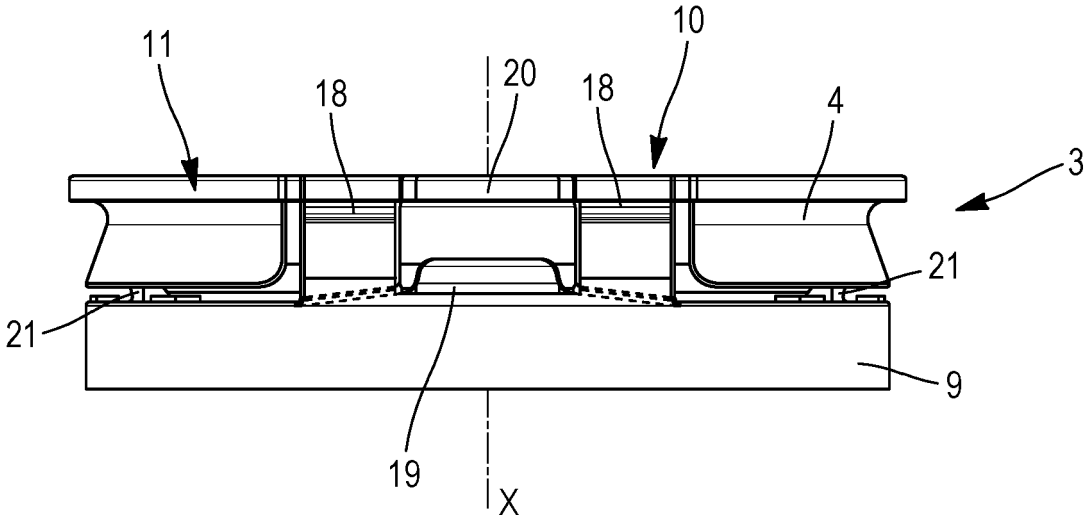

FIG. 3

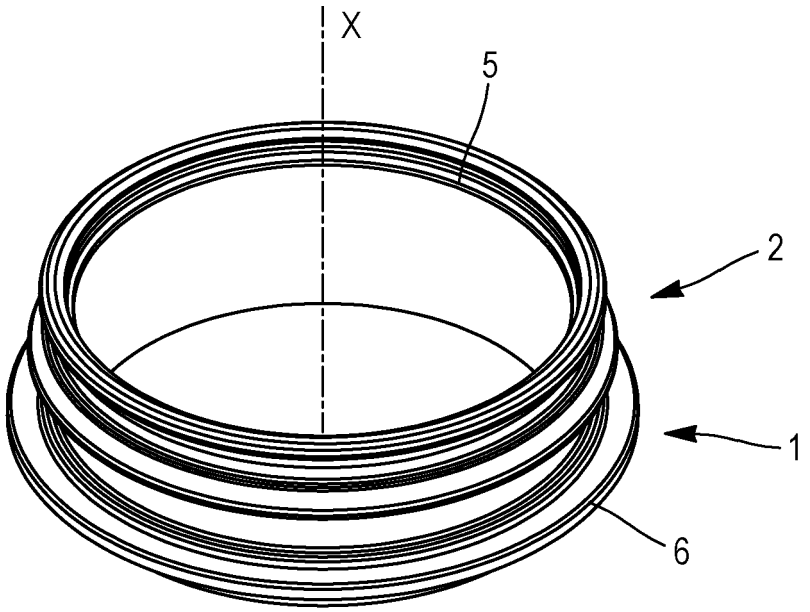

FIG. 4

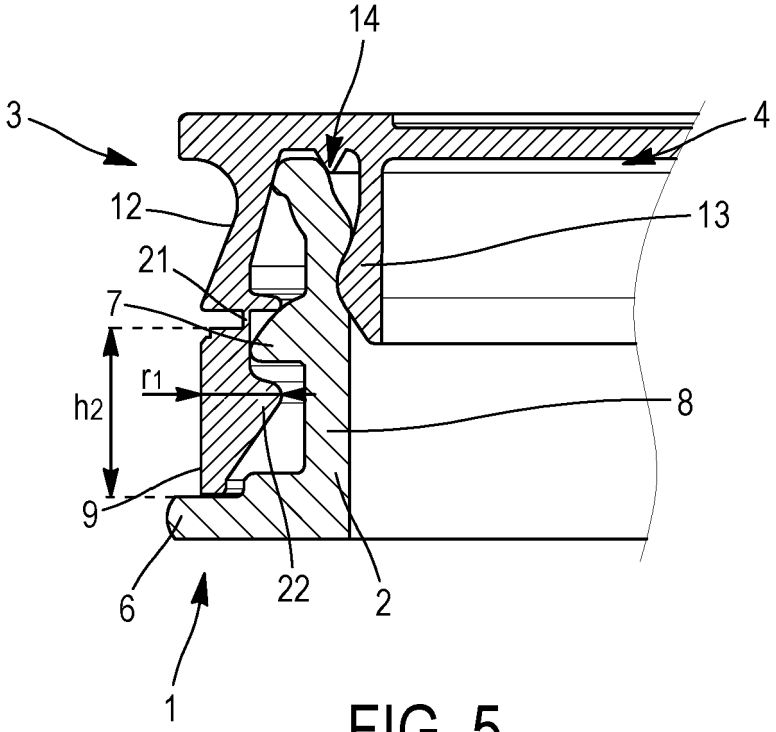

FIG. 5

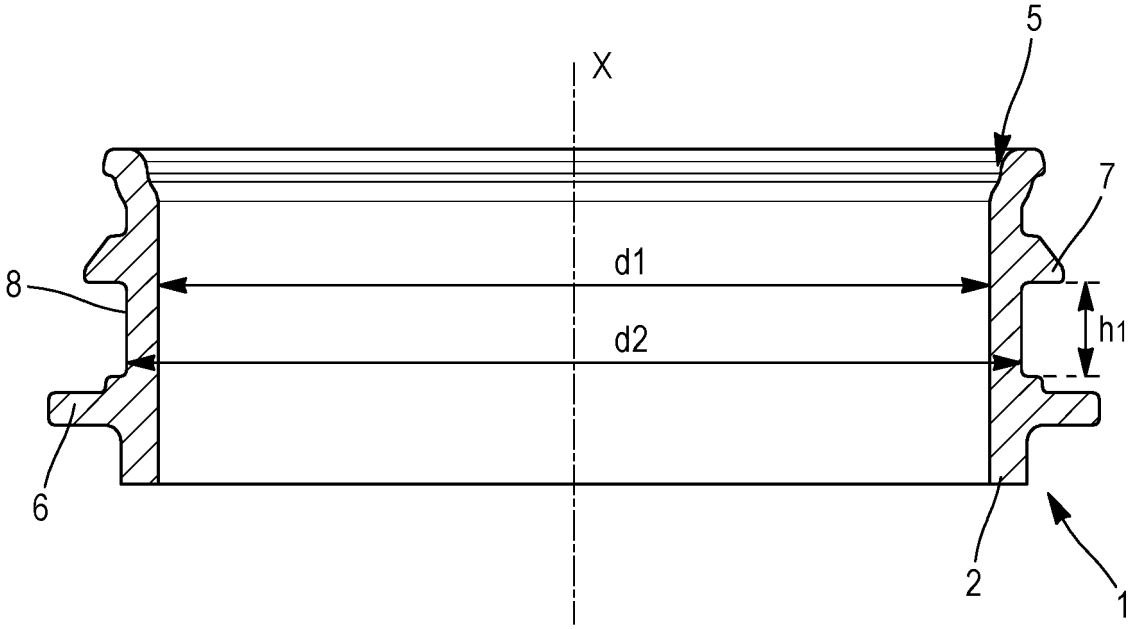

FIG. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/ES2020/070587

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D55/16 B65D1/02
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

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2018/086510 A1 (BERROA GARCIA JAVIER [ES]) 29 March 2018 (2018-03-29) cited in the application the whole document -----	1-14

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
27 January 2021	05/02/2021

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	Bridault, Alain

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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REFERENCES CITED IN THE DESCRIPTION

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