

Description

[0001] The present invention relates to a closing device with a seal for a container equipped with an opening.

[0002] In the past, various types of closing devices have been designed to close containers of different kinds.

[0003] In particular, devices have been produced aimed at providing security closure devices, to prevent unauthorised filling or removal of the product from the container, while making them easy to open for immediate use of the product, even by children.

[0004] Moreover, on containers where the product must be taken out in small quantities a number of times, the device must be designed so that, as well as closing the container, it must also ensure hermetic sealing until the product has been used completely, or, in the case where the container is refilled on other occasions, sealing must be ensured for the total period the container is used.

[0005] Very often such closing devices are designed using one end of the container that is specifically formed for this purpose.

[0006] More precisely, the container is equipped with a distributor orifice to convey the liquid directly out from the container towards the drinker's mouth, in the case where the product is a beverage or other type of alimentary fluid.

[0007] Moreover, these distribution orifices are generally covered and closed again using a waterproof membrane, such as aluminium, that may be welded or not, and that must be perforated in a suitable manner at the moment it is opened in order to prevent undesired soiling by the user during use.

[0008] This hermetic membrane is also designed to make the container tamper-proof, informing the user who opens the membrane that this is the first time it has been opened after manufacturing in the plant.

[0009] For example, the distributor orifice on containers that contain food sauces such as tomato sauce, ketchup, and other types of fluid products, is produced with an external thread, it is sealed with an aluminium membrane, then closed using a screw cap.

[0010] The cap is connected to its lower section by breakable bridging elements that act as a further guarantee that the container has never been opened.

[0011] Therefore, the intact container needs to be opened by unscrewing the cap on the orifice of the container. Once the cap has been removed, the membrane (in aluminium for example) that is equipped with a pulling tag is removed to permit the pouring of the product.

[0012] The container can be closed by simply re-screwing the cap back on the threaded distribution orifice.

[0013] It is obvious that this system involves a series of operations for the initial opening of the container, making this a closure method that is not particularly user-friendly.

er-friendly.

[0014] Other complex solutions have been proposed as devices for opening containers, that provide for complicated means of reciprocal action positioned between the said distribution orifice and the cap, generally of the type that converts the single direction rotation of the cap into an axial movement of the cap fitted with a means for cutting the membrane or material that seals the container.

[0015] The means of motion are generally composed of cams and surfaces that collaborate together and that are positioned between the two parts. In any case this system partially cuts the closure of the membrane or layered material on the container using toothed or similar perforating elements.

[0016] The membrane and/or the container wall is cut around a considerable portion of the circumference, similar to that of the tubular distribution orifice to provide a reasonably large opening, but not big enough to permit the portion of partially separated materials to fall into the product inside the container.

[0017] First of all, the construction of said closing devices requires complex processes that are not always easy to perform, produced by moulding the component parts.

[0018] There is a further aspect to be considered. All the closing devices described, are applied to the distribution orifice on the container in various ways, and not always to best advantage.

[0019] This orifice can be easily produced for plastic or glass containers by blow-moulding action.

[0020] However, if the container is made from some other material such as plasticated cardboard, tinned strips or metal materials in general, the distribution orifice will need to be produced in a much more complex manner, with the need for connecting various different elements.

[0021] The object of the present invention is to overcome the above problems of the prior art, and in particular, to produce a closing device with a seal for containers equipped with an opening, where this opening is not designed to act as the distributor orifice of the container, but is simply composed of a hole perforated on the external envelope of the container.

[0022] Another object of the present invention is to provide a closing device with a seal for containers equipped with an opening that can be easily produced by moulding.

[0023] Another object of the present invention is to provide a closing device with a seal for containers equipped with an opening that permits rapid assembly during product packaging in the plant, with a simple closing system once the container has been filled with the product.

[0024] Another object of the present invention is to provide a closing device with a seal for containers equipped with an opening that can offer the user a guarantee against any possible tampering with the product

contained in the container.

[0025] A further object of the present invention is to provide a closing device with a seal for containers equipped with an opening, that is particularly reliable, simple, functional, with contained manufacturing costs.

[0026] This and other objects, according to the present invention have been attained realising a closing device with a seal for containers equipped with an opening as described in claim 1.

[0027] Further characteristics will be described in the following claims.

[0028] The characteristics and advantages of a closing device with a seal for containers equipped with an opening, according to the present invention will be more obvious in the following description, that is used as a non limiting example, with reference to the appended schematic drawings in which:

Figure 1 is a side elevation view, with a partial cross section, of a first embodiment of the closing device with seal for containers equipped with an opening, according to the present invention;

Figure 2 is a cross section of figure 1, drawn according to trace line II - II;

Figure 3 is a cross section of figure 1, drawn according to trace line III - III;

Figure 4 is a cross section of figure 1, drawn according to trace line IV - IV;

Figure 5 is a side elevation view with a partial cross section, of the device illustrated in figure 1, ready to be positioned in the opening on the container during packaging, with a series of bridge rings, used as a seal, and intact;

Figure 6 is a blow-up view, with a partial cross section, of the closing device illustrated in figure 5, that shows the device in open position, with the bridging elements broken;

Figure 7 shows a side elevation view with partial cross section, of a second embodiment of the closing device with seal, for containers equipped with an opening according to the present invention;

Figure 8 shows a side elevation view with partial cross section, of a third embodiment of the closing device with seal, for containers equipped with an opening according to the present invention.

[0029] In reference to figures 1 to 6, the closing device is shown with numerals 10 for a container, 12, equipped with an opening 14.

[0030] In the illustrated example, according to the present invention, device 10 is manufactured by moulding in a single piece, that can however, be distinguished as having three different components, connected together by two series of breakable bridging elements around their circumferences.

[0031] In figure 1, a bottom of a circular cap 20, is connected to a top of a safety ring 30, comprising a series of bridging elements 50 arranged preferably according

to a circumference. A bottom of the safety ring 30 is connected to the top of a distribution orifice 40, through a series of sealing bridge elements 55 around the circumference.

[0032] The circular cap 20 has a cylindrical structure, closed at the top, while at the bottom, it has a circular rim 22. The external face of the cap is threaded 24, for a portion of the total height of the cap 20.

[0033] On cap 20, near the upper closure where there is no threaded surface 24, there is a channel or recess around the external circumference 26.

[0034] As can be seen in figure 2, this channel 26 presents a series of undercuts 28, of rectangular shape for example, around the circumference.

[0035] The safety ring 30 has a cylindrical structure open at both ends.

[0036] As can be seen in figure 3, there is a circumferential projection 32 near the upper rim of the ring 30 on the inside. This projection 32, presents a series of ridges 34, rectangular in shape for example, around the circumference facing inwards from ring 30.

[0037] These ridges 34 extend into the bridge elements 50 that connect ring 30 to the circular rim 22 of cap 20, in a perpendicular direction to the axis of device 10.

[0038] The distribution orifice 40 also has a cylindrical structure. At the top it presents a circular distribution rim 42, and at the bottom is an extension that forms a circular lip support plate 44 that is applied to container 12, in a direction perpendicular to the axis.

[0039] The orifice 40 is threaded 46, on a side of its inside surface for a portion of its total height.

[0040] As it can be seen in Figure 4, the circular rim 42 of the orifice 40 presents the sealing bridge elements 55 that permit the connection of orifice 40 to a lower circular rim 36 of ring 30, in a direction parallel to the axis of device 10.

[0041] The undercuts 28 of cap 20 are generally an even number in total and are arranged in a regular manner along the circumference channel 28 so that each pair of undercuts 28 is perfectly opposite one another.

[0042] In addition, the ridges 34 on the projection 32 are also generally an even number in total and are arranged in a regular manner along the circumferential projection 32 so that each pair of ridges 34 is perfectly opposite one another.

[0043] Moreover, the ridges 34 can total the same number as the undercuts 28.

[0044] The function of the closing device 10 according to the invention is fundamentally the following:

The moulded device 10 is mounted on the container 12 that is previously filled with the product and the circular lip plate 44 is fixed around the opening 14 on the container 12. This can be fixed by welding or gluing.

The closure of device 10 on the container 12 is produced by pressing cap 20 in the axial direction to-

wards the distribution orifice 40.

This provokes the breaking of the bridge elements 50, so that cap 20 is inserted inside the ring 30 and the distribution orifice 40.

[0045] Since the whole device 10 is preferably moulded from plastic material, such axial movement provides the click-in insertion of the cap 20 into the orifice 40; more precisely, after this operation, the projection 32 of the ring 30 is blocked inside the recess 26 of cap 20, while the thread 24 of cap 20 results as perfectly complementary with thread 46 of orifice 40, as is illustrated in figure 5.

[0046] Moreover, in this configuration the ridges 34 of ring 30 result as complementary to the undercuts 28 of cap 20.

[0047] At this point the container 12 is closed and sealed by device 10, and is ready for sale.

[0048] The sealing action, as is obvious, is produced by the sealing elements 55 between ring 30 and orifice 40 that bear the axial pressure applied for breaking the bridge elements 50 during the insertion stage of cap 20 into ring 30 and the orifice 40, as described previously.

[0049] The sealing elements 55 are broken the first time the container 12 is used when the unit composed of cap 20 and ring 30 is rotated; in this manner, threads 24 and 46 are freed (unscrewed) as shown in figure 6.

[0050] Reference has been made to a unit composed of a cap 20 and a ring 30, since the ridges 34 of ring 30, that are complementary to the undercuts 28 of cap 20, act so that when the ring 30 is rotated around its own axis, it engages the cap 20 to form a single unit, both moving together.

[0051] It is clear that the container 12 can also be closed by fixing the lip plate 44 around the opening 14 of the container 12, after device 10 has been previously assembled separately, however the procedure must be identical with the application of axial pressure on cap 20.

[0052] Figure 7 shows a further possible embodiment for practical application of this invention, where the same elements and/or equivalent elements to those illustrated in figures 1 to 6 bear the same reference numbers increased by 100.

[0053] Device 110 differs from device 10 only in the shape of the distribution orifice 140.

[0054] Under the circular lip plate 144, an extension is foreseen in the axial direction to form a ring 148. On the outside of this ring 148, an indentation 149 is channelled around the circumference.

[0055] This indentation 149 is used to house the border of the opening 114 of container 112, after device 110 is click-inserted from the exterior of container 112, until it forces the circular plate 144 down to make contact with the external surface of container 112.

[0056] Figure 8 shows a third possible embodiment for practical application of this invention, where the same components and/or equivalent components to those illustrated in figures 1 to 6 bear the same refer-

ence numbers, increased by 200

Device 210 differs from device 10 and device 110 only in the shape of the distribution orifice 240.

[0057] Under the circular lip plate 244, in this case, of a smaller size than the plates 44 and 144, an extension is destined in the axial direction to form a cylinder 248.

[0058] In this case the device 210 is inserted from inside the container 212 until the circular plate 244 is placed in contact around the opening 214 of container 212.

This is fixed to the surface by welding or gluing.

[0059] The characteristics of the closing device with seal for containers equipped with an opening according to the present invention have been described clearly, just as the advantages to be gained from this invention, among which we would recall the following:

- Rationalized production of the closing device, performed with a single mould;
- Rapid product packaging in the container, thanks to the practical device closure;
- Simple and reliable use for the end user.

[0060] Finally, it is also clear that the closing device with seal for containers equipped with an opening, conceived in this manner can be adapted with numerous variants and modifications, all of which are included in the concept of this invention; moreover, all the components . can be replaced with elements that are technically equivalent. In short, the materials employed, the shapes and the sizes of the components can be of any kind according to technical necessity.

[0061] The scope of protection of the invention is therefore limited by the appended claims.

Claims

1. Closing device (10, 110, 210) for a container (12, 112, 212) equipped with an opening (14, 114, 214) at which is mounted a cylindrical distribution orifice (40, 140, 240) closed by a cap (20, 120, 220) with interposed thread (24, 46, 124, 146, 224, 246), with sealing elements (55, 155, 255) provided between said orifice (40, 140, 240) and said cap (20, 120, 220) to illustrate a first use of said container (12, 112, 212), **characterised in that** said closing device (10, 110, 210) is obtained by moulding in a single piece, and in a first position immediately after moulding , between said cap (20, 120, 220) and said distribution orifice (40, 140, 240), said sealing elements (55, 155, 255), that form a security ring (30, 130, 230), called protection ring (30, 130, 230) being connected, at least at one end, to a free rim (22, 122, 222) of said cap (20, 120, 220), by bridge elements(50, 150, 250) and at least its second end is connected to said orifice (40, 140, 240), by said sealing elements (55, 155, 255).

2. Device according to claim 1, **characterised in that** in a second operative position on the container, said cap is inserted into said ring (30, 130, 230) and said distribution orifice (40, 140, 240), and after having broken said bridge elements (50, 150, 250), it engages at least one projection (32, 132, 232) with at least one recess (26, 126, 226), respectively created on the ring (30, 130, 230) and on the cap (20, 120, 220), or vice versa, and a first thread (24, 124, 224) of the cap (20, 120, 220) with a second thread (46, 146, 246) of the orifice (40, 140, 240), so that said cap (20, 120, 220) becomes a single unit with said ring (30, 130, 230). 5

3. Device according to claim 2, **characterised in that** said cap (20, 120, 220), after having broken the bridge elements (50, 150, 250), forms a single unit with the said ring (30, 130, 230), so that a series of ridges (34, 134, 234) created on said projection (32, 132, 232) collaborate with the undercuts (28, 128, 228) created on said recess (26, 126, 226). 10

4. Device according to claim 1, **characterised in that** said bridge elements (50, 150, 250) are extended in a direction that is essentially perpendicular with the axis of the device (10, 110, 210), and these are broken when subject to pressure applied in an axial direction. 15

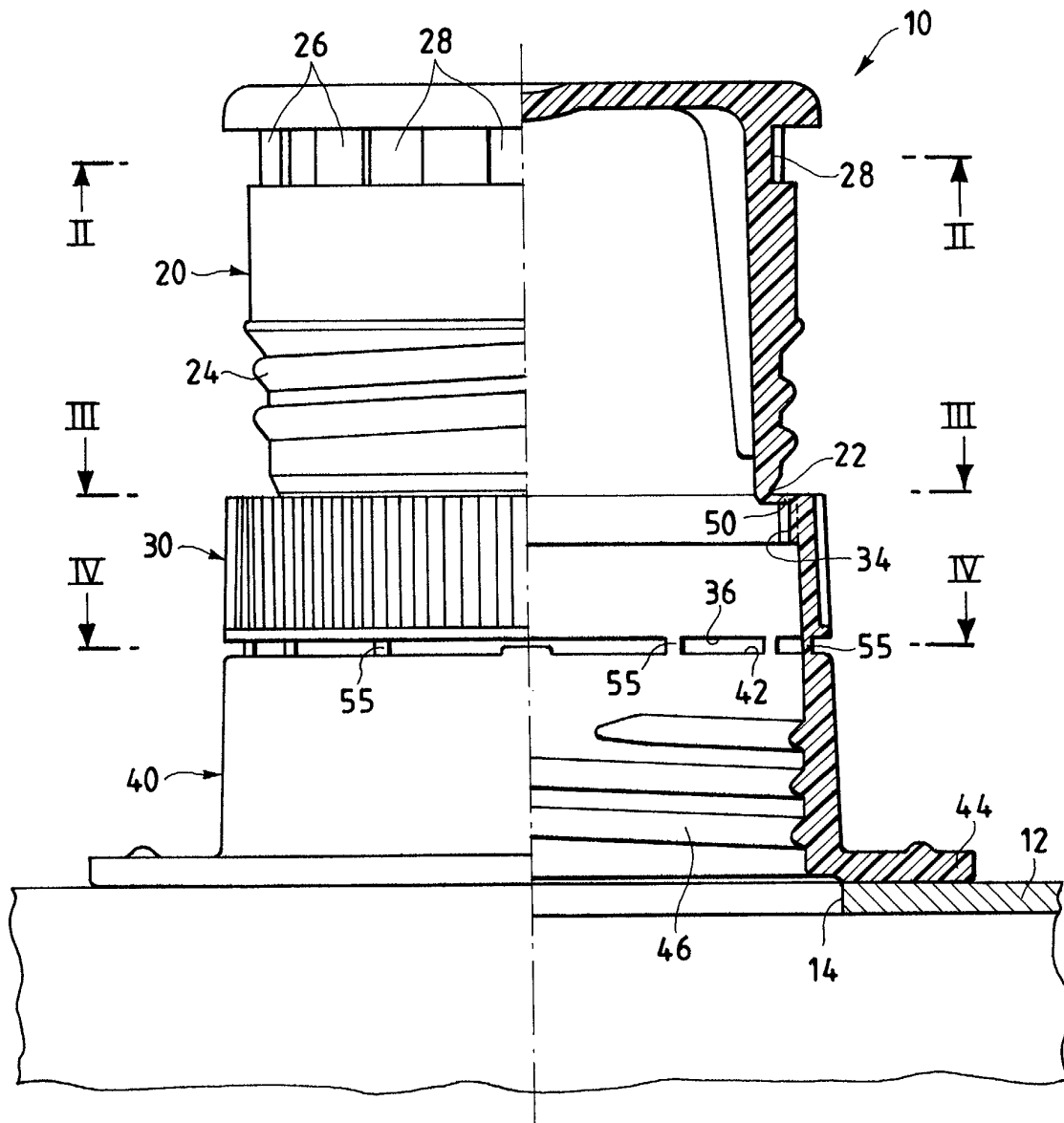
5. Device according to claim 1, **characterised in that** said sealing elements (55, 155, 255) are created in bridge form and are extended in a direction that is essentially parallel to the axis of the device (10, 110, 210), and they are broken when subject to pressure by a rotation around the axis. 20

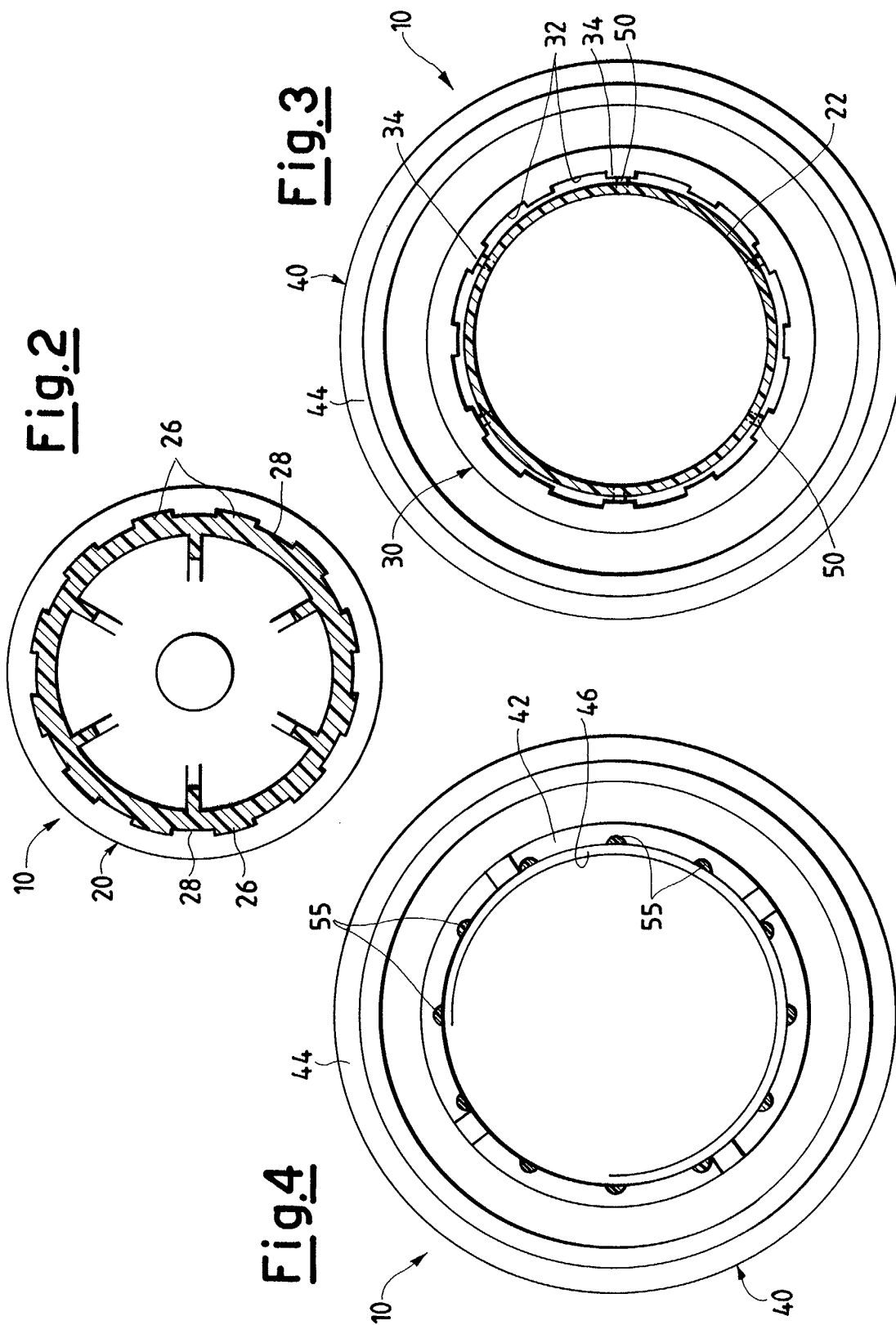
6. Device according to claim 1, **characterised in that** said distribution orifice (40) has a cylindrical structure that is equipped with an extension from underneath, in the direction at right angles to the axis, so that it forms a circular support plate (44), that is fixed to the container (12) around its opening (14). 25

7. Device according to claim 1, **characterised in that** said distribution orifice (140) has a cylindrical structure that is equipped with two extensions underneath, one in a direction at right angles to the axis, forming the circular support plate (144), and another in the axial direction, that forms a ring (148) on the outside of said ring (148) a housing is channelled around the circumference (149), to house the lip of the opening (114) of the container (112) after said device (110) has been click-inserted onto the exterior of the container (112), until it fixes the plate (144) to the external surface of the container (112). 30

8. Device according to claim 1 **characterised in that** said distribution orifice (240) has a cylindrical structure that is equipped with two extensions underneath, one in a direction that is at right angles to the axis forming a circular support lip plate (244), and another in axial direction forming a cylinder (248), the device (210) being inserted from the inside of the container (212), until it fixes the circular lip plate (244) around the opening (214) of the container (212). 35

Fig.1





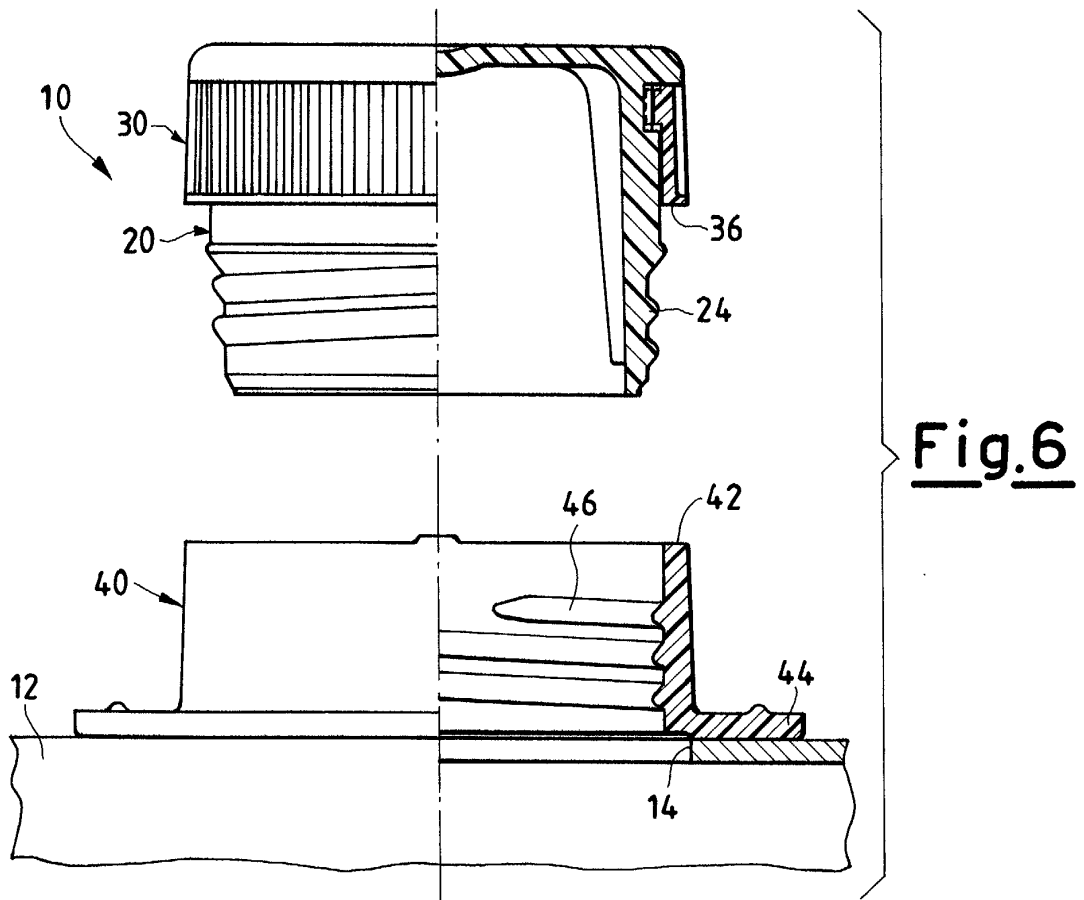
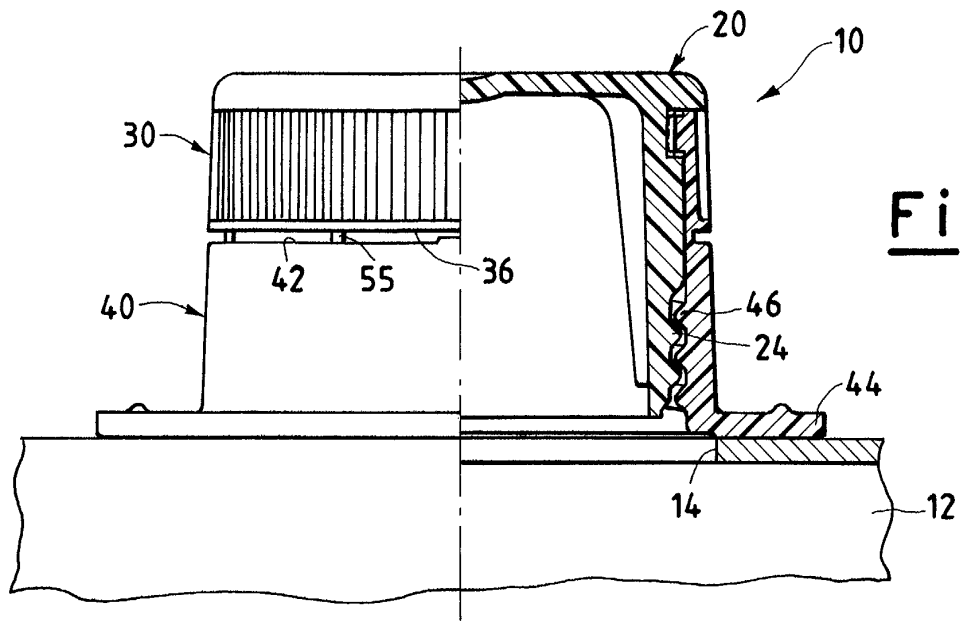


Fig. 7

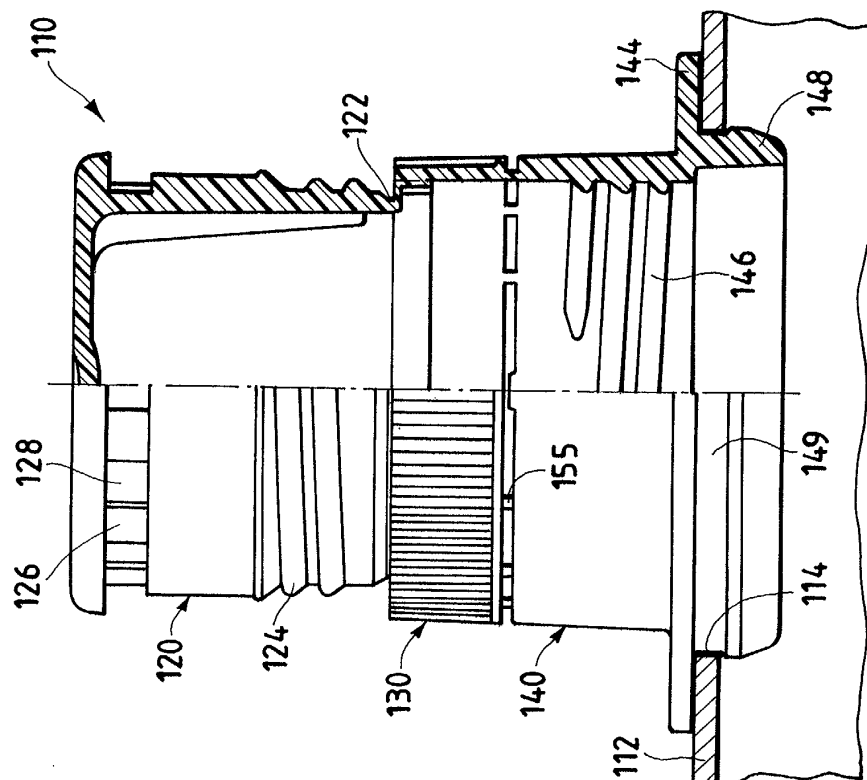


Fig. 8

