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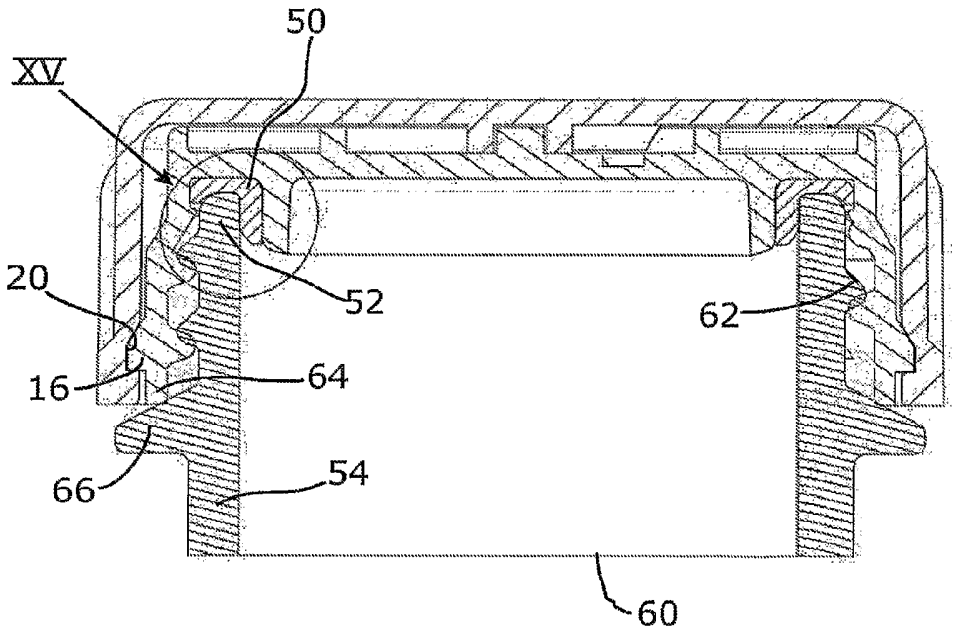
[Continued on next page]

(54) **Title:** TAMPER-PROOF SEALING CAP



(57) **Abstract:** A sealing cover particularly suitable for bottles for beverages comprises a sealing element (19) for sealing an outlet opening (60) of a container. Further, the sealing cover comprises a safety element (18) which is cap-shaped, for example, and adapted to be displaced or twisted relative to the sealing element (10) from a closed position into an opening position.. Further, an indicating means (34) for indicating the opening position is provided. According to the invention, the indicating means (34) is arranged at an outside (74) of the sealing element (10) or the safety element (18) so that the indicating means (34) is tangible because of the change of position of the indicating means upon transferring it from the closed position into the opening position.

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Tamper-Proof Sealing Cap

The invention relates to a sealing cap for containers. The sealing cap is particularly suitable for sealing bottles for beverages, particularly plastic and glass bottles.

In a commonly used system for sealing bottles for beverages, it is known to provide at the lower periphery of a plastic or metal cover a ring or several separate elements connected with the cover via cages (webs), at least a portion of the connecting cages (webs) being broken/ruptured upon opening the bottle. The consumer can recognize there from that the bottle has already been opened. Such sealing caps, however, have the disadvantage that the cap may already be slightly opened in a way that the connecting cages (webs) are at first elongated and then broken thus permitting gas and liquid to escape and foreign elements/liquids to be introduced into the container. With carbonated pop-soda beverages or water containing carbon dioxide, this results in that, for example, the carbon dioxide escapes at least partially and the quality of the beverage suffers a deterioration there from. Further, there is the risk of a contamination of the contents of the container because of the possibility of the sealing cap being slightly opened therefore allowing the introduction of foreign contents into the container.

To avoid these drawbacks, it is known from WO 02/057141 to provide a sealing closure with two sealing caps, an inner sealing cap being surrounded by an outer sealing cap. The inner sealing cap is provided with an internal

thread and adapted to be screwed onto a bottleneck. The inner cap, serving as a sealing element for sealing an outlet opening of a container, such as a bottle for beverages, comprises a closing part at its upper surface which closes a pressure compensation opening in the inner cap. Further, this surface is provided with a pulling element as well as with a catch element. The outer cap surrounding the inner cap rotates relative to the inner cap by a given angular range. At the inner surface of the outer cap opposite to the upper surface of the inner cap, an arm comprising a cutting edge is provided. By rotating the outer cap, the cutting edge of the arm removes the closing part of the inner cap thus the pressure compensation opening. When the outer cap is rotated further, the arm of the outer cap abuts on the holding element of the inner cap so that the inner cap is co-rotated. Thereby, the bottle can be opened then. Additionally, catch elements are provided at the above-described opposite surfaces of the two caps in order to avoid that the outer cap is rotated back with respect to the inner cap. As soon as the sealing cover has been opened, the closing part of the inner cap is thus removed. Since the outer cap is transparent, this can be recognized by the consumer. To this end, however, it is absolutely necessary that the outer cap is transparent. Further, the sealing cover has the disadvantage that the fact that the closing part has already been removed can be easily overlooked by the consumer.

It is the object of the invention to provide a temper-proof sealing cap whereby the certainty that the cap has not previously been opened by a third person is improved.

This object is solved, according to the invention, by the features of claim 1.

The sealing cover according to the invention comprises a sealing element for sealing an outlet opening of a container, particularly a bottle and, in a particularly preferred case, a plastic or glass bottle for beverages, carbonated and non. Preferably, the sealing element has a cap-shaped configuration. Further, the sealing cover according to the invention comprises a safety

element tailored to be displaced from a closed position into an opening position with respect to the sealing element. Before being opened first, the safety element is in the closed position and can be transferred into the opening position by being displaced, particularly twisted, once (and only once) with respect to the sealing element. According to the invention, once a safety element has been brought into the closed position, it cannot be displaced or twisted back into the opening position any more. The safety element may be an annular or cap-shaped element. Particularly, the safety (temper-evident) element may be arranged within or also without the sealing element and surround the latter particularly partially and, in the particularly preferred case, surround it completely. In order to prevent the safety element from being twisted or displaced back from the opening position into the closed position in a first embodiment, a release means is connected with the sealing element and the safety element or rather arranged between these two elements. The release means serves to permit or release the twisting of the sealing element for completely opening the element. To this end, for example, a latch engaging into a recess of the bottle may be pulled back by the release means. Preferably, however, the release means comprises catch elements by which the safety element is connected with the sealing element so as to rotate with the latter. As described later, it is also possible to provide a holding mechanism between the sealing element or the safety element and the bottle neck or another opening wall of a container.

To indicate to the consumer whether a bottle for beverages or another container has already been opened, an indicating means (temper-evident) is connected with the sealing element and/or the safety element. The indicating means indicates whether the sealing cover has ever previously been in the opened position. To this end, an actuating means is connected with the safety element and/or the sealing element, which serves to actuate the indicating element. In doing so, the actuating means is displaced relative to the indicating means to actuate the indicating means. The actuating means may

either be provided at the sealing element or at the safety element, the indicating means being preferably provided at the other element.

The indicating means is provided at an outside of the sealing element or the safety element, i.e., at an outside of the sealing cover so that the consumer is able to recognize as easily as possible whether the sealing cover has ever been brought into the opening position. The indicating means may be provided at the sealing element or at the safety element, the indicating means being provided, according to the invention, at an outside, i.e., at that side of the two elements that is not covered by the respective other element. In doing so, it has to be considered that the elements do not have to cover each other completely since the safety element may also be configured as a ring, for example. According to the invention, the position of the indicating means is changed upon opening, i.e. upon transferring the safety element from the closed position into the opening position. This is effected in that, for example, the indicating means is at least partially pressed out of the outside. Since this change of position occurs at an outside of the sealing element or the safety element, it is readily perceived by the consumer. Particularly, the change of position of the indicating means is also tangible so that it can be perceived by blind consumers as well. In this case, it is particularly preferred to provide the indicating means at an upper surface and not at the outer jacket surface of the sealing cover so that the indicating means is adapted to be seen and felt well. Further, the indicating means may be configured in a colour differing from that of the sealing cover, preferably in a signal colour.

The invention aims at preventing foreign bodies and/or liquids to be introduced into the container between the bottling plant and the actual purchase point, without the knowledge of the consumer, hence the temper-evident mechanism.

The mechanism according to the invention works in a way as to make the undercap (which is in contact with the liquids in the container) close — after

briefly rupturing the pin — the container thus providing all the sealing properties as found in the cap prior to being opened.

In a particularly preferred embodiment, the actuating means is configured as a ramp. When displacing or twisting the safety element and the sealing element relative to each other, the indicating means is pressed outward according to the invention. This is effected by displacing the indicating element preferably vertical to the displacement direction along the ramp and thus pressing it outward when it is displaced or twisted. The change of position of the indicating means provoked thereby is effected to the outside, i.e., in a manner that the indicating means protrudes beyond an outside of the sealing cover. Preferably, the indicating means is connected to the sealing element or the safety element via a web. When the indicating means changes its position, a separation of the web shall be preferably avoided. This can be guaranteed by preferably providing the web on the side pointing towards the ramp front end in the opening position.

The ramp as well as the indicating means can be arranged in the jacket surfaces of the sealing element and the safety element, respectively, so that the indicating means protrudes laterally outward in an upright container in the opening position . Preferably, however, the indicating means as well as the actuating means are provided at those surfaces of the two elements that are horizontal when the container is in its upright position. In this preferred embodiment, the sealing element as well as the safety element are configured as a cap, the safety element preferably surrounding the sealing element.

Preferably, the sealing cap according to the invention additionally comprises a pressure compensation means serving to reduce the pressure in the container when it is opened. Preferably, the pressure compensation means is actuated before the safety element has reached the opening position. Preferably, the pressure compensation means comprises a cutting element. By displacing the safety element, the cutting element can remove a closing part closing a

pressure compensation opening of the sealing element. In the case of non-carbonated beverages/fizzy liquids the cutting mechanism and its relating pin may be optional as the concept becomes redundant owing to the lack of gas.

Preferably, the pressure compensation means is arranged within a storage room to ensure that the separated closing part does not interfere or come between the sealing element and the safety element and impair the operation of the sealing cap.

Preferably, a sealing ring is arranged in a groove of the sealing element to prevent even small amounts of gas from escaping from the container. To this end, with the sealing cover screwed on, the sealing ring is preferably arranged between an inside wall of the outlet opening of the container and a groove wall and contacts both surfaces. The groove wall is arranged within the outlet opening.

Optionally, upon cutting the pin to allow the exit of excess gas from the bottle, a mechanism is provided producing a certain noise, e. g. a. pop (like a champagne cork) or a whistle (for kids parties).

Additionally, an RFD (radio frequency device) which is a dormant chip (transponder) which can be activated by an external radio source may be included within the cap. This technology may be used for several applications, such as: substitution of codebars, inventory management, prize-givings (raffles), research, etc.

According to a particularly preferred embodiment, the safety element and/or the sealing element of the sealing cap of the invention comprise at least one holding element. Preferably, a plurality of such holding elements, particularly three, are provided, arranged at positions distributed around the periphery. By the at least one holding element, it is guaranteed that the safety element will be displaced relative to the sealing element when the container or bottle is

opened for the first time. Upon displacement of the safety element, which displacement is particularly a twisting movement of the two elements relative to each other, the indicating means is actuated by the actuating means. In this regard, the at least one holding element is preferably configured to the effect that, e.g. when the sealing element is twisted for opening the container, the safety element will first be held in its position. This is performed e.g. by a quarter turn or a half turn of the sealing element. In the process, the indicating means is actuated via the actuating means. Thereafter, the safety element can be rotated along together with the sealing element.

Preferably, the least one holding element is arranged to cooperate with at least one retaining element arranged on the container, i.e. particularly on the bottleneck. The at least one retaining element is preferably arranged on the outer side of the neck of the container or bottle. The number of the retaining elements preferably corresponds to the number of the holding elements.

According to a particularly preferred modification of this embodiment, the at least one holding element extends through an opening formed in the sealing element, in case that the holding element is provided on the safety element. If the holding element is provided on the sealing element, the opening is arranged correspondingly on the safety element. The opening is preferably formed as a segment of an annular ring. Preferably, a plurality of such openings are provided, with preferably one respective opening provided for each holding element. According to a particularly preferred embodiment, the safety element, which is preferably disk-shaped, comprises projections serving as holding elements and extending through openings in the connecting element preferably towards the inside, i.e. in the direction of the container. In the closed condition, the at least one holding element is arranged between a wall region of the container opening, such as a bottleneck, and the sealing element.

The safety element is preferably disk-shaped and arranged within a deepened portion of the sealing element. Thus, in a cap-shaped sealing element, the cap preferably has its top side formed with a circular deepened portion accommodating the disk-shaped safety element. Provided within this deepened portion, particularly along the outer edge thereof, are the preferably plural openings which have the preferably plural holding elements extending therethrough.

To connect the safety element and the sealing element after a first rotation, connecting elements are configured. During this first rotation the sealing element is rotated with respect to the safety element which is held in position by retaining elements. During this first rotation the position of the indicating means has changed to indicate that the bottle or container was partly opened. By this first rotation the bottle or container is not yet completely opened. To hold the safety element in place with respect to the sealing element so that the position of the indicating means cannot be changed anymore, connecting elements are provided. Preferably the connecting elements comprise a snap-in locking or the like.

Hereinafter, the invention is explained in detail with respect to preferred embodiments thereof with reference to the accompanying drawings.

In the Figures:

Figure 1 shows a schematic perspective view of the sealing element from below,

Figure 2 is a schematic perspective view of the sealing element from above,

Figure 3 is a schematic top view of the sealing element,

Figure 4 is a schematic sectional view of the sealing element along line IV-IV in Figure 3,

Figure 5 is a schematic sectional view of the sealing element along line V-V in Figure 3,

Figure 6 is a schematic perspective view of the safety element from below,

Figure 7 is a schematic perspective view of the safety element from above,

Figure 8 is a schematic internal view of the safety element,

Figure 9 is a schematic sectional view along line IX-IX in Figure 8,

Figure 10 is a schematic perspective view of a sealing ring,

Figure 11 is a schematic top view of the sealing ring,

Figure 12 is a schematic sectional view of the sealing ring along line XII-XII in Figure 11,

Figure 13 is a schematic perspective view of the assembled sealing cover,

Figure 14 is a schematic longitudinal sectional view of the sealing cover screwed upon a bottle,

Figure 15 is a schematic enlargement of the portion XV in Figure 14,

Figure 16 is a simplified schematic diagram of another embodiment of the sealing cover,

Figure 17 is a simplified schematic diagram of a further embodiment of the sealing cover,

Figure 18 is a schematic perspective view of a further preferred embodiment,

Figure 19 is a schematic sectional view of the sealing element according to the embodiment illustrated in Fig. 18 provided on a bottleneck,

Figure 20 is a schematic sectional view taken along the line XX, additionally showing the safety element,

Figure 21 is a schematic sectional view taken along the line XXI in Fig. 19,

Figure 22 is a schematic side view of a bottle neck on which the sealing cover can be screwed,

Figure 23 is a schematic perspective view of the safety element of a preferred embodiment shown in Fig. 18 – 24, and

Figure 24 is a schematic perspective view of the safety element.

In the illustrated preferred embodiment (Figure 1 - 15), the sealing element 10 (Figure 1 - 5) is configured as a cap with an internal thread 12. Thus, the sealing element 12 comprises a substantially cylindrical jacket surface 14 with several projections and shoulders. A circumferential retaining ring 16 (Fig. 4) is provided at the outer jacket surface 14. The retaining ring 16 serves to retain a safety element 18 (Fig. 6 - 9), the safety element 18, in the illustrated embodiment, being also configured as a cap and completely surrounding the sealing element 10 when the sealing cover is assembled (Fig. 14). Then, the retaining ring 16 engages into a circumferential groove 20 (Fig. 9) provided at the inner jacket surface 22 of the safety element 18 (Fig. 14).

Further, the outer jacket surface 14 of the sealing element 10 is provided with a release means with two stops 24,26 and a catch element 28. The release element serves to firmly connect the sealing element 10 with the safety element 18 (see below). A further release means 24,26,28 is provided on the opposite side of the outer surface 14 of the sealing element 14 (Fig. 5).

At an end face 30 of the sealing element 10, an actuating means 32 is provided which, in the illustrated embodiment, is configured as a double ramp. The actuating means 32 serves to actuate an indicating means 34 provided in the safety element 18 (Fig. 6-9). Additionally, there may be located a protuberance between the two caps, i. e. between the sealing element 10 and the safety element 18.

Furthermore, an annular projection 36 is provided at the end face 30 so that a storage room 38 is formed within this annular projection 36. Within the storage room 38 at the end face 30, a cylindrical closing part 40 of a pressure compensation means is provided which further comprises a cutting element 44 (Fig. 8) provided at an inner surface 42 (Fig. 9).

Furthermore, the sealing element 10 is provided with an annular groove 48 (Fig. 4) at a cover inside. Within the groove 48, a sealing ring 50 is arranged (Fig. 14,15). When the sealing cover is screwed on (Fig. 14), an upper rim 52 of a bottleneck 54 of a container is also arranged in the groove 48. Thereby, the sealing ring 50 is compressed and has a substantially rectangular cross section so that a portion of the sealing ring is arranged between an inside wall 56 of the container neck 54 and a groove wall 58. Thereby, a sealing of an outlet opening 60 of a container by means of the sealing cover according to the invention is guaranteed. The sealing ring 50 is shown in both Figures 10 and 11.

For mounting the sealing cover, for example, the sealing element 10 configured as a cap is first screwed onto a bottleneck 54 of a container, the

thread 12 of the sealing element 10 engaging into a thread 62 provided at the bottleneck. In doing so, the upper end 52 is introduced into the groove 48 of the inside of the sealing element. Thus, the container is sealed tightly. Additionally, a lower edge 64 of the sealing element contacts a circumferential carrying ring 66 of the container whereby a further sealing is ensured.

In the next step, the safety element 18 (Figure 6 - 9) also configured as a cap in the illustrated embodiment is pressed from above onto the sealing element in the correct position. The position is chosen such that a cutting edge 68 (Figure 8) of the cutting element 44 is arranged in front of the closing part 40 in a counterclockwise rotational direction. Then, two opposite catch elements 70 provided at the inside wall 22 of the safety element (Fig. 8) are arranged in counterclockwise rotational direction in front of the ramp-shaped catch element 28 which is also located opposite (Fig. 2,3) . Furthermore, the cylindrical indicating means 34 provided at the end face 72 (Fig. 6) is also arranged, in counterclockwise rotational direction, in front of the double ramp serving as an actuating means 32.

As long as the afore-mentioned elements are located in front of the corresponding elements in counterclockwise rotational direction, the sealing cover is in the closed position in which the container has never been opened. In order to open the container for the first time, i.e., to transfer the sealing cover into the opening position, the safety element 18 is rotated in counterclockwise direction. Due to the friction between the sealing element 10 and the bottleneck 54, the sealing element 10 will not be co-rotated from the start. By the rotation, the indicating means 34 is moved toward the actuating means 32 configured as a double ramp and pressed outward by the ramp 32 when it is rotated further in counterclockwise direction so that the indicating means 34 changes its position and is pressed out of an outside 74 (Fig. 7). Because of this change of position of the indicating means 34, it is clearly visible and also tangible that the receptacle has already been opened. To avoid a loss of the indicating means 34 which would make the perception by touching harder, the

indicating means 34 is connected to the safety element 18 by a web 88 (Fig. 6).

During this rotation, the catch elements 70 (Fig. 6) simultaneously glide over the ramp-shaped catch elements 28 located opposite each other and provided at the outside 14 of the sealing element 10, the safety element 18 being slightly deformed elastically in this area. After the catch elements 70 have overcome the ramp-shaped catch elements 28, they snap into spaces 76 (Fig. 2,3) between the catch element 28 and the stop 26. As soon as the catch element 70 has snapped into the gap 76, it is no longer possible to rotate back the safety element 18 in clockwise direction without simultaneously taking along the sealing element 10. It is no longer possible to continue to rotate the safety element 18 in counterclockwise direction without taking along the sealing element 10, either. Thus, the receptacle is completely opened by continuing to rotate the safety element 18 in counterclockwise direction since the sealing element 10 is rotated therewith.

Simultaneous with the two steps described above, namely the actuation of the indicating means 34 by the actuating means 32 and the snapping of the catch elements 70 into the recess 76, the pressure compensation means 40,44 is actuated. To this end, a cylindrical projection 78 (Fig. 2) is provided centrally in the storage room 38, which engages into a cylindrical recess 80 (Fig. 6-9). Further, a nose 82 (Fig. 9) engaging into a guiding groove 84 (Fig. 2) is provided at the inside 72 of the safety element 18. When the safety element 18 is rotated in counterclockwise direction for the first time, the cutting edge 68 of the cutting element 44 removes the closing part 40 at the same time as the indicating means 34 is pressed outward and the catch elements 70 snap in. By removing the closing part 40, a pressure compensation opening 86 (Fig. 1) provided under the closing part 40 is opened. This has the advantage that a small amount of gas may escape through the pressure compensation opening 86 and the first opening process is made easier thereby. Because of the storage room 38 defined by a ring 36, the end face 30 and the inside 72 of the

safety element 18, it is ensured that the separated closing part 40 remains within the storage room 38.

Now, the sealing cover is in the opening position in which the safety element 18 and the sealing element 10 are connected for rotation. Now, the sealing cover can be repeatedly screwed onto the container and off again.

In a further preferred embodiment (Fig. 16), an annular safety element 90 is arranged within a sealing element 92 configured as a cap. In this embodiment, the indicating means is provided at a jacket surface of the sealing element 92 and is actuated by an actuating means attached to the outer jacket surface of the annular safety element 90. The required release means typically comprising catch elements is also arranged between the two jacket surfaces of the sealing element 92 and the annular safety element 18. If necessary, an appropriately designed pressure compensation mea ns may also be provided in this region.

In another embodiment (Fig. 17), a safety element 94 is also configured as an annular ring, the safety element 94 surrounding a sealing element 98 configured as a cap along the outer jacket surface. In this case, the indicating means is arranged in the jacket surface of the safety element 94, for example, and the associated actuating means is arranged at the jacket surface of the sealing element 96. In turn, the release means, which typically comprises catch elements, is arranged between the two jacket surfaces. In this region, a pressure compensation means may also be provided, if necessary.

In the further embodiments illustrated in the two schematic diagrams in Figures 16 and 17, the sealing element 92 and the safety element 94, respectively, are also turned for the first opening process, the respective other element not being co-rotated for the moment. Only after the indicating means has been triggered by the actuating means that can be configured in the above-described way and the two elements have been connected by the

release means which also may comprise catch elements, as described above, the respective other element is co-rotated and the receptacle can be opened completely.

A further particularly preferred embodiment of the sealing cap will be described hereunder with reference to Figs. 18 - 24.

According to this embodiment, the sealing element 100 is formed as a cap and comprises, within a circular deepened portion 102 (Fig. 19), the disk-shaped safety element 104. An inner side region 106 of the cap-shaped sealing element 100, facing towards the neck 108 of a container or bottle, is formed with a thread 110. The thread 110 is configured for engagement with a thread 111 formed on the outer side of bottleneck 108.

The sealing element 100 comprises an annular member 112 fixedly connected to a disk-shaped member 114 and surrounding the bottleneck 108, with the disk-shaped member 114 closing or covering a bottle or container opening 116. The disk-shaped member 114 is provided with a preferably circular projection 118 extending into the bottle opening 116. Projection 118 is provided to obtain a sealing effect towards an inner side 120 of bottleneck 108. Further, the bottom of disk-shaped member 114 is preferrably formed with reinforcement ribs 122.

In a circular region 124 arranged substantially between an outer side of the bottleneck 108 and the inner side 106 of the annular member 112 of sealing element 100, a plurality of openings 126 - three of them in the illustrated embodiment - are provided which are formed as segments of a circular ring and distributed along the periphery of region 124. Inserted into each of the openings 126 is a holding element 128 (Fig. 21) so that the holding element 128 is arranged between bottleneck 108 and annular member 112. The holding elements 128 - in the illustrated embodiment, three - are tightly

connected to the disk-shaped safety element 104 (Fig. 21). For better clarity, the safety element 104 is not illustrated in interrupted lines in Fig. 21.

On a top region 130 (Fig. 19) of disk-shaped member 114 wherein the deepened portion 102 is formed, a ramp 132 is provided as an actuating means, having the same function as the ramp 32 described in connection with the previous embodiments. Accordingly, safety element 104 is provided with an indicating means 134 of a function similar to that of indicating means 34 above. Thus, indicating means 134 is likewise connected to safety element 104 via a web 136.

Before the sealing cap is opened for the first time, it is arranged in the position illustrated in Fig. 20. In this position, the holding elements 128 are arranged respectively in front of a retaining element 138 in counterclockwise rotational direction. Each retaining element 138 comprises a holding flank 140 facing towards the holding element 128. During the first opening of the sealing cap, the sealing element 100 will first be rotated counterclockwise, i.e. in the direction marked by arrow 142. At the beginning of this rotation, the safety element 104 is retained in the initial position because the holding element 128 abuts the flanks 140 of the retaining elements 138. As a result, a relative movement between sealing element 100 and safety element 104 is effected. Due to this relative movement, the ramp 132 (Fig. 19) will be rotated into a position under the indicating means 134. Since the indicating means 134 is provided with a downward projection 135 or a counterpart ramp, the ramp 134 will be pressed upwards by the relative movement so that the ramp 134 in the reached opening position can be seen and/ or perceived by touching.

Actuation of the indicating means 134 through the actuating means 132 is performed by rotating the sealing element 100 in the range from 90°- 180°. Due to the thread pitch, sealing element 100 together with safety element 104 will be moved upwards, i.e. away from bottle opening 116 in the direction of arrow 144 (Fig. 21).

As a result, after the first rotation has been performed, the holding elements 128 are lifted and thus arranged above the retaining elements 138 and can be rotated past these. Now, the sealing element 100 and the safety element 104 will be rotated together. Thus, it is now possible to open the sealing cap completely.

To ensure that the sealing element 100 and the safety element 104 will be rotated together, connecting element 154, 156 are connected to or being part of the sealing element 100 and the safety element 104, respectively. Within the shown embodiment three ramp like elements 154 (Fig. 23) are connected to a inner surface 158 of the safety element 104 whereby the inner surface 158 is opposed to the top region 130 or outer surface 130 of the disc-shaped member 114 of the sealing element 100. Preferably the ramp like elements 154 are connected to a circular ring 160 protruding in the direction of the sealing element 100. The corresponding part of the connecting elements, i. e. the openings 156 (Fig. 24), are also arranged on a circular line on the upper surface 130 of the sealing element 100. The openings 156 are in contrary to the openings 126 preferably not formed as through-openings. Thus, as a result of the first rotation during which the safety element 104 is retained and the sealing element 100 is rotated, the ramp like elements 154 engage the openings 156 so that the safety element 104 is unrotatably connected to the sealing element 100. If the bottle or the container is opened and closed several times, the safety element 104 and the sealing element 100 will not be separated from each other due to the connection of the connecting elements 154, 156. After the connection of the connecting elements 154, 156 it is not possible to rotate the safety elements 104 with respect to the sealing element 100.

To make it possible, when the container shall be closed for the first time, to simply screw the sealing cap on again while safeguarding at the same time that the indicating means 134 will not be damaged and the holding elements

128 will reach their correct positions, the retaining elements 138 are ramp-shaped and formed with a rising flank 146 pointing in the clockwise direction. Thus, during the first closure of the container, the holding element 128 can slide over the flank 146 and then, as illustrated in Fig. 20, assume a position in front of the retaining flanks 140 in the counterclockwise rotational direction.

Preferably, the safety element 104 is held for rotation in the deepened portion 102 (Fig. 19) of sealing element 100 and is secured from falling out. For this purpose, a locking device is provided, wherein, in the illustrated embodiment, a circular edge 148 (Fig. 19) comprises a detent 150 projecting inwards into the deepened portion 102 and arranged for engagement behind a detent 152 provided on the safety element 104. Since both the sealing element 100 and the safety element 104 are preferably made from elastic material, particularly plastic, the safety element 104 in Fig. 19 can be pressed from above into the deepened portion 102 and will then be held for rotation in the deepened portion 102 by means of the locking device.

Further, in the embodiment described with reference to Figs. 18 - 24, a pressure compensation means 40,44 can be provided in a similar manner as in the embodiments according to Figs. 1 - 17. Preferably, as already described, the pressure compensation means 40,44 comprises a cutting element 44 for removal of a closing member 40 arranged to close a pressure compensation opening 86 in sealing element 100, as can be seen e.g. in Figs. 2 and 8.

In all of the above embodiments, the pressure compensation can be obtained in that, in addition to or without the provision of the pressure compensation means, the threads are provided with slits extending transverse to the longitudinal direction of the threads and interrupting the threads. This allows for the escape of gas during opening.

CLAIMS

1. A sealing cover, particularly for bottles for beverages, comprising

a sealing element (10, 100) for sealing an outlet opening (60, 116) of a container,

a safety element (18, 104) adapted to be displaced relative to the sealing element (10, 100) from a closed position into an opening position,

an indicating means (34, 134) connected with the sealing element (10, 100) and/or the safety element (18), for indicating the opening position,

an actuating means (32, 132) connected with the safety element (18, 104) and/or the sealing element (10, 100), for actuating the indicating means (34) upon displacing the safety element (18, 104), and

the indicating means (34, 134) being arranged at an outside (74) of the sealing element (10, 100) or the safety element (18, 104) and the position of the indicating means (34, 134) changing such in the opening position with respect to the closed position that it is tangible.

2. The sealing cover according to claim 1, characterised by a release means (24,26,28,70) connected with the sealing element (10) and the safety element (18), for permitting the rotation of the sealing element (10).

3. The sealing cover according to claim 1 or 2, characterized in that the actuating means (32, 132) has a ramp-shaped configuration so that the indicating means (34, 134) is pressed outward when the safety element (18, 104) and the sealing element (10, 100) are displaced relative to each other.

4. The sealing cover according to one of claims 1 - 3, characterized in that the indicating means (34, 134) is connected with the safety element (18, 104) or the sealing element (10, 100) via a web (88).

5. The sealing cover according to one of claims 1 - 4, characterized by a pressure compensation means (40,44) for reducing the pressure in the container upon opening.

6. The sealing cover according to claim 5, characterized in that the pressure compensation means (40,44) comprises a cutting element (44) for removing a closing part (40) closing a pressure compensation opening (86) in the sealing element (10).

7. The sealing cover according to claim 5 or 6, characterized in that the pressure compensation means (40,44) is arranged within a storage room (38) for storing the separated closing part (40).

8. The sealing cover according to one of claims 1 - 7, characterized by a sealing ring (50) arranged in a groove (48) of the sealing element (10).

9. The sealing cover according to claim 8, characterized in that the sealing ring (50) is arranged between an inside wall (56) of the outlet opening (60) of the container and a groove wall (58) and contacts them when the sealing cover is screwed on.

10. The sealing cover according to one of claims 1 - 9, characterized in that the safety element (18, 104) surrounds the sealing element (10, 100) at least partially.

11. The sealing cover according to one of claims 1 - 10, characterized in that the safety element (18, 104) is annular or cap-shaped.

12. The sealing cover according to one of claims 1 - 11, characterized in that the release means comprises catch elements (72) to interconnect the safety element (18) and the sealing element (10) for co-rotation.

13. The sealing cover according to any one of claims 1 - 9, characterized in that the safety element (104) and/or the sealing element (100) comprise at least one holding element (128) to guarantee a displacement of the safety element (104) relative to the sealing element (100) when the container is opened.

14. The sealing cover according to claim 13, characterized in that the holding element (128) cooperates with at least one retaining element (138) provided on the container.

15. The sealing cover according to claim 13 or 14, characterized in that the holding element (128) extends through an opening (126) of the sealing element (100) and the safety element (104), respectively.

16. The sealing cover according to claim 15, characterized in that the opening (126) has a circular shape.

17. The sealing cover according to any one of claims 13 - 16, characterized in that the holding element (128) is arranged between a wall portion (108) of the container opening (116) and the sealing element (100).

18. The sealing cover according to any one of claims 14 - 17, characterized in that the retaining element (138) is ramp-shaped.

19. The sealing cover according to any one of claims 13 - 18, characterized in that the safety element (104) is disk-shaped and is arranged particularly in a circular deepened portion (102) of the sealing element (100).

20. The sealing cover according to any one of the claims 13 – 19, characterized in that the holding element (128) is lifted by rotation of the sealing element (100) so that the holding element (128) disengages with the retaining element (138) after the sealing cover is partly opened.

21. The sealing cover according to claim 20, characterized by at least connecting element (154, 156) for connecting the safety element (104) and the sealing element (100) by rotating the sealing element (100) relative to the safety element (104).

22. The sealing cover according to claim 20, characterized in that the connecting element (154, 156) comprises a snap-in locking.

23. The sealing cover according to claim 21 or 22, characterized in that the connecting element (154, 156) comprises a ramp like element (154) engaging an opening (156) in a connected position.

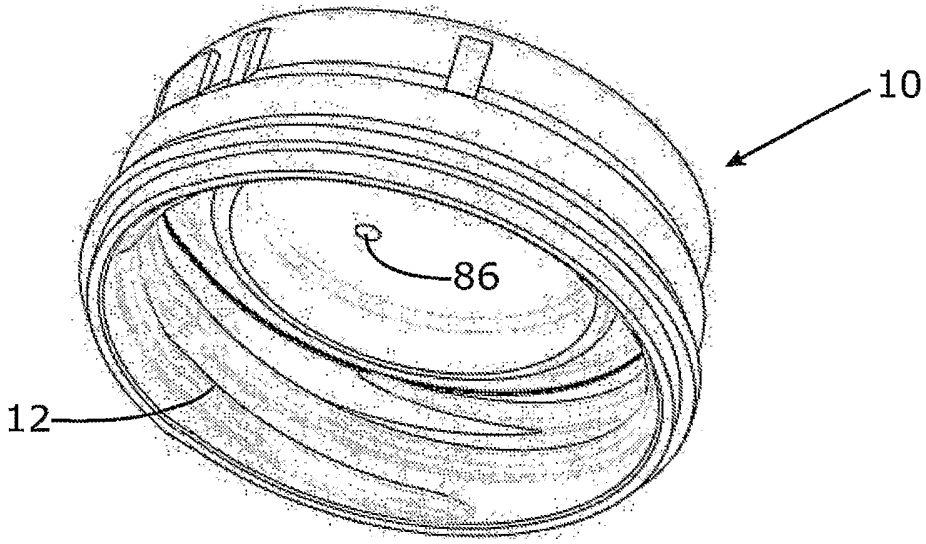


Fig.1

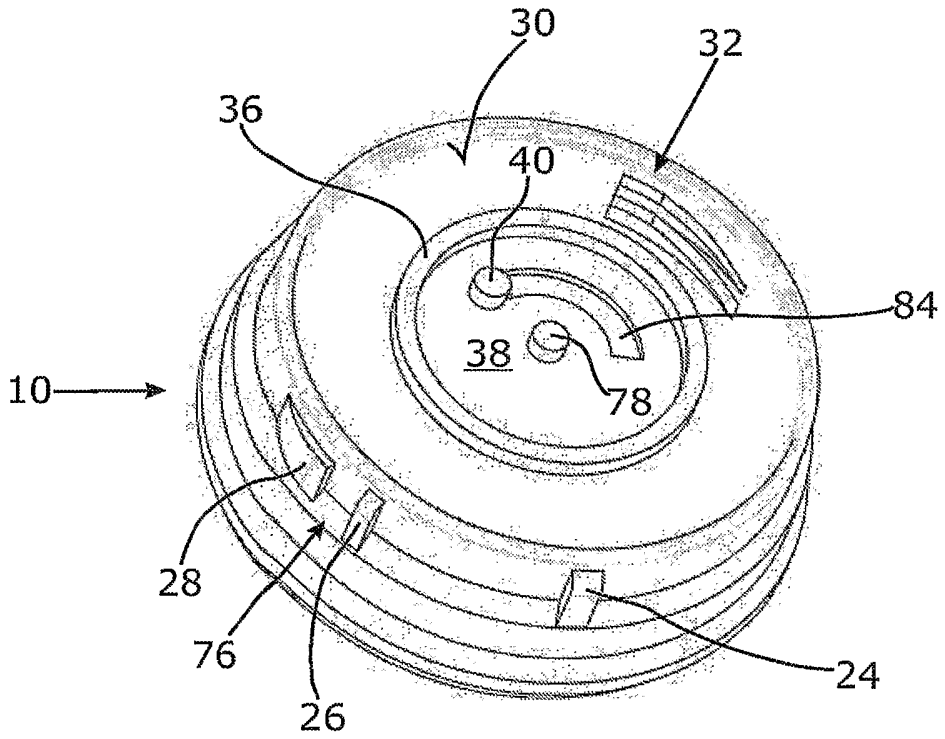


Fig.2

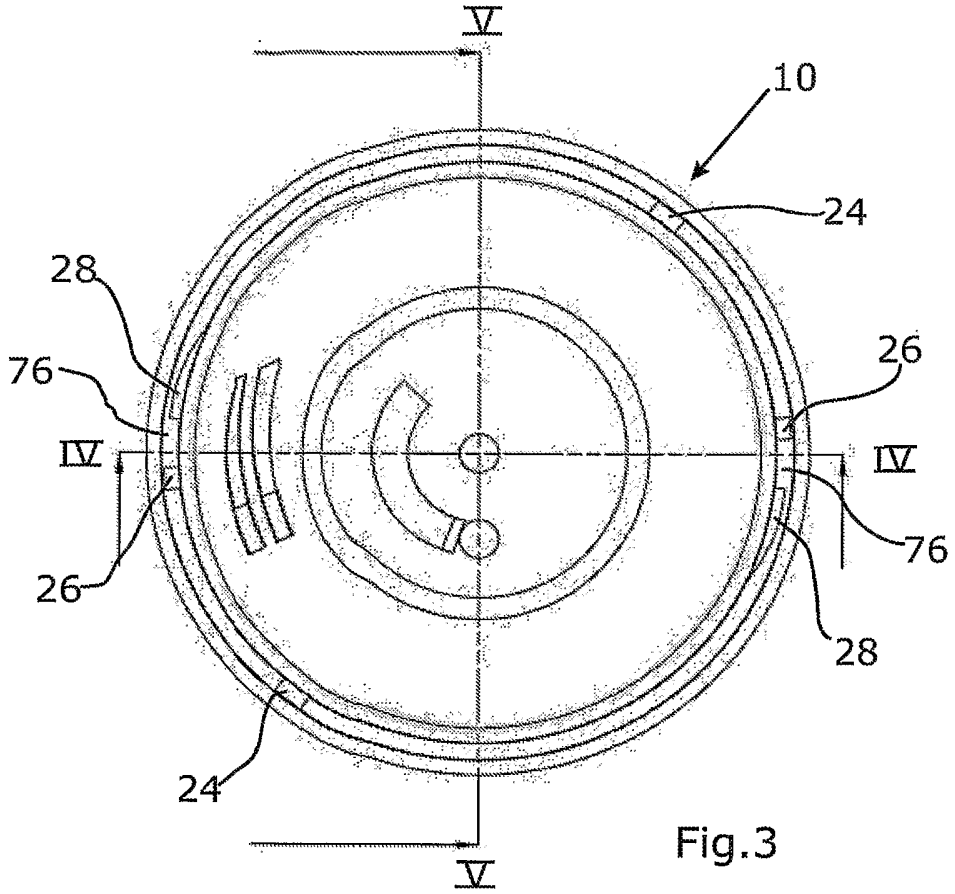


Fig.3

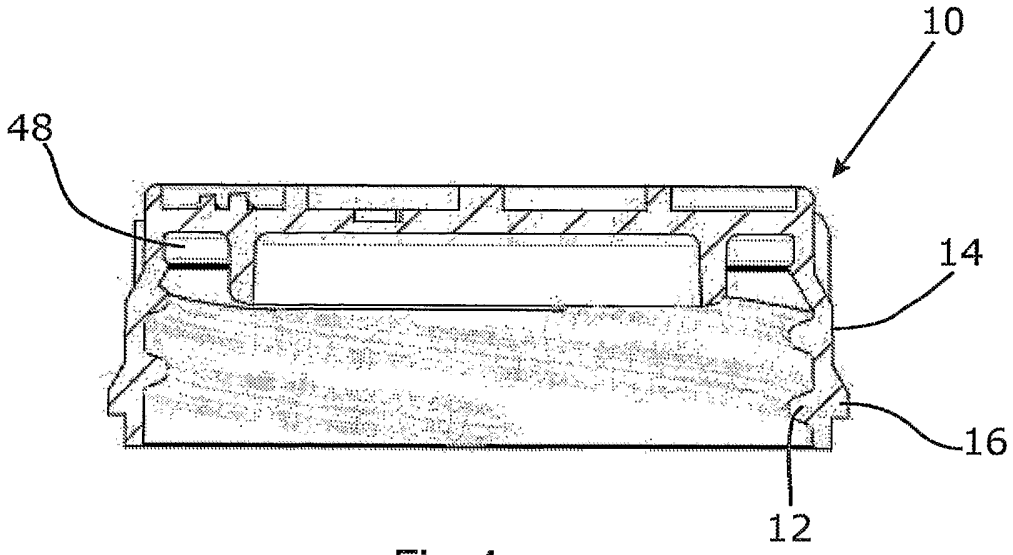


Fig.4

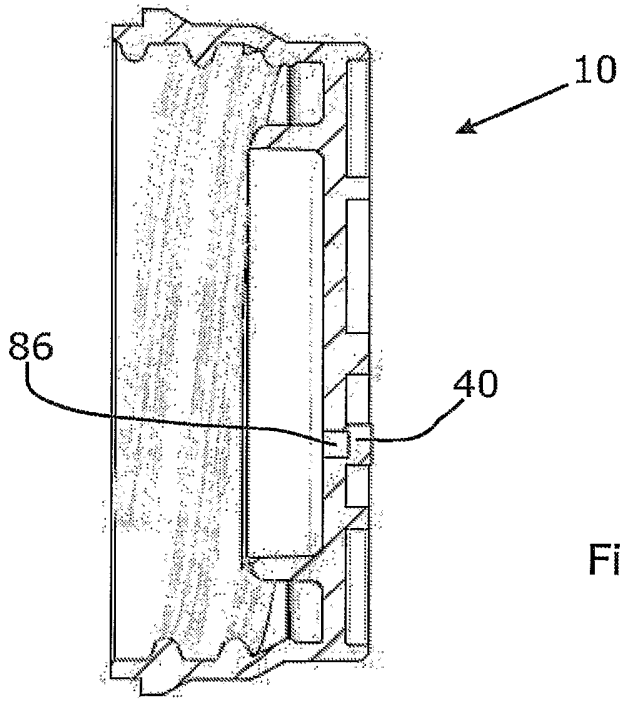


Fig.5

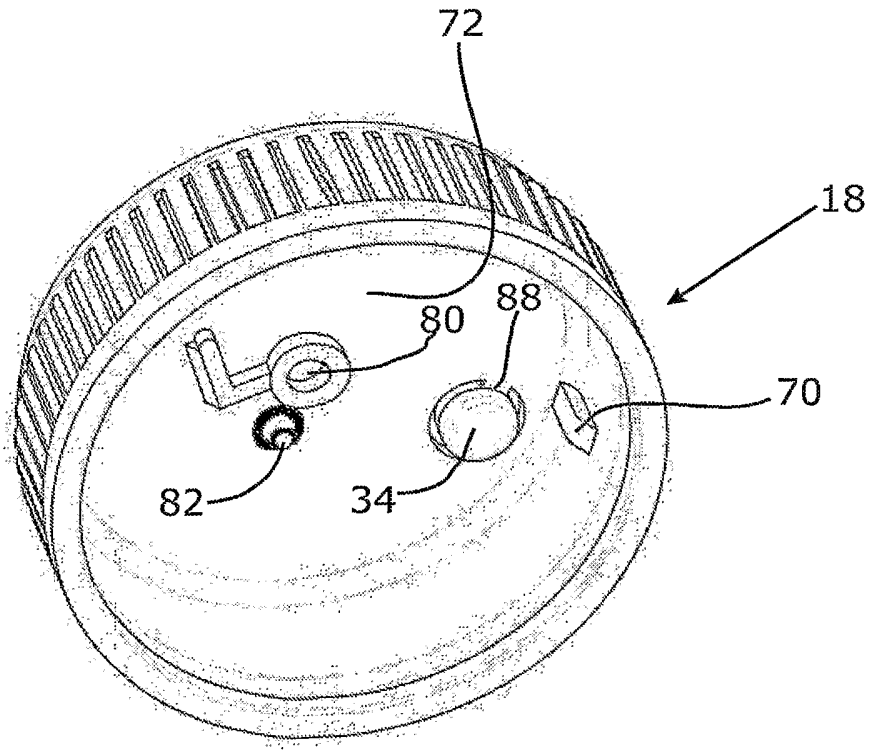


Fig.6

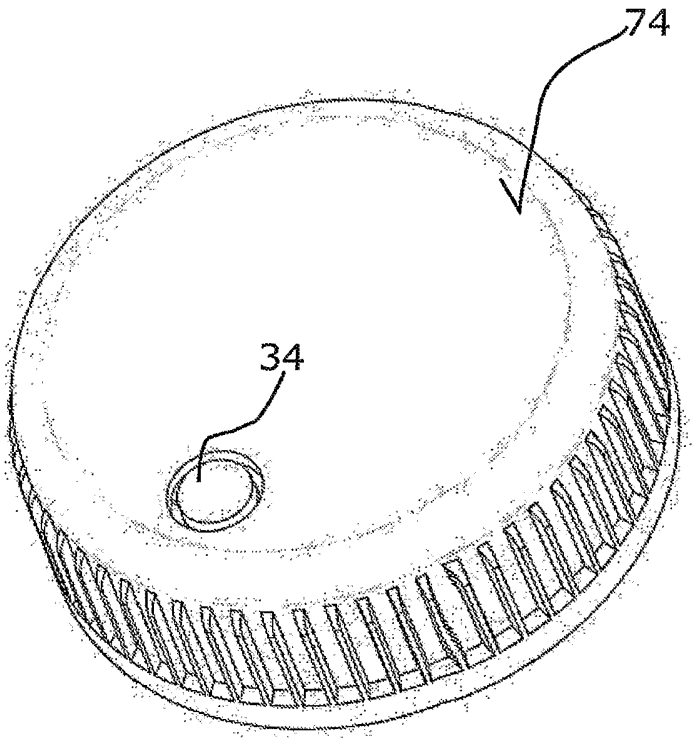


Fig.7

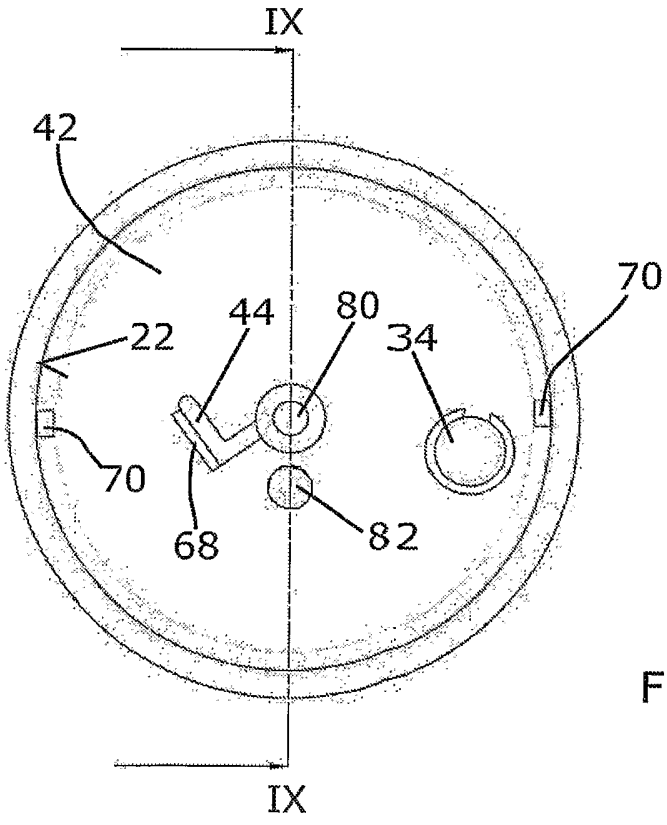


Fig.8

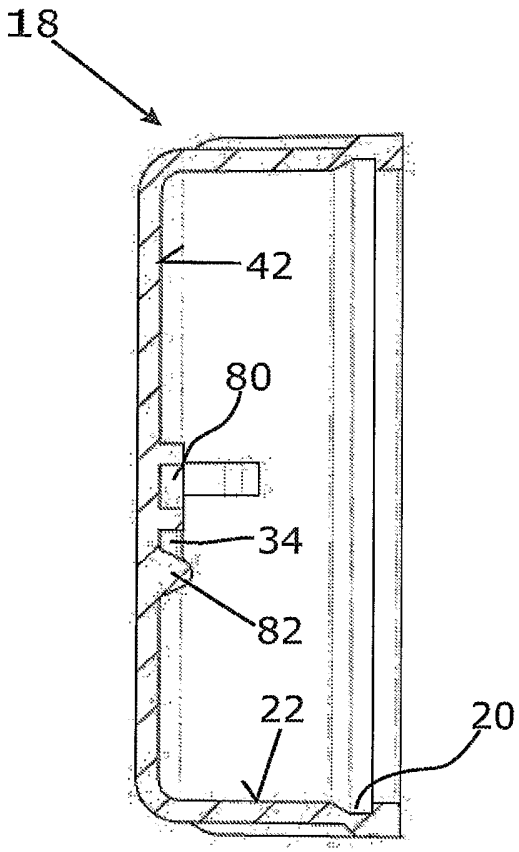


Fig.9

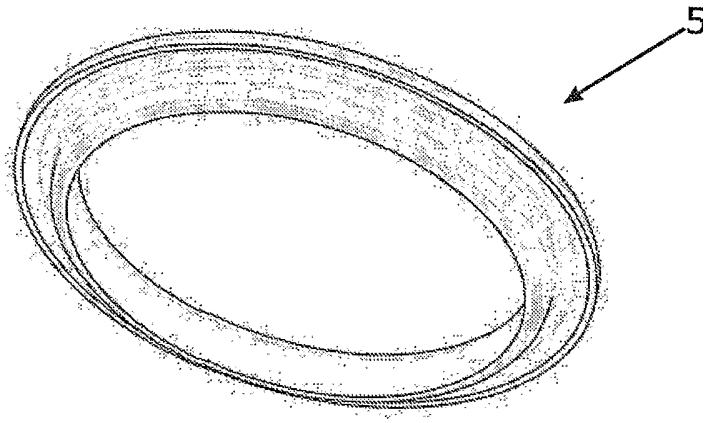


Fig.10

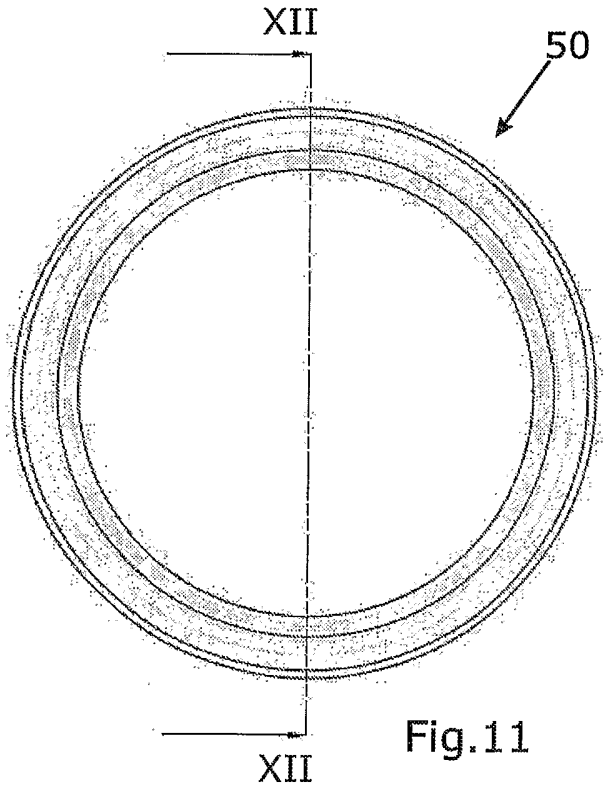


Fig.11

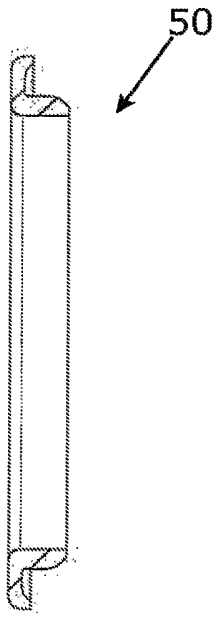


Fig.12

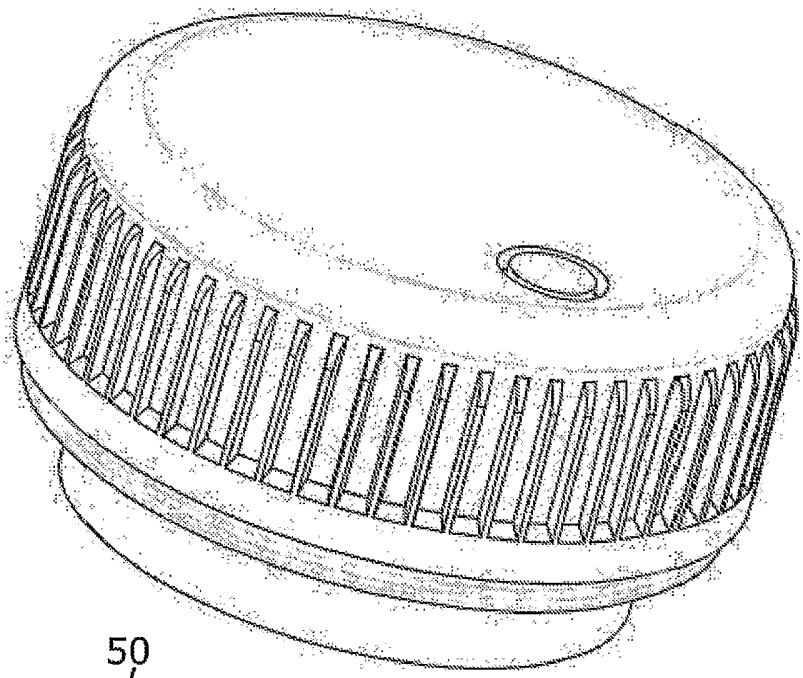


Fig.13

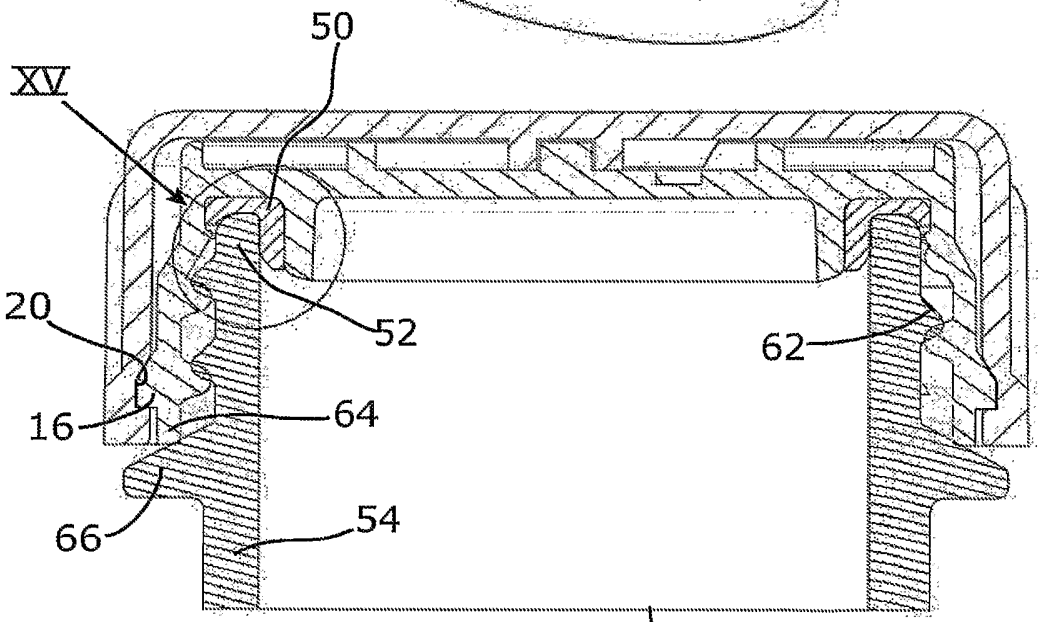


Fig.14

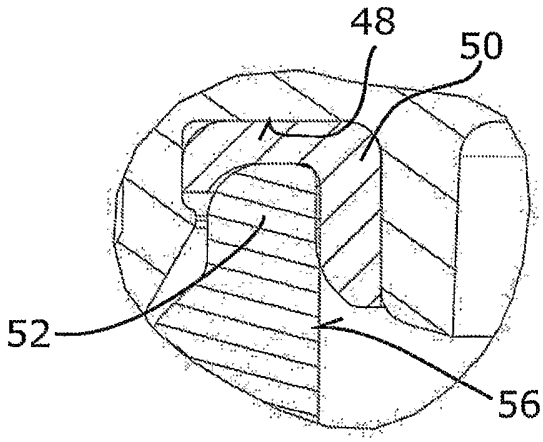


Fig.15

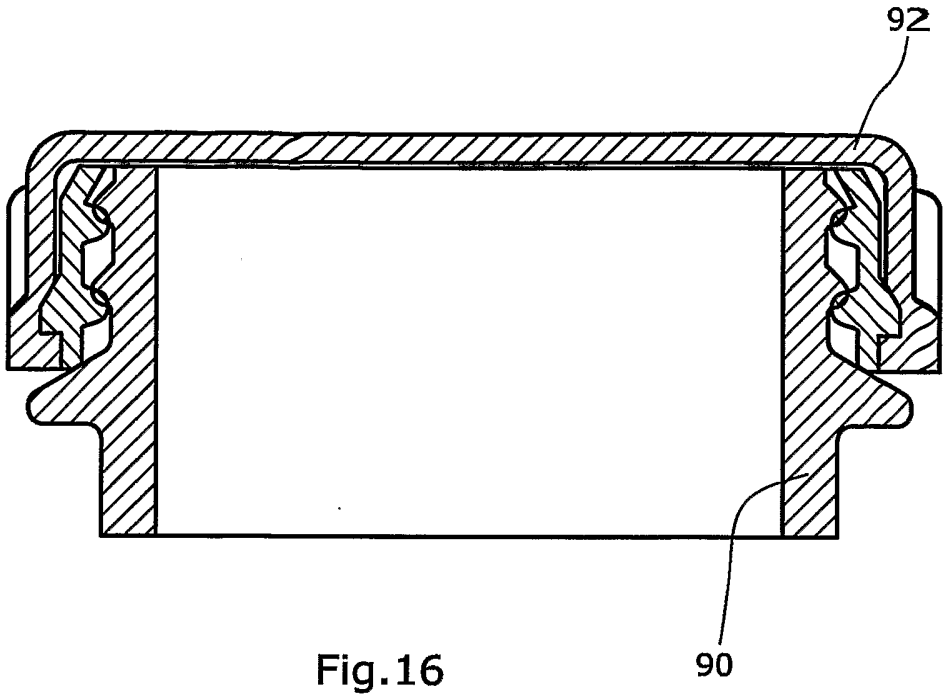


Fig.16

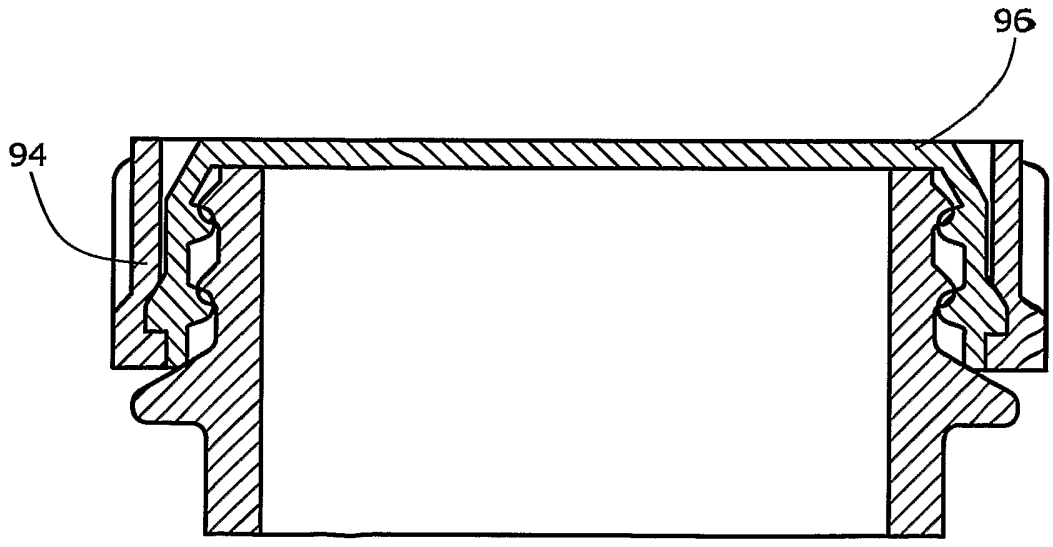
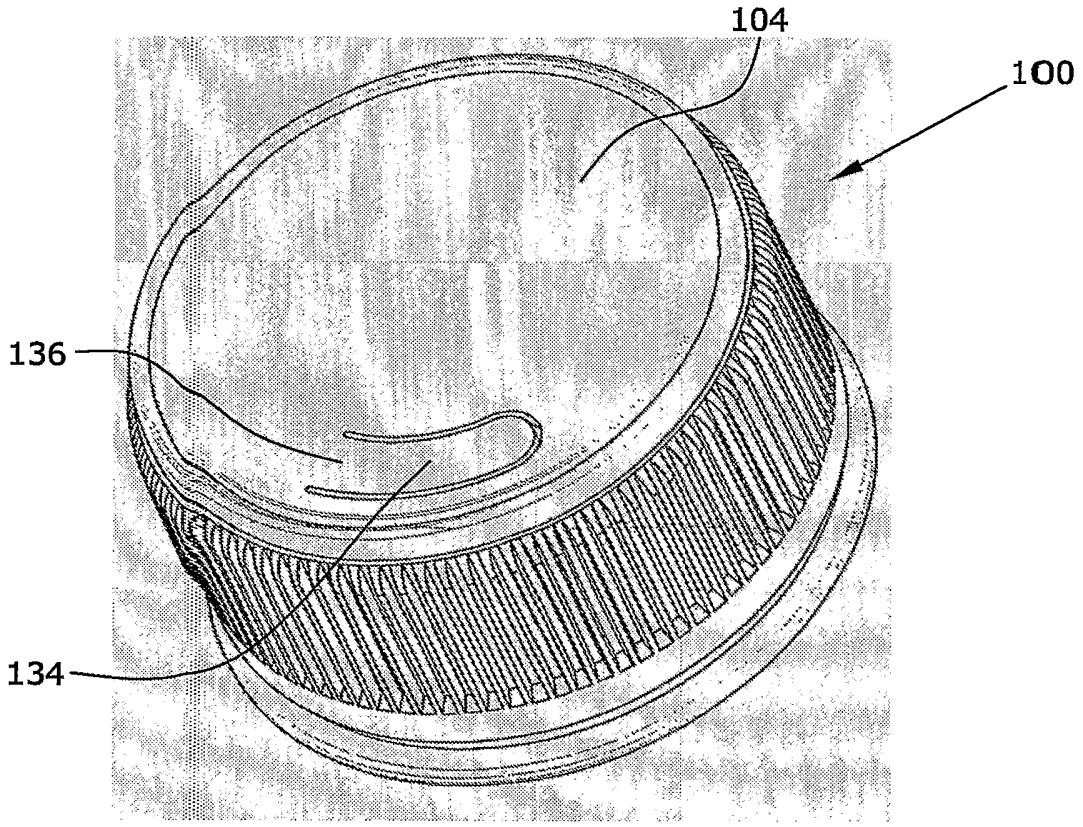


Fig.17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100
136
134

Fig.18

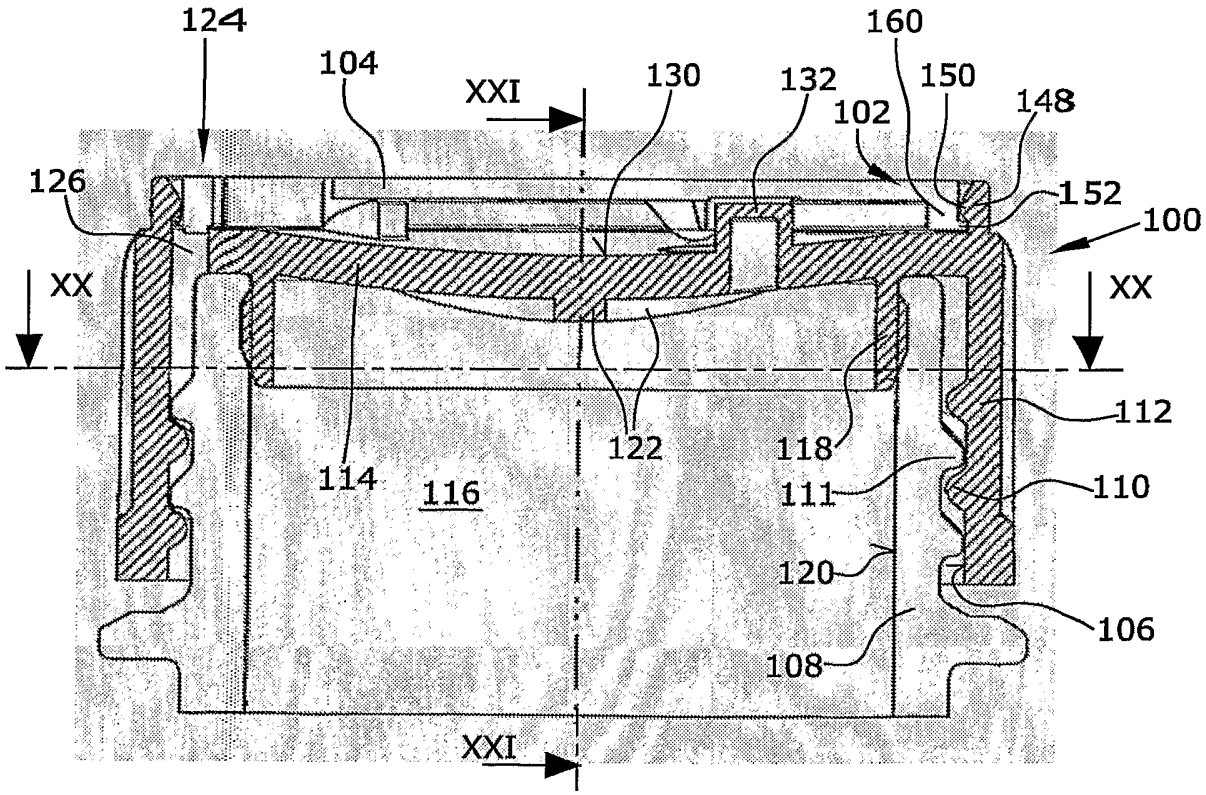
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Fig.19

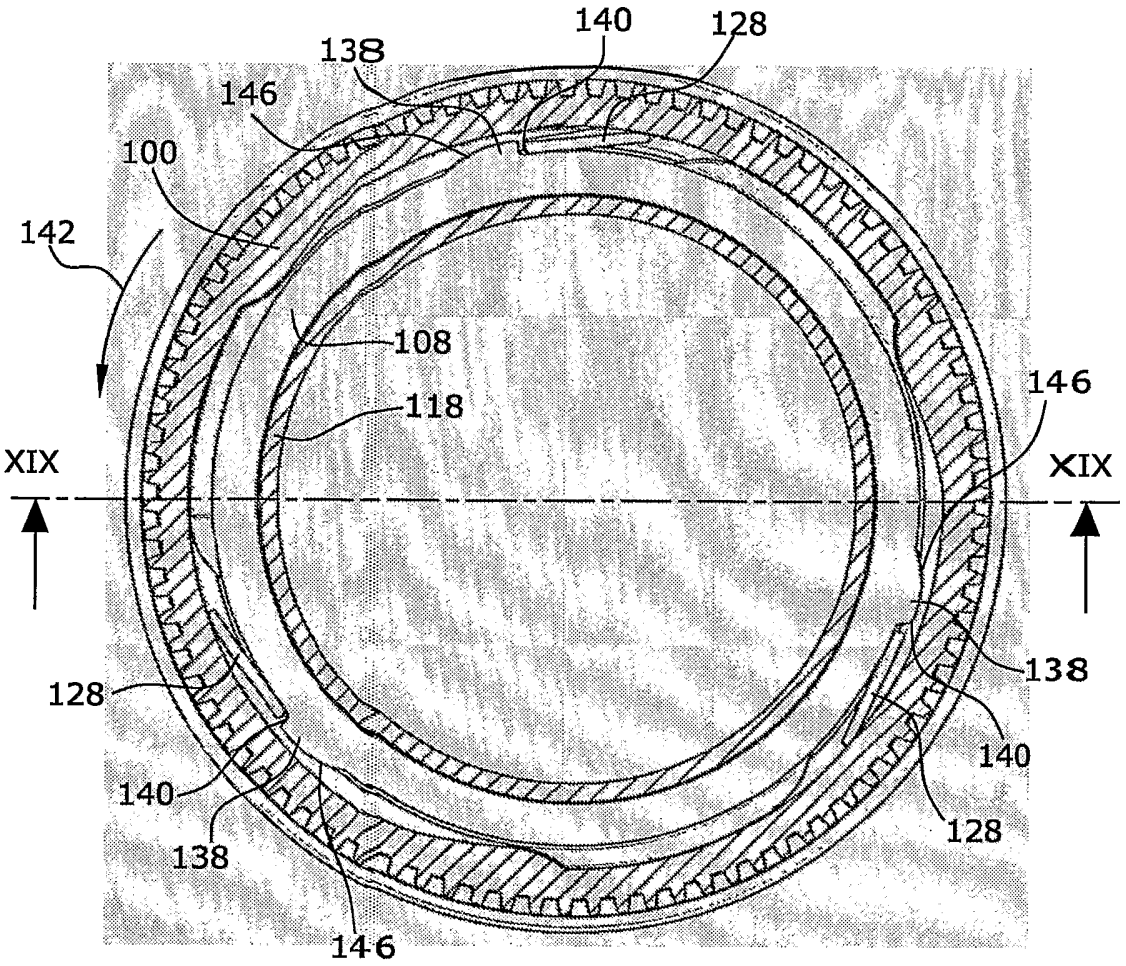
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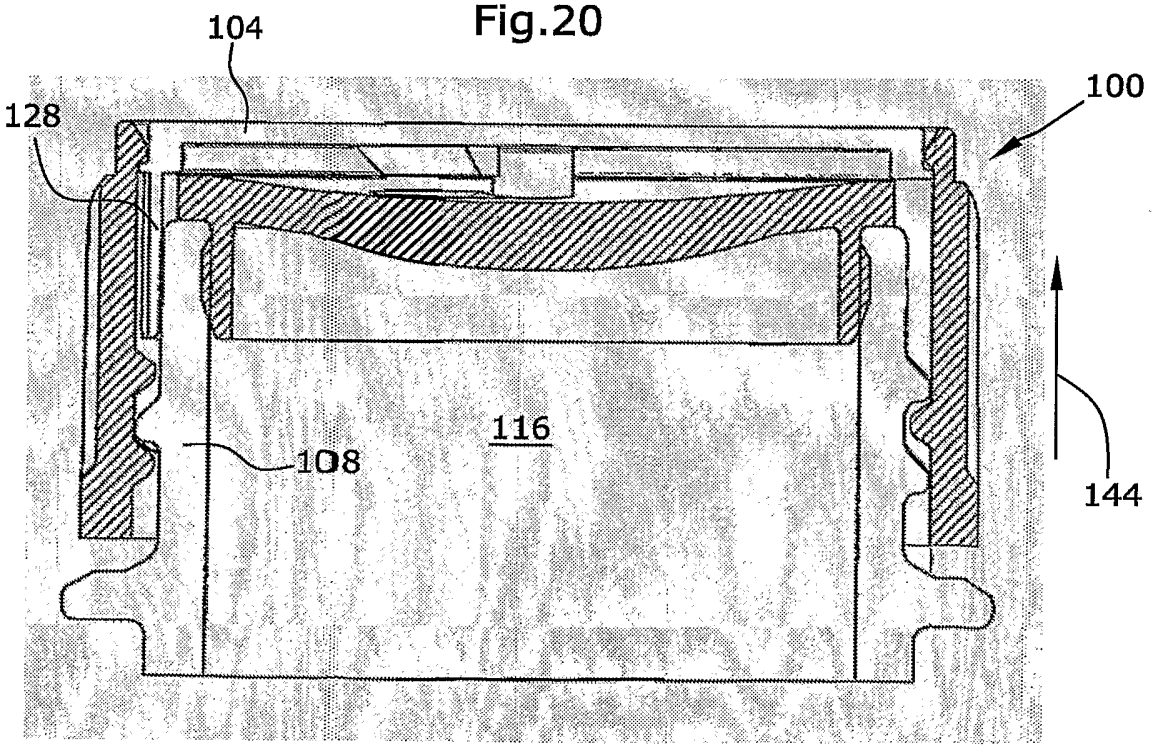
Fig.20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128
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Fig.21

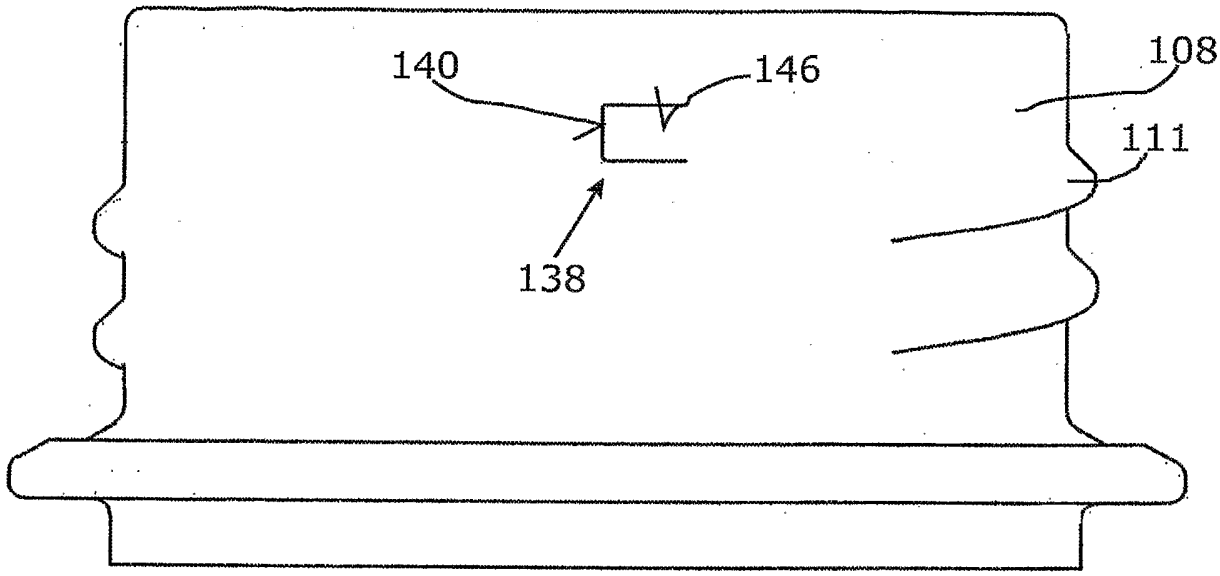

Fig.22

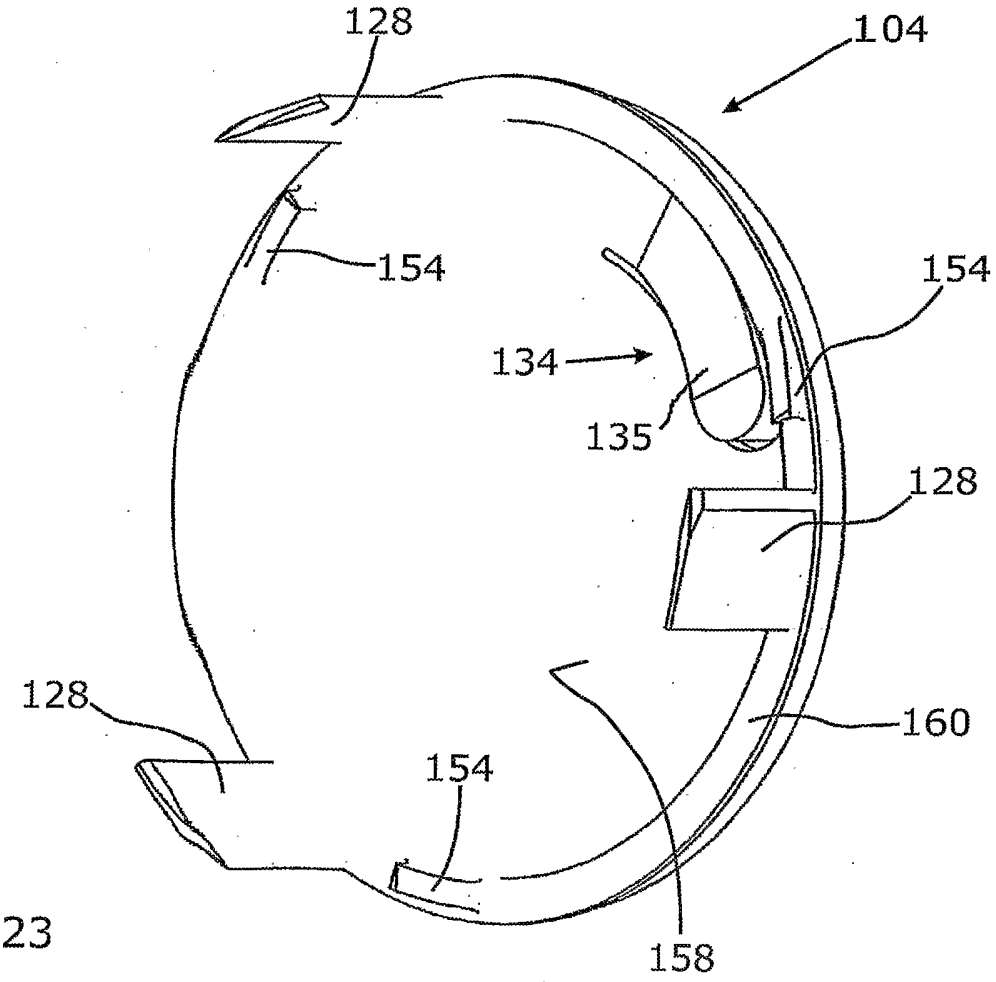

Fig.23

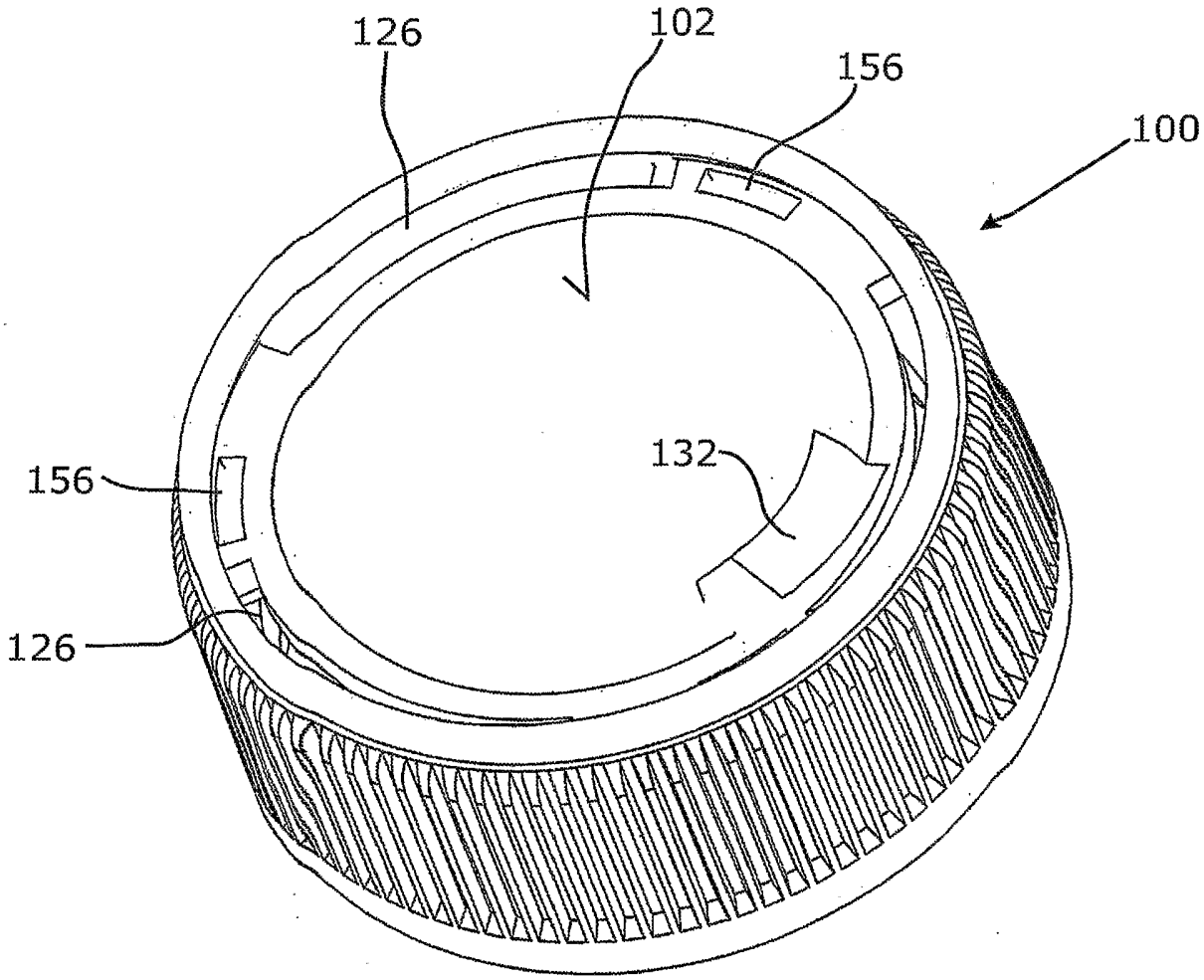

Fig.24