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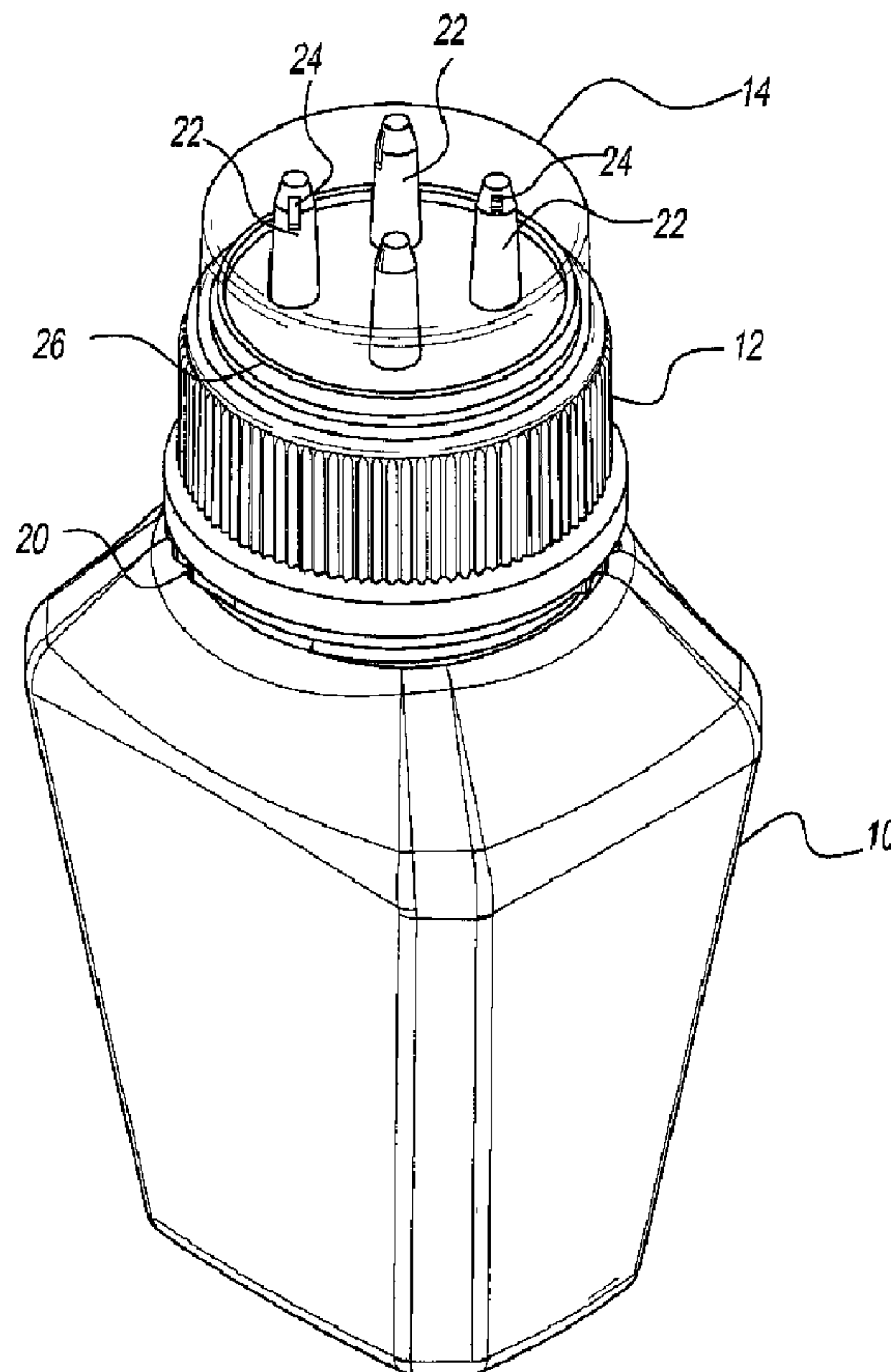
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(57) Abrégé/Abstract:

An injection closure system includes a bottle containing a product to be distributed and a closure attached to the bottle and including nozzles. Each of the nozzles includes two holes through which the product is distributed from the bottle. The bottle



(57) **Abrégé(suite)/Abstract(continued):**

includes a plurality of teeth extending around an outer surface of the bottle and the closure includes a plurality of teeth extending around an inner surface of the closure. When the closure is in a fully attached position on the bottle, the teeth of the bottle contact the teeth of the closure to prevent the closure from being removed from the bottle.

ABSTRACT

An injection closure system includes a bottle containing a product to be distributed and a closure attached to the bottle and including nozzles. Each of the nozzles includes two holes through which the product is distributed from the bottle. The bottle includes a plurality of teeth extending around an outer surface of the bottle and the closure includes a plurality of teeth extending around an inner surface of the closure. When the closure is in a fully attached position on the bottle, the teeth of the bottle contact the teeth of the closure to prevent the closure from being removed from the bottle.

TITLE

INJECTION CLOSURE SYSTEM

BACKGROUND

[0001] The exemplary embodiments described herein are directed to an injection closure system. The system includes a bottle with an injection closure attached thereto.

[0002] Consumers of certain food products such as meat, for example steak, chicken, or fish, frequently add seasoning to their meat prior to cooking. One such seasoning is a liquid marinade. Typically, the consumer will add the marinade by pouring it over the meat and keeping the meat in the marinade for a period of time before cooking.

[0003] However, such conventional ways of seasoning the meat typically will only season the outside of the meat. Even if some of the marinade does reach the inside of the meat, the marinade is not evenly distributed throughout the meat. The result is that different parts of the meat will have different flavor.

SUMMARY

[0004] The exemplary embodiments described herein provide the consumer with a way to evenly distribute marinade within their favorite foods.

[0005] An exemplary injection closure system includes a bottle containing a product to be distributed and a closure attached to the bottle and including nozzles. Each of the nozzles includes two holes through which the product is distributed from the bottle.

[0006] Another exemplary injection closure system includes a bottle containing a product to be distributed and a closure attached to the bottle and including at least one nozzle. The bottle includes a plurality of teeth extending around an outer surface of the bottle and the closure includes a plurality of teeth extending around an inner surface of the closure. When the closure is in a fully attached position on the bottle, the teeth of the bottle contact the teeth of the closure to prevent the closure from being removed from the bottle.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] A more complete appreciation of the invention and many of the attendant advantages thereof will be readily obtained as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

[0008] Figure 1 shows an exemplary embodiment of the bottle with injection closure;

[0009] Figure 2 shows the exemplary embodiment of Figure 1;

- [0010] Figure 3 shows the exemplary embodiment of Figure 1;
- [0011] Figure 4 shows an exemplary injection closure;
- [0012] Figure 5 shows an exemplary injection closure;
- [0013] Figure 6 shows a cross-section of an exemplary embodiment of the bottle with injection closure;
- [0014] Figure 7 shows a portion of an exemplary injection closure;
- [0015] Figure 8 shows a portion of an exemplary bottle;
- [0016] Figure 9 shows another embodiment of a bottle;
- [0017] Figure 10 shows a cross-section of the bottle shown in Figure 9 with another embodiment of a closure;
- [0018] Figure 11 shows a cross-section of the exemplary bottle and closure of Figure 1;
- [0019] Figure 12 shows a cross-section of a neck portion of another exemplary bottle;
- [0020] Figure 13 shows another exemplary injection closure;
- [0021] Figure 14 shows another exemplary injection closure;
- [0022] Figure 15 shows another exemplary injection closure;
- [0023] Figure 16 shows an exemplary embodiment of the components of an injection closure system;
- [0024] Figure 17 shows another exemplary embodiment of the components of an injection closure system;
- [0025] Figure 18 shows an exemplary embodiment of the injection closure system in the removable position; and
- [0026] Figure 19 shows an exemplary embodiment of the injection closure system in the non-removable position.

DETAILED DESCRIPTION

[0027] Referring now to the drawings, wherein like reference numerals designate identical or corresponding parts throughout the several views, Figure 1 shows an exemplary embodiment of an injection closure system. The system includes a bottle 10 with a closure 12 attached thereto. As described more fully below, the closure 12 can be screwed onto the bottle 10. A removable overcap 14 is positioned on the closure 12.

[0028] Figure 2 shows a view of the exemplary embodiment of Figure 1 with the closure 12 and overcap 14 removed from the bottle. A fitment 16 is positioned on an opening in a neck of the bottle 10 and includes a seal to close the opening of the bottle 10 in order to keep the contents of the bottle 10 fresh and provide leak resistance for the bottle 10. The seal is an

induction seal inserted into the fitment 16. Figure 17 shows an exploded view of the bottle 10, fitment 16, closure 12, and overcap 14.

[0029] In an alternative embodiment, the fitment 16 could have a plug seal that is inserted into the neck of the bottle 10 to seal the opening, as shown in Figure 6. Figure 16 shows an exploded view of the bottle 10, fitment 16, closure 12, and overcap 14 of Figure 6.

[0030] The fitment 16 is snapped over a bead at the top of the neck of the bottle 10. The fitment 16 can be attached to the bottle 10 by either being inserted up into the closure 12 and applied during capping when the closure 12 is torqued onto the bottle 10 in a capper or it could be applied separately to the bottle 10 by a fitment applicator prior to capping.

[0031] The closure 12 includes angled teeth 18 extending around an inside surface thereof, as shown in Figure 5. An exemplary embodiment of the some of the teeth 18 on the inside surface of the closure 12 is shown in Figure 7. Figure 7 shows exemplary angles, length, and pitch for the teeth 18 of the closure 12. The bottle 10 includes angled teeth 20 extending around an outside surface thereof. A top view of a neck portion of the bottle 10 is shown in Figure 12. An exemplary embodiment of the some of the teeth 20 on the outside surface of the bottle 10 is shown in Figure 8. Figure 8 shows exemplary angles, length, and pitch for the teeth 20 of the bottle 10. In an exemplary embodiment, the bottle 10 could include two separate sets of seven teeth 20 positioned on opposite sides of the outside surface thereof. Alternatively, the teeth 20 could extend all of the way around an outside surface of the bottle 10.

[0032] When the fitment 16 is positioned on the opening of the bottle 10 as shown in Figure 2, the closure 12 can only be partially screwed onto the bottle 10, as shown in Figure 1. The thickness of the fitment 16 prevents the closure 12 from being screwed far enough onto the bottle 10 for the teeth 18 of the closure 12 to contact the teeth 20 of the bottle 10. As seen in Figure 2, a ring portion of the fitment 16 extends from a top of the neck of the bottle 10 to prevent the teeth 18 of the closure 12 from contacting the teeth 20 of the bottle 10. Thus, the closure 12 is in the removable position (see Figure 18) such that the consumer is unable to lock the closure 12 onto the bottle 10, as described further below, with the fitment 16 still attached to the bottle 10.

[0033] The fitment 16 is removed from the bottle 10 by lifting up along the edge of the fitment 16. A gap between the edge of the fitment 16 and an edge of the bottle 10 is wide enough between the fitment 16 and the neck of the bottle 10 to get a finger under and lift.

[0034] After the fitment 16 is removed from the bottle 10 by the consumer, the closure 12 can be fully screwed onto the bottle 10 (i.e. reach a fully attached position shown in Figure 3)

such that the teeth 18 of the closure 12 contact the teeth 20 of the bottle 10. The teeth 18, 20 are angled as discussed above such that they slide over one another when the closure 12 is being screwed onto the bottle 10 and contact one another when the user attempts to unscrew the closure 12 from the bottle 10.

[0035] The teeth 18, 20 act as a non-removable locking feature by contacting one another, as shown in Figure 11, to prevent the user from unscrewing the closure 12 from the bottle 10. When the closure 12 is fully screwed onto the bottle 10 such that the teeth 18, 20 prevent the removable of the closure 12 from the bottle, the closure 12 is in a non-removable position (see Figure 19). Because of the non-removable locking feature, in an exemplary embodiment, the consumer will not be able to refill the bottle 10 such that the bottle 10 will be discarded after it has been used. This prevents the consumer from re-using the bottle after the closure has been in contact with raw meat products, as discussed further below.

[0036] In an alternative embodiment, the teeth 20 can be positioned around an inside surface of the neck of the bottle 10, as shown in Figure 9. The teeth 18 can extend outwardly from a ring within the closure 12, as shown in Figure 10. With the teeth 20 being positioned within the bottle 10 in this embodiment, the fitment 16 would prevent the teeth 18 of the closure 12 from contacting the teeth 20 of the bottle 10 while the fitment 16 is in place on top of the neck of the bottle 10. However, when the fitment 16 is removed and the closure 12 is screwed onto the bottle 10, the teeth 18, 20 again act as a non-removable locking feature by contacting one another to prevent the user from unscrewing the closure 12 from the bottle 10.

[0037] As shown in greater detail in Figure 4, the closure 12 has four built-in injector nozzles 22. The product within the bottle 10 is dispensed through the injector nozzles 22 of the closure 12. The injector nozzles 22 are tapered to allow the nozzles 22 to pierce the food into which the product in the bottle 10 is to be injected. Each nozzle 22 is tapered such that a width of the nozzle continuously decreases from a base of the nozzle to a tip of the nozzle.

[0038] In the exemplary embodiment shown in Figure 4, each nozzle 22 includes a tip portion which has a greater taper than the rest of the nozzle. The tip portion ends in a flat surface that extends radially from an axis of the nozzle 22 and the holes 24 are not located within the flat surface to prevent clogging. In an alternative embodiment, the tip portion could taper down to a point (Figure 13) or the flat surface could be angled (Figure 14) relative to the axis of the nozzle such that it does not extend radially. Alternatively, the entire nozzle could have a constant taper down to a point or a flat surface (Figure 15).

[0039] In an exemplary embodiment, the product within the bottle 10 can be a wet sauce, for example a marinade, which is injected into food, for example steak or chicken, for enhancing

the flavor of the food. By injecting the marinade into the meat, the bottle 10 with injection closure 12 allows for the meat to marinate from the inside out. The nozzles 22 are sized to prevent the nozzle 22 from passing through a standard cut of meat so that the product will not be injected out of the other side of the meat. In a preferred embodiment, the nozzles 22 are each from 0.4375" to 0.625" long, and more preferably are 0.528" long. However, the length of each nozzle could be re-sized for different cuts of meat. For example, an injection closure system designed to be used with thin cuts of meat, such as chicken cutlets or pork chops, would have shorter nozzles than an injection closure system designed to be used with a rotisserie chicken or whole turkey.

[0040] The injector nozzles 22 each have an interior channel 28 (see Figure 5) that leads to two holes 24 at a specific placement in the nozzle 22 to allow product to be dispensed from the nozzles 22 into the meat. The holes 24 are positioned on a side of the nozzles 22 so that the meat does not clog the holes 24, thereby preventing the product from being dispensed from the nozzles 22. On each nozzle 22, one of the holes 24 is larger than the other hole 24. The smaller of the two holes 24 is sized to allow passage of the product without the product clogging in the hole and the bigger of the two holes 24 is sized to prevent the product from spilling out of the nozzle 24 in a larger amount than desired. Additionally, one of the holes 24 is positioned on an opposite side of the nozzle 22 from the other hole 24 (i.e., 180° apart) and neither hole is facing towards a center of the closure. The holes 24 are positioned at a same height along the nozzle 22. Further, the holes 24 are positioned such that the large hole 24 from one of the nozzles 22 is closer to the small hole 24 from the closest nozzle 22 than the large hole 24 of that closest nozzle 22.

[0041] The width of the channel 28 in each nozzle 22 is important to control the flow of the liquid product when the bottle 10 is squeezed as the channel width also effects the flowability of the product. When the channel 28 is too wide, the product pours out too fast. When the channel 28 is too small, the product clogs similar to the hole sizes. In an exemplary embodiment, the preferred inside diameter range of the channel is 0.115" to 0.140". The preferred holes sizes are: for both large and small, width ranges from 0.035" to 0.050" (more preferably 0.040"). The small hole length preferably ranges from 0.050" to 0.060" (more preferably .050") and the large hole length preferably ranges from 0.050" to 0.150" (more preferably 0.125").

[0042] The number, size, and arrangement of the nozzles 22 and holes 24 allows for uniform distribution of the product from the closure 12 into the meat. The sizes of the channel 28 and holes 24 can be determined based on the product contained in the bottle 10.

[0043] In an alternative exemplary embodiment, the closure can include fewer or greater than four nozzles and each nozzle can include one hole or more than one hole, and the size and positioning of each hole can be different than the above-described embodiment. For example, each nozzle can include two holes 90° apart or each nozzle can include three holes placed at different heights along the nozzle. Changing the number, size, and arrangement of the nozzles 22 and holes 24 will alter the distribution of the product.

[0044] In the exemplary embodiment shown in Figures 1-4, the closure 12 includes a ring 26 surrounding the nozzles 22 such that each nozzle 22 is positioned within the ring 26. The ring 26 is raised from the top surface of the closure 12 to help reduce splashing of the product from between the closure 12 and the meat. In an alternative embodiment, the ring 26 can be omitted from the closure 12.

[0045] Next, an exemplary method for using the bottle with injection closure is described.

[0046] When the consumer purchases the injection closure system shown in Figures 1-4, the consumer will unscrew the closure 12 from the bottle 10 and remove the fitment 16. After the fitment 16 is removed, the closure 12 is screwed onto the bottle 10 until the teeth 18 of the closure 12 overlap with the teeth 20 of the bottle 10 such that the closure 12 is no longer removable from the bottle 10 by unscrewing. The overcap 14 is removed from the closure 12 and then the nozzles 22 are inserted into the food. The bottle 10 is then squeezed to force the product out of the holes 24 of the nozzles 22 and into the food. The consumer then removes the nozzles 22 from the food and, when the nozzle 22 has contacted raw meat, discards the bottle 10 and closure 12 due to contamination. Thus, the injection closure system can be for a one-time use. Alternatively, when the nozzles 22 have not been in contact with raw meat, the consumer can replace the overcap 14 on the closure 12 for storage.

[0047] As can be seen in the drawings, the bottle 10 is tapered such that the bottle 10 increases in size from the bottom to a shoulder portion thereof and then decreases in size from the shoulder portion to the neck. This shape of bottle 10 allows the consumer to easily grasp the bottle 10 to insert the nozzles 22 into meat and squeeze the bottle 10 to dispense product therefrom.

[0048] In an exemplary embodiment, the bottle preferably holds from 2 oz. to 6 oz., more preferably 4 oz, of the product. As noted above, the product can be a marinade or another liquid flavor.

[0049] In an exemplary embodiment, the bottle 10 material is made from low-density polyethylene (LDPE) for easy squeezing. The overcap 14 is clear polypropylene (PP). In an alternative embodiment, the overcap 14 is polyethylene terephthalate (PET). The fitment 16

is either LDPE or high-density polyethylene (HDPE), and the injection closure 12 is PP. All elements of the injection system can be injection molded, with the bottle 10 being injection blow molded or extrusion blow molded.

[0050] It should be appreciated that the present disclosure is not limited to the exemplary embodiments shown and described above. Instead, various alternatives, modifications, variations and/or improvements, whether known or that are, or may be, presently unforeseen, may become apparent. Accordingly, the exemplary embodiments, as set forth above are intended to be illustrative, not limiting. The various changes may be made without departing from the spirit and scope of the disclosure. Therefore, the systems and methods according to the exemplary embodiments are intended to embrace all now known or later-developed alternatives, modifications, variations and/or improvements.

CLAIMS:

1. An injection closure system, comprising
 - a bottle containing a product to be distributed; and
 - a closure attached to the bottle and including nozzles, each of the nozzles including two holes through which the product is distributed from the bottle.
2. The injection closure system of claim 1, further comprising:
 - a removable fitment positioned between the bottle and the closure,
 - wherein the removable fitment prevents the closure from reaching a fully attached position on the bottle.
3. The injection closure system of claim 1, wherein
 - the bottle includes teeth extending outward from an outer surface of the bottle, and
 - the closure includes teeth extending inward from an inner surface of the bottle.
4. The injection closure system of claim 3, wherein when the closure is in a fully attached position on the bottle, the teeth of the bottle contact the teeth of the closure to prevent the closure from being removed from the bottle.
5. The injection closure system of claim 1, further comprising:
 - a removable overcap positioned on the closure.
6. The injection closure system of claim 1, wherein the system includes four of the nozzles.
7. The injection closure system of claim 1, wherein each of the nozzles has a tapered shape such that a diameter of the nozzle decreases from a base of the nozzle to a tip of the nozzle.
8. An injection closure system, comprising
 - a bottle containing a product to be distributed, the bottle including a plurality of teeth extending around an outer surface of the bottle; and
 - a closure attached to the bottle and including at least one nozzle, the closure including a plurality of teeth extending around an inner surface of the closure,

wherein when the closure is in a fully attached position on the bottle, the teeth of the bottle contact the teeth of the closure to prevent the closure from being removed from the bottle.

9. The injection closure system of claim 8, further comprising:

a removable fitment positioned between the bottle and the closure,

wherein the removable fitment prevents the closure from reaching the fully attached position on the bottle.

10. The injection closure system of claim 8, further comprising:

a removable overcap positioned on the closure.

11. The injection closure system of claim 8, wherein the nozzle includes two holes through which product is distributed from the bottle.

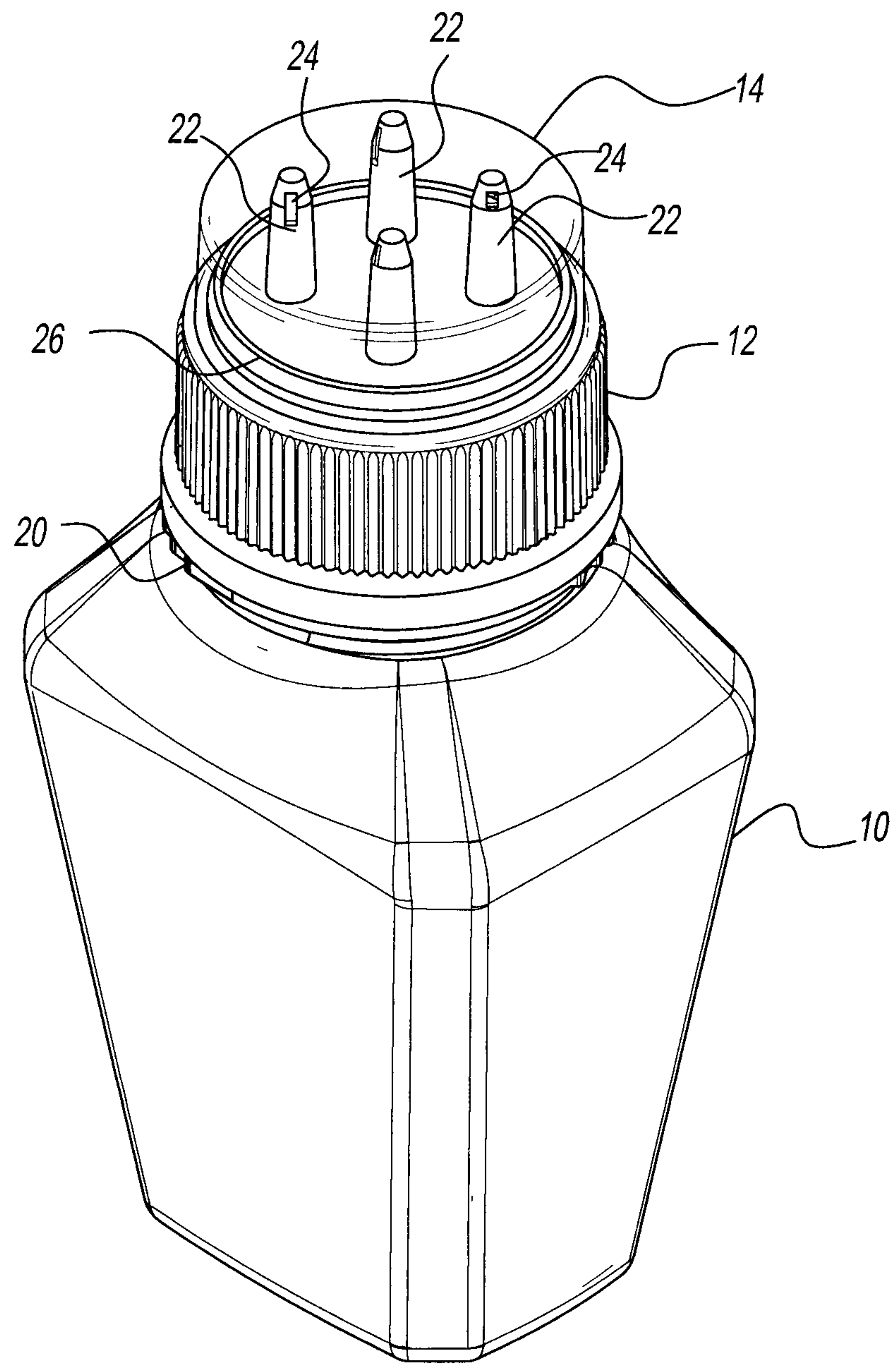


FIG. 1

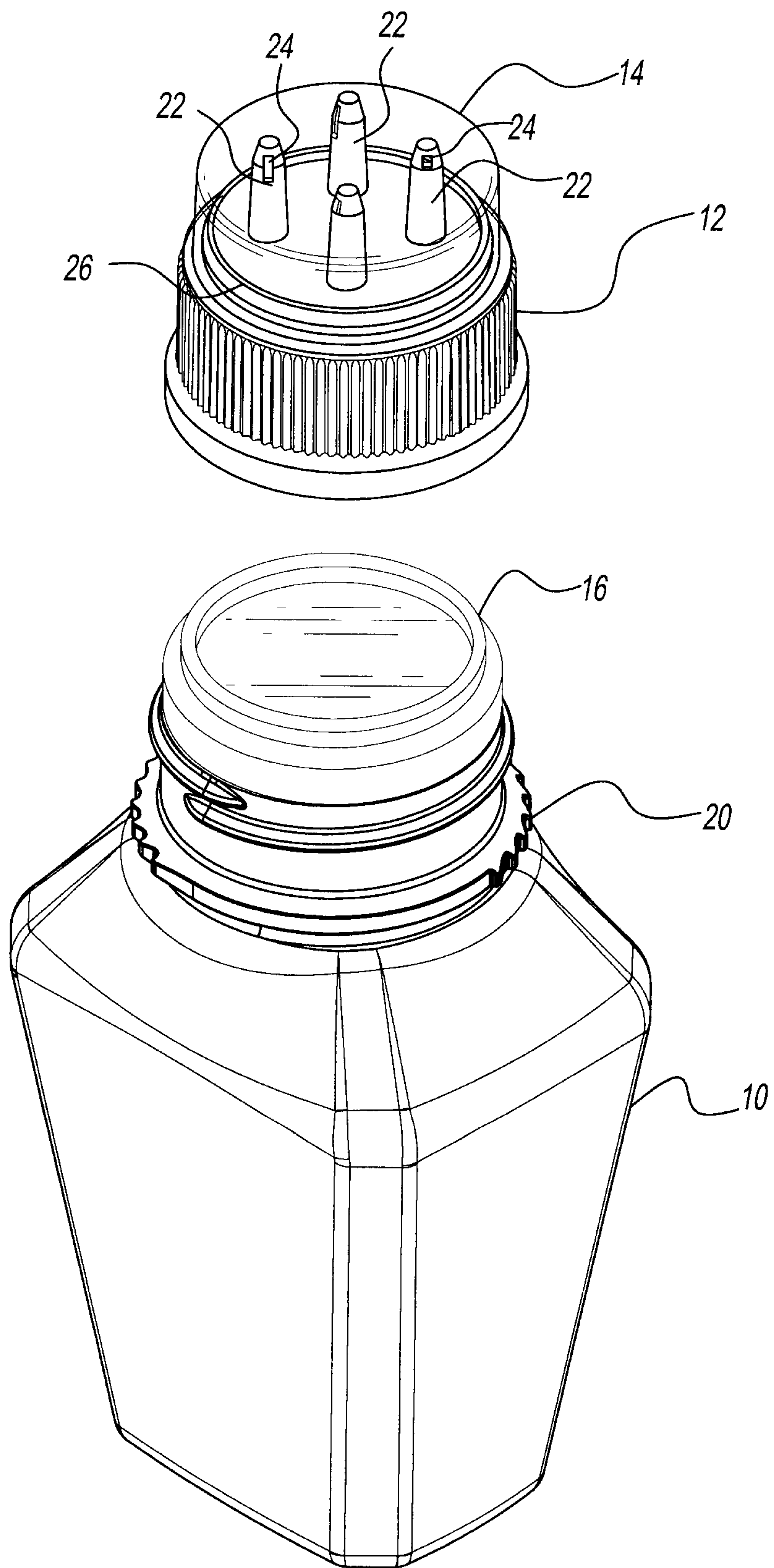


FIG. 2

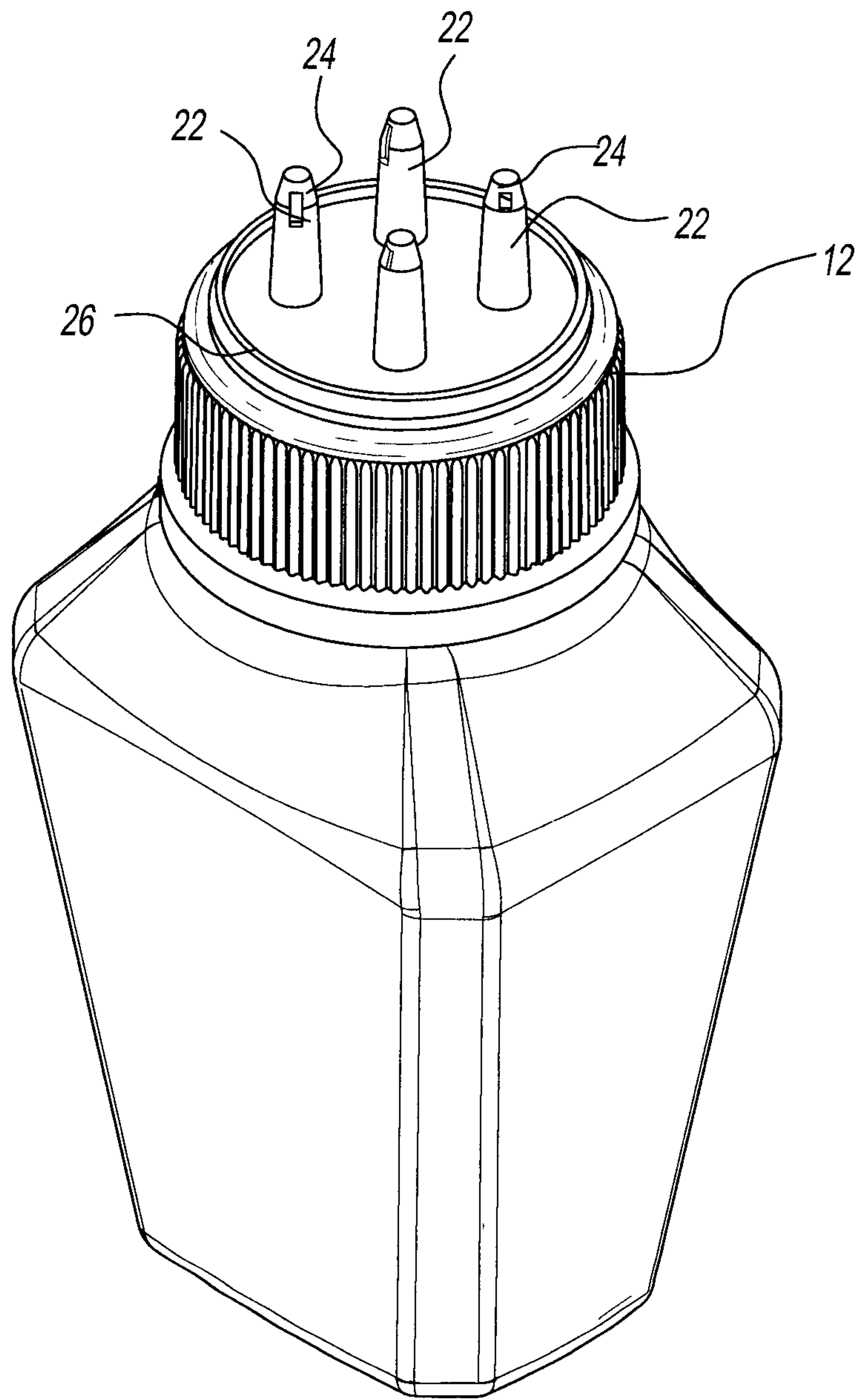


FIG. 3

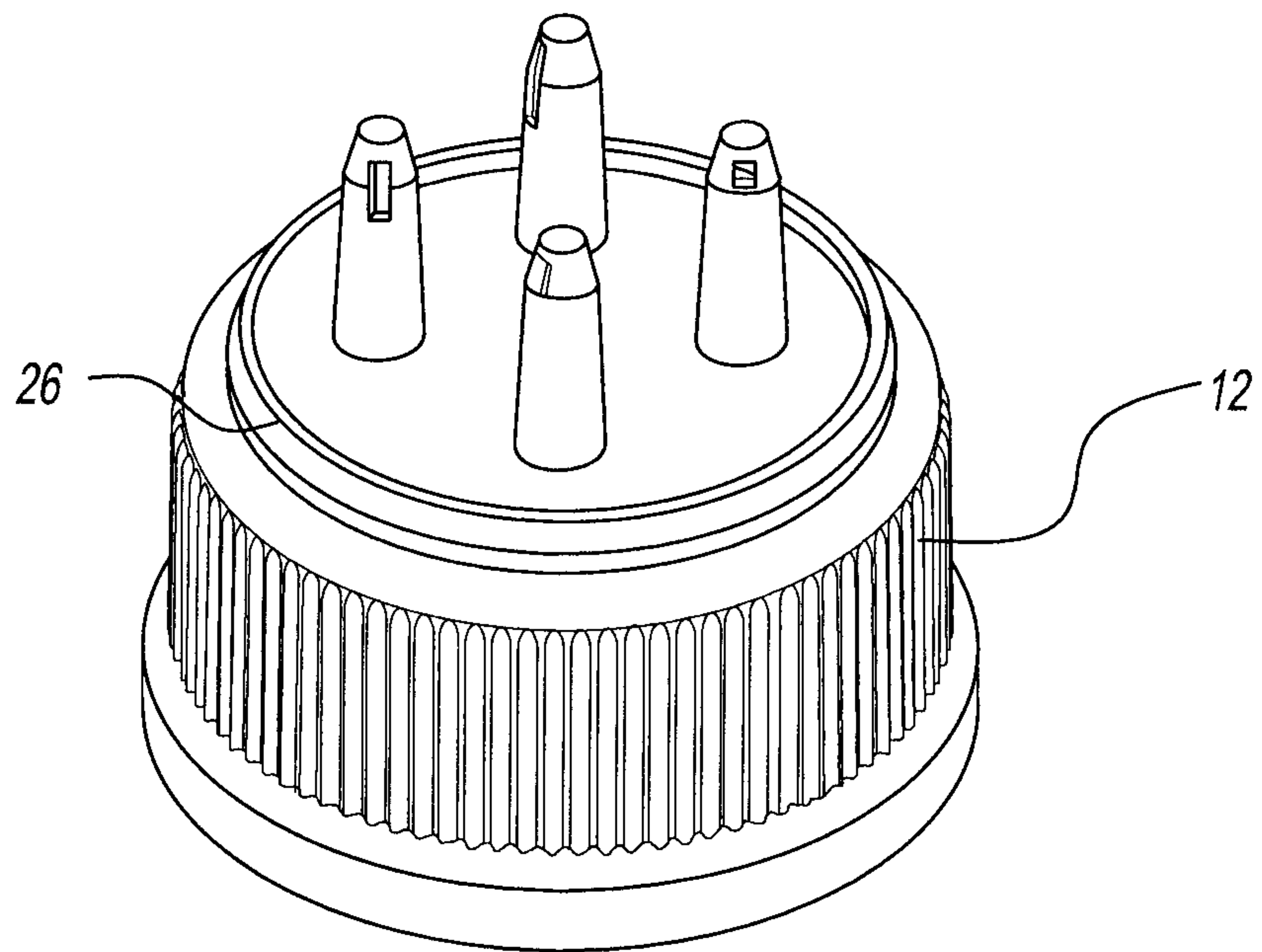


FIG. 4

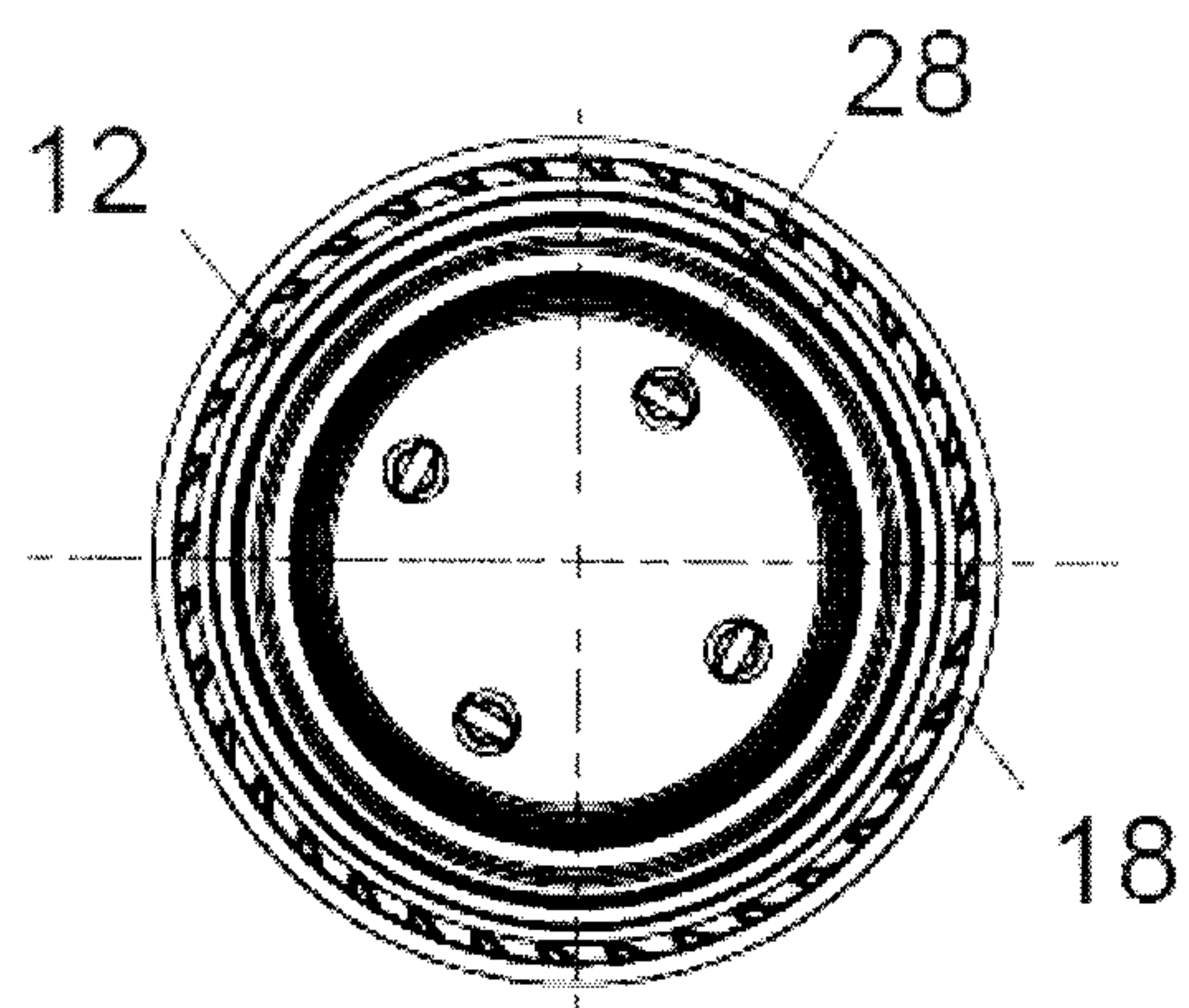


Fig. 5

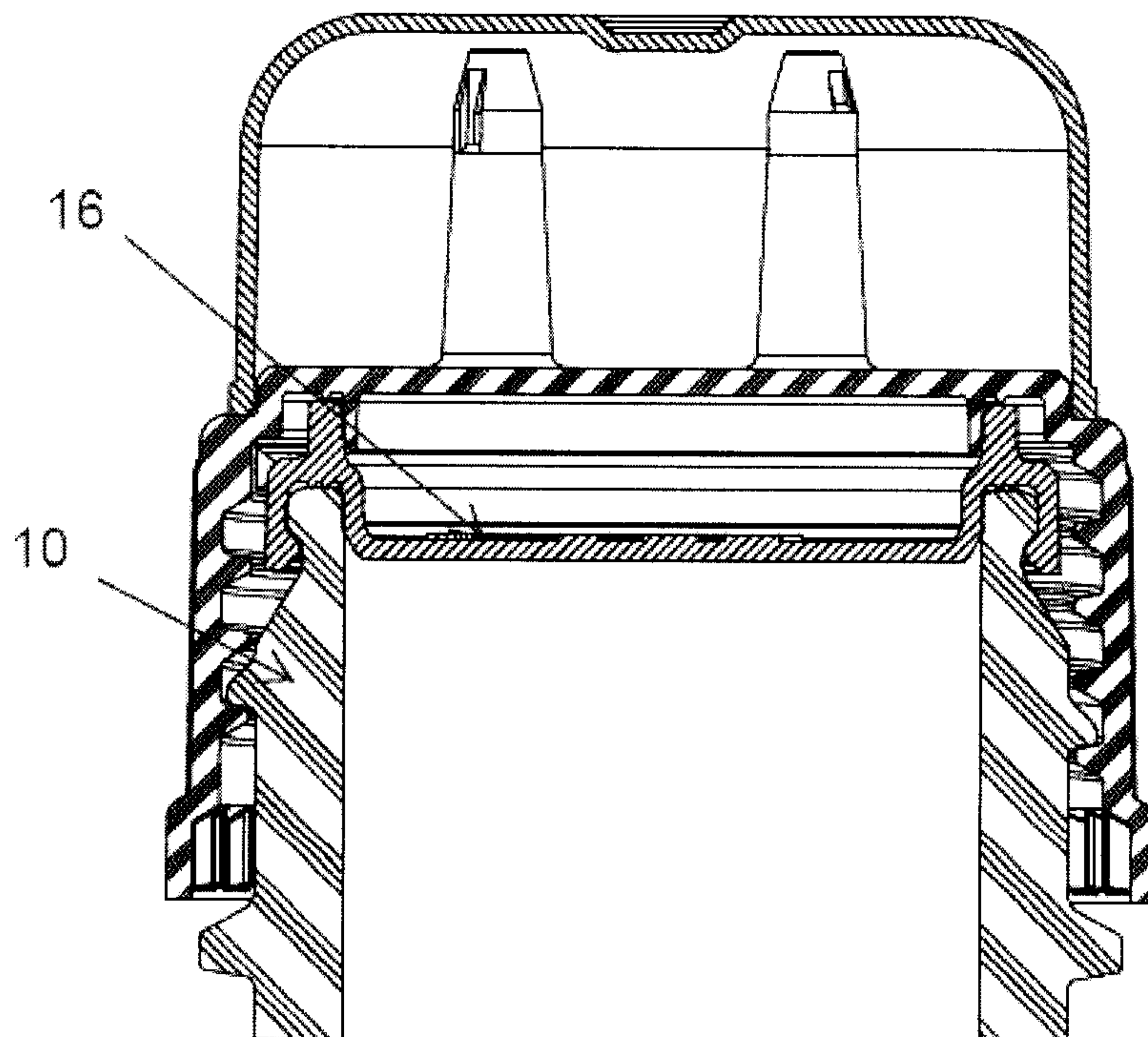


Fig. 6

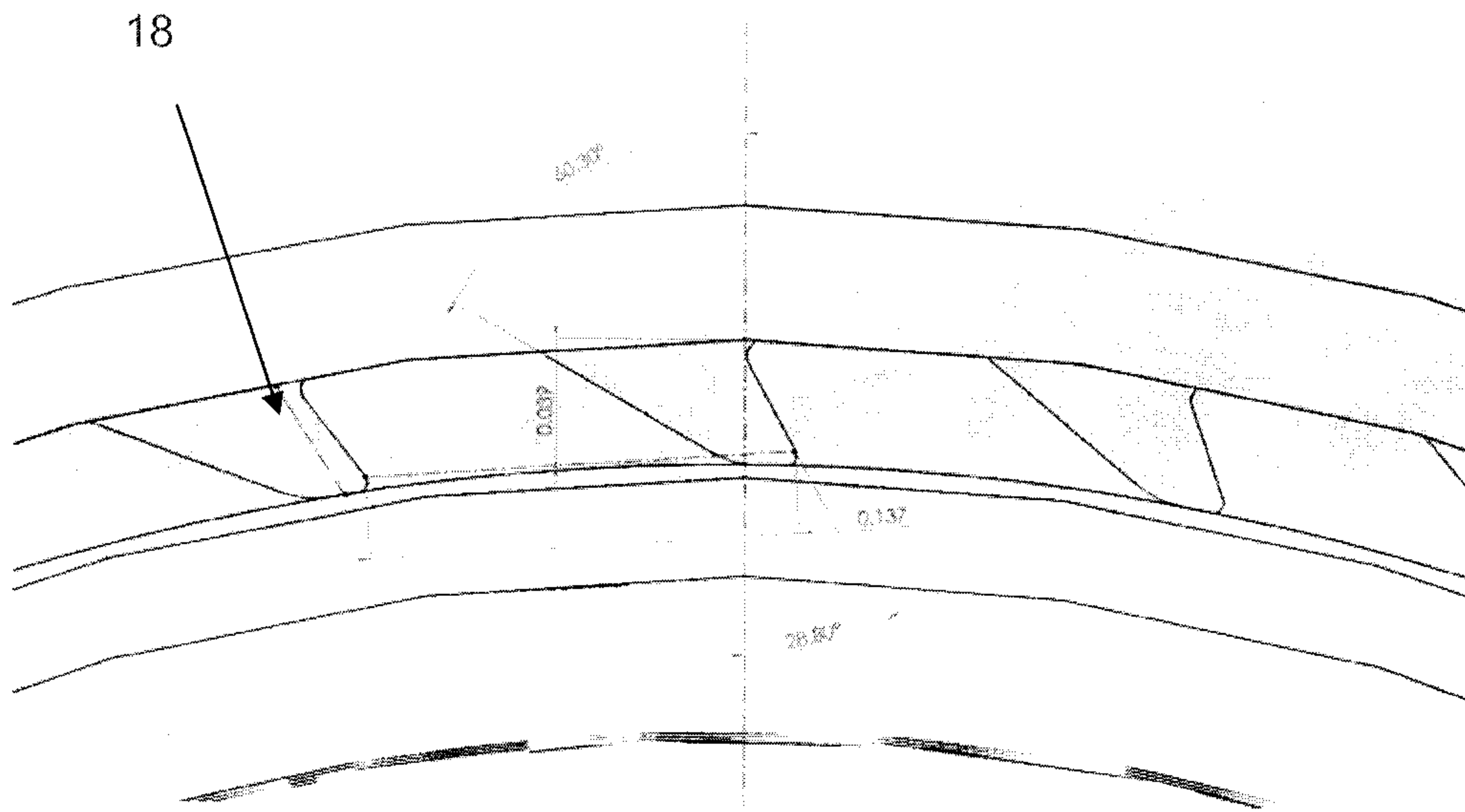


Fig. 7

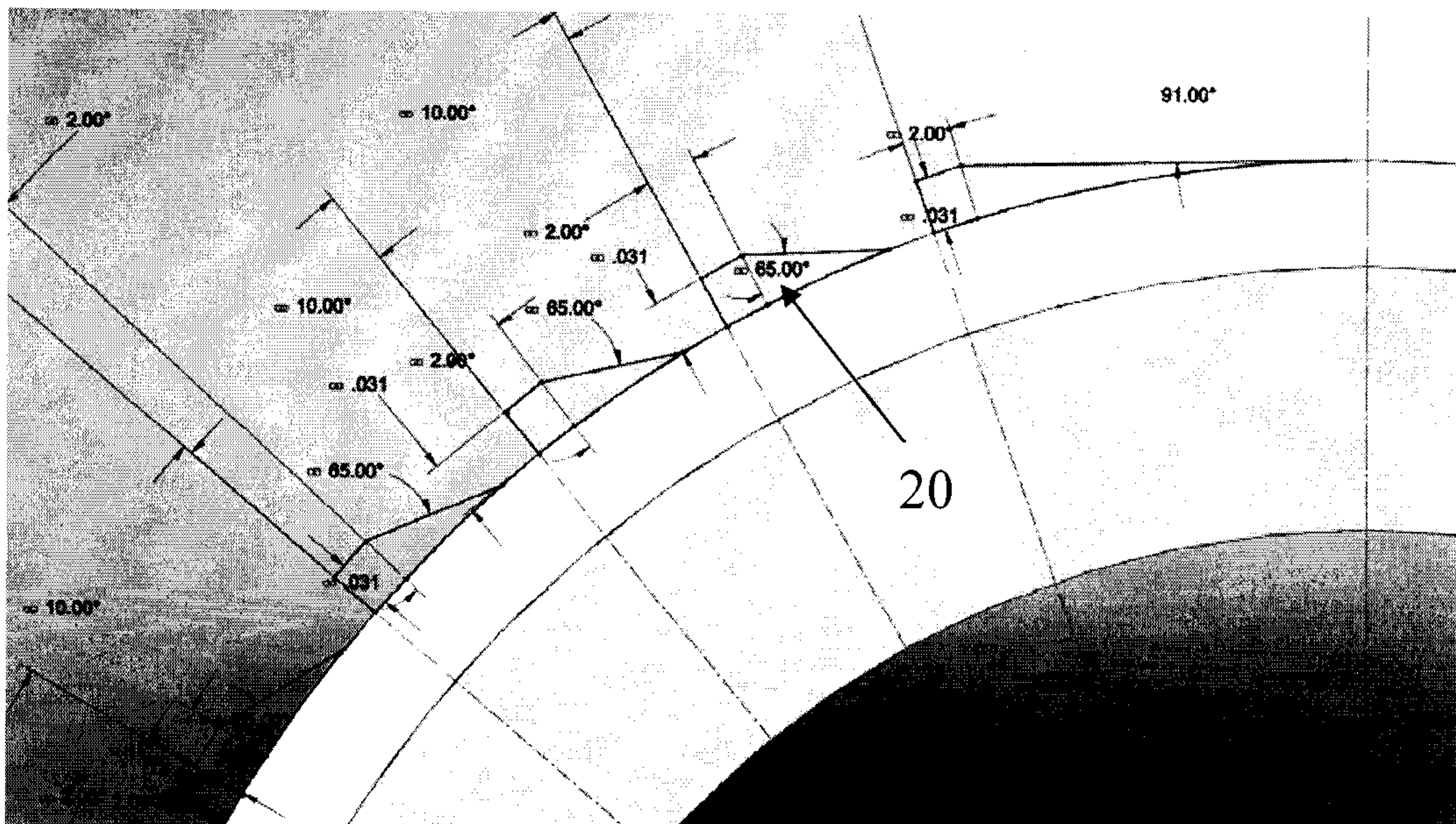


Fig. 8

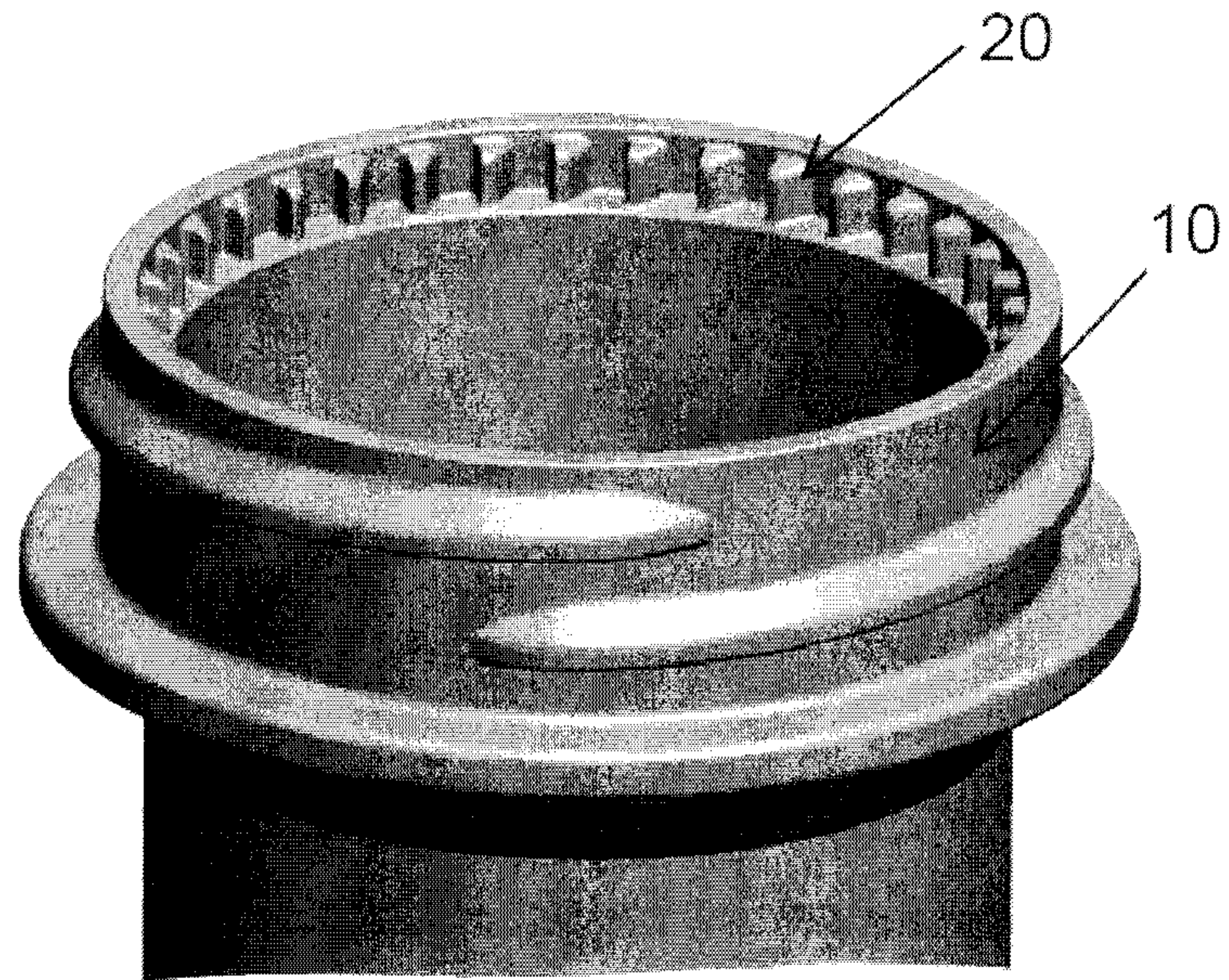


Fig. 9

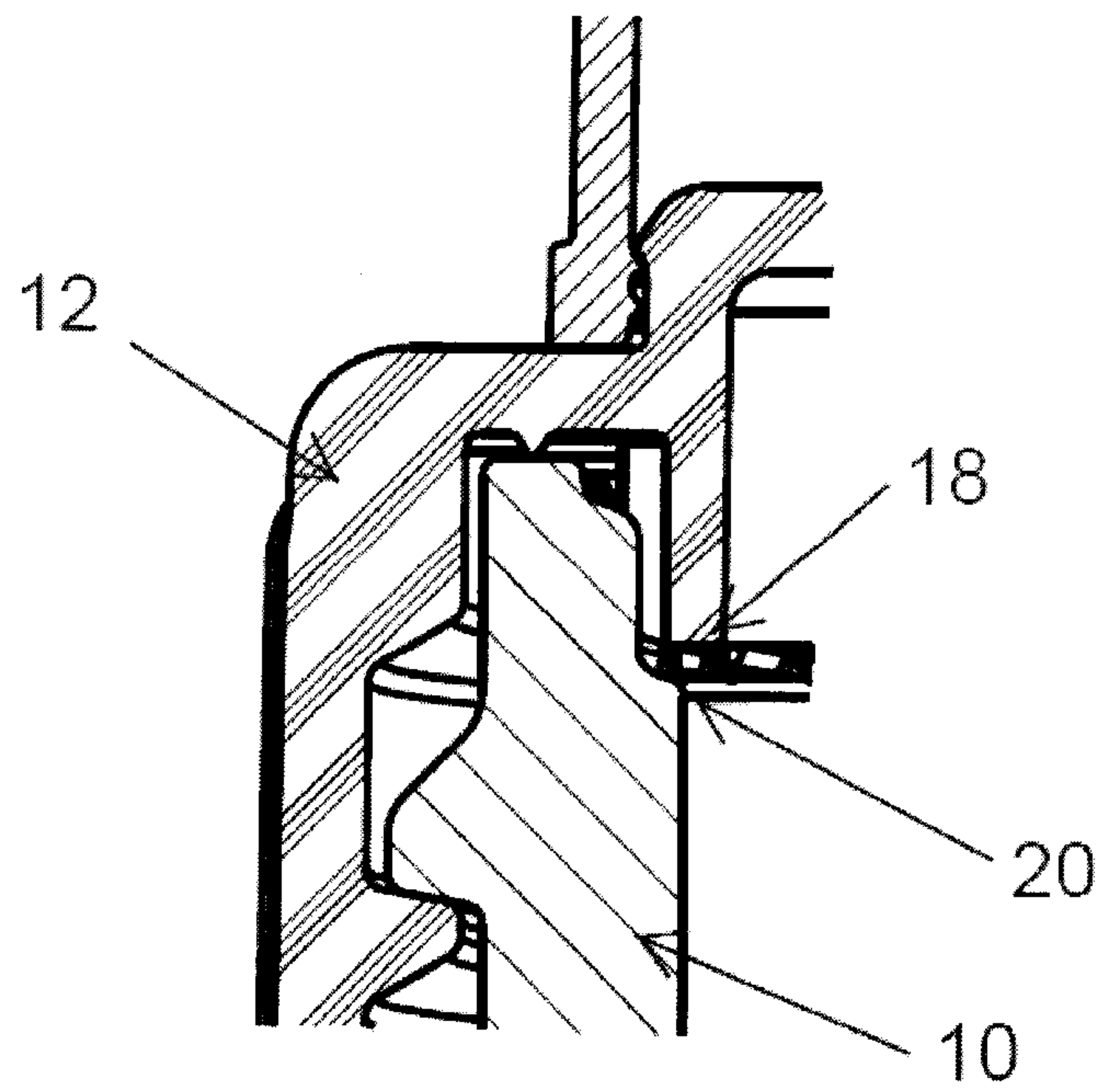


Fig. 10

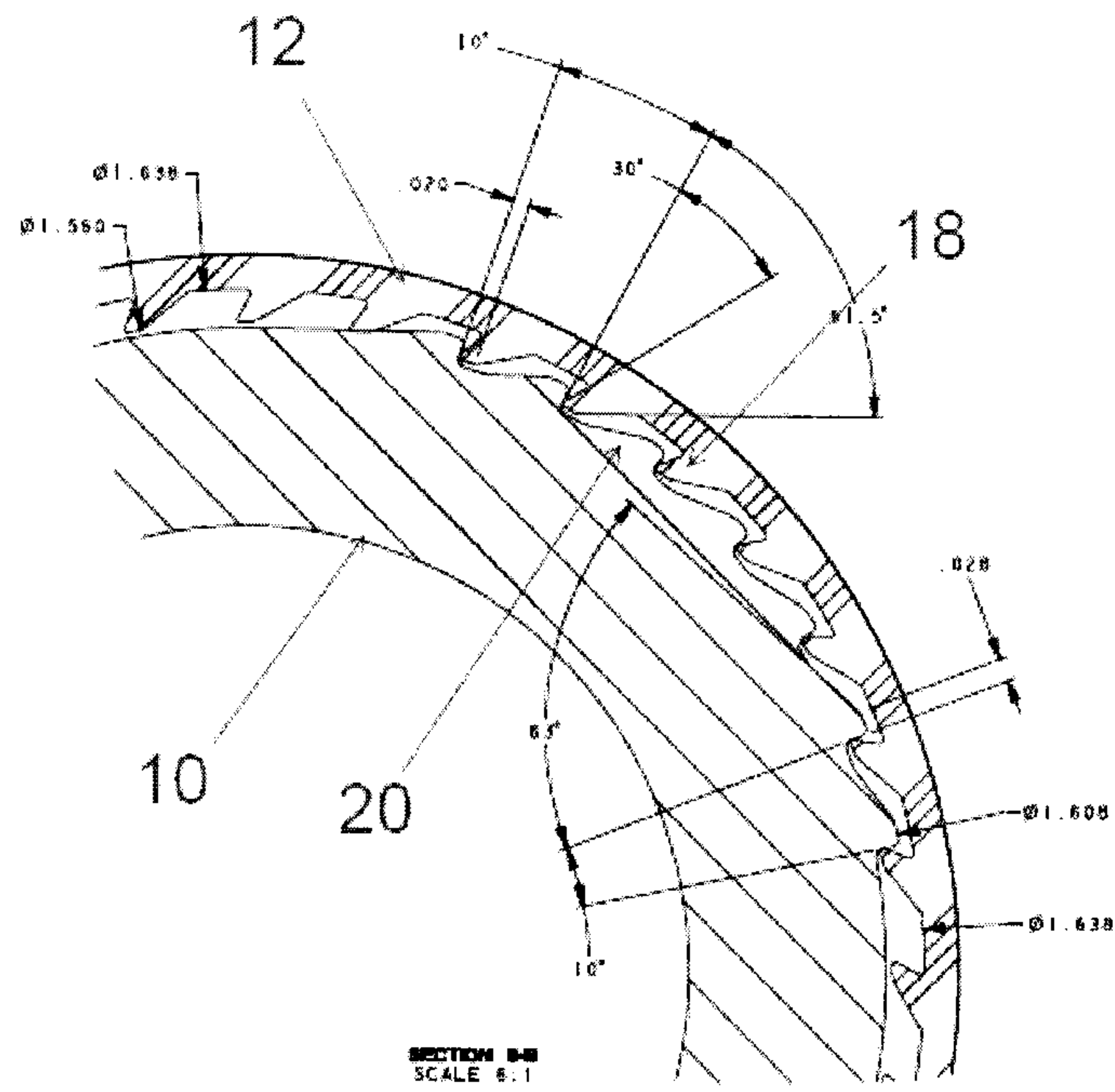


Fig. 11

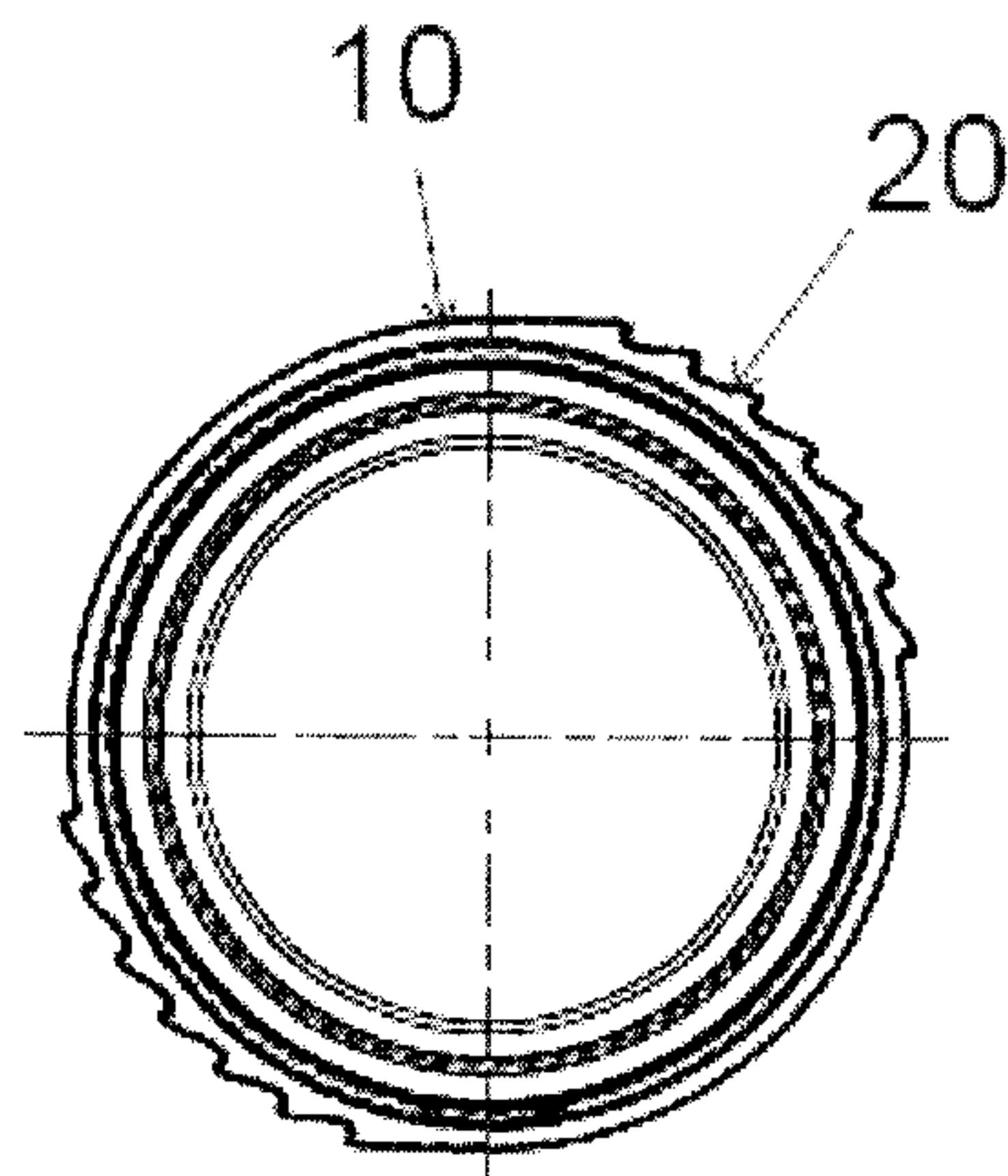


Fig. 12

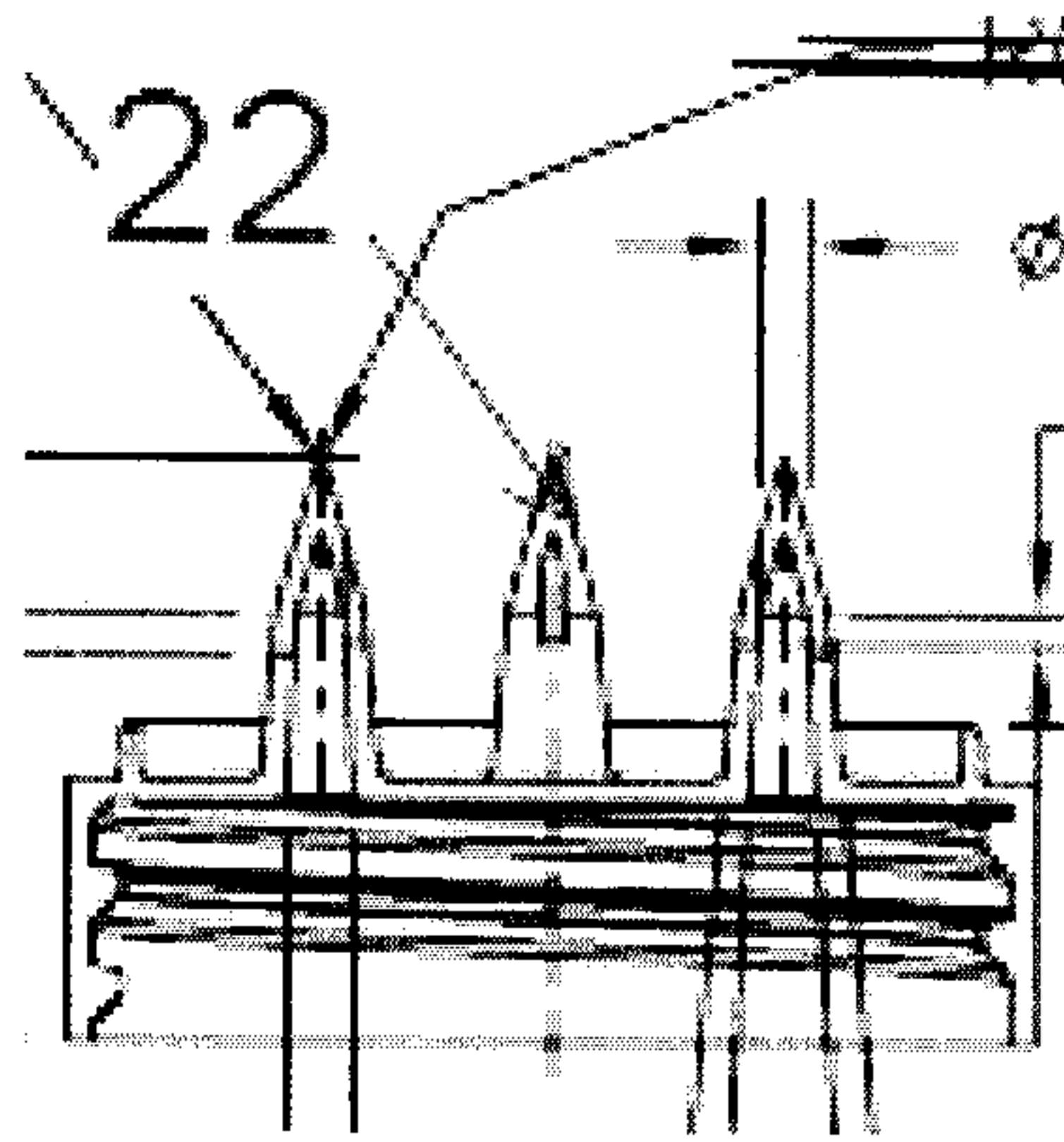


Fig. 13

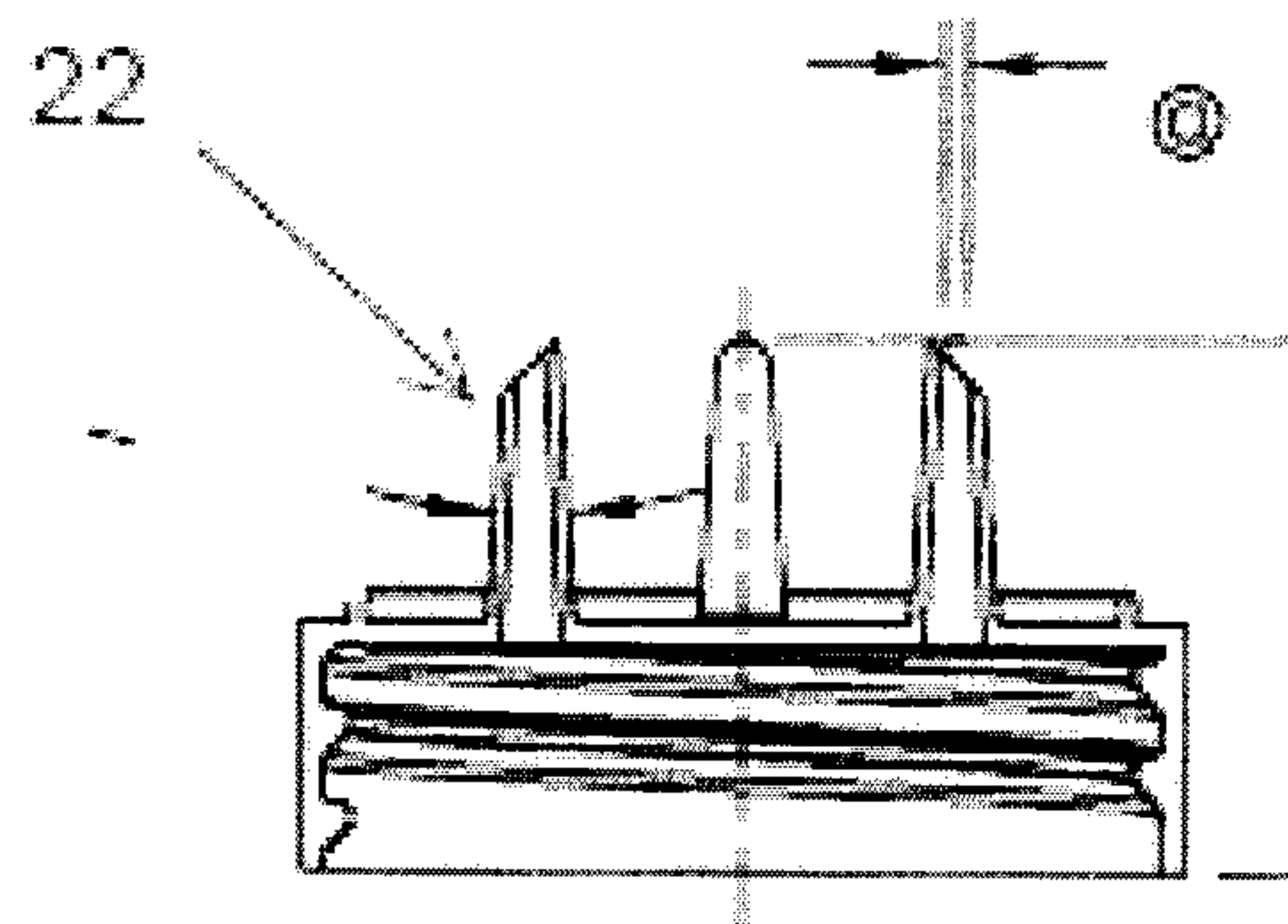


Fig. 14

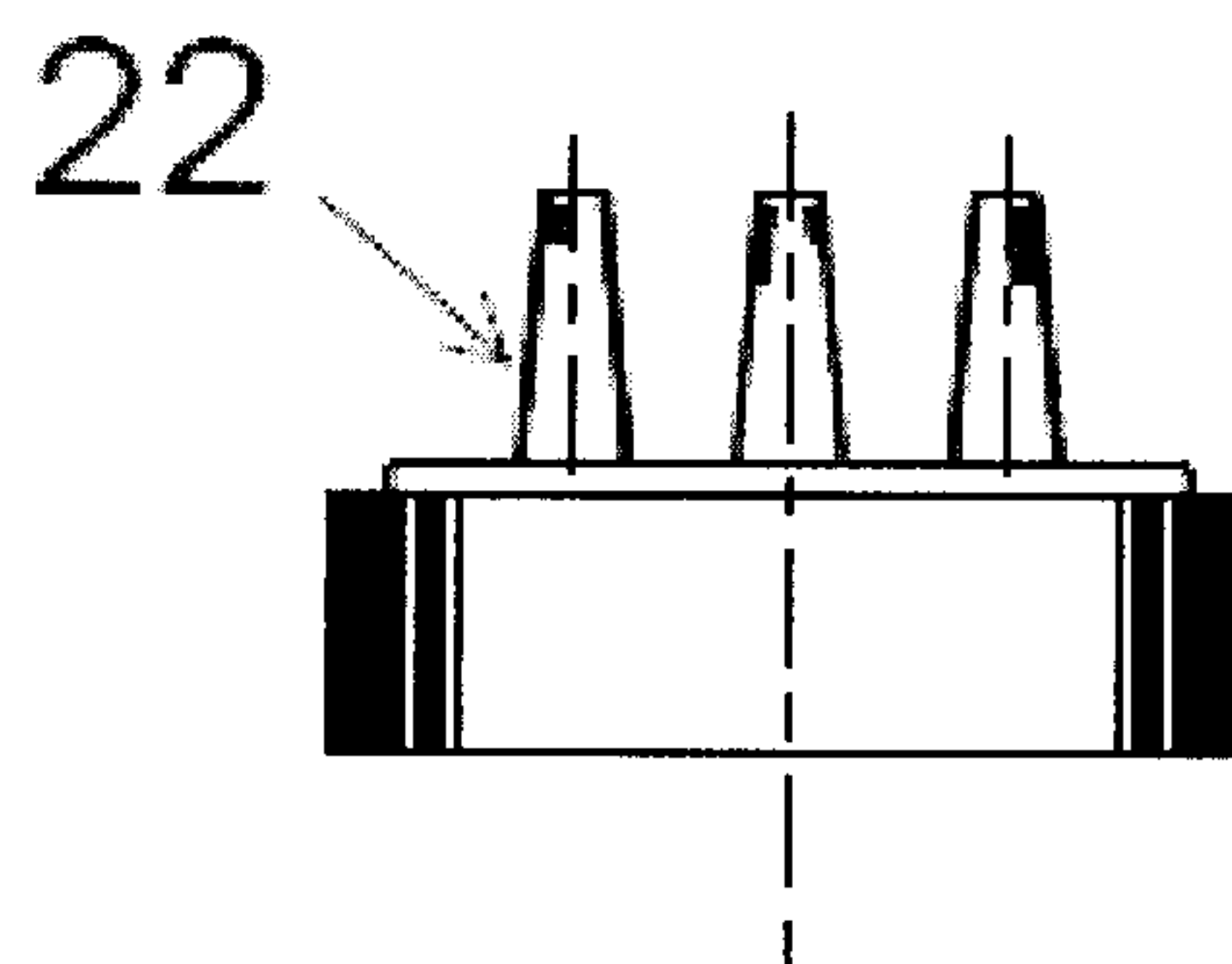


Fig. 15

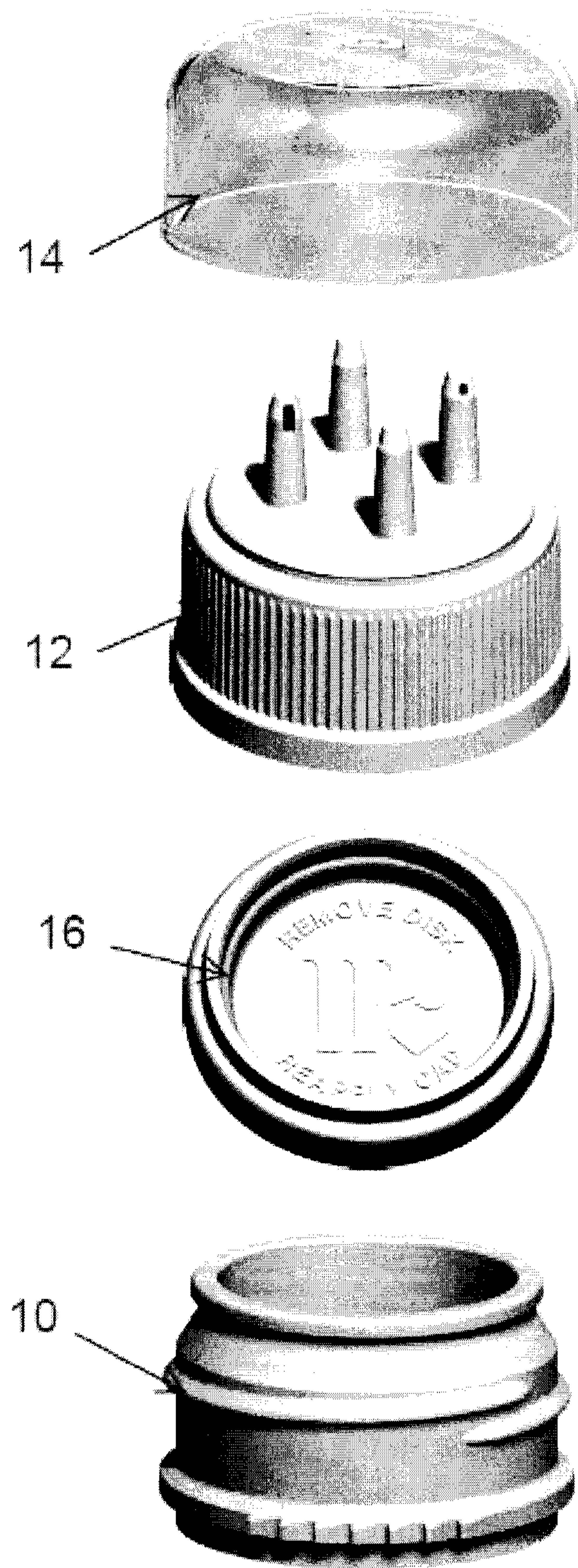


Fig. 16

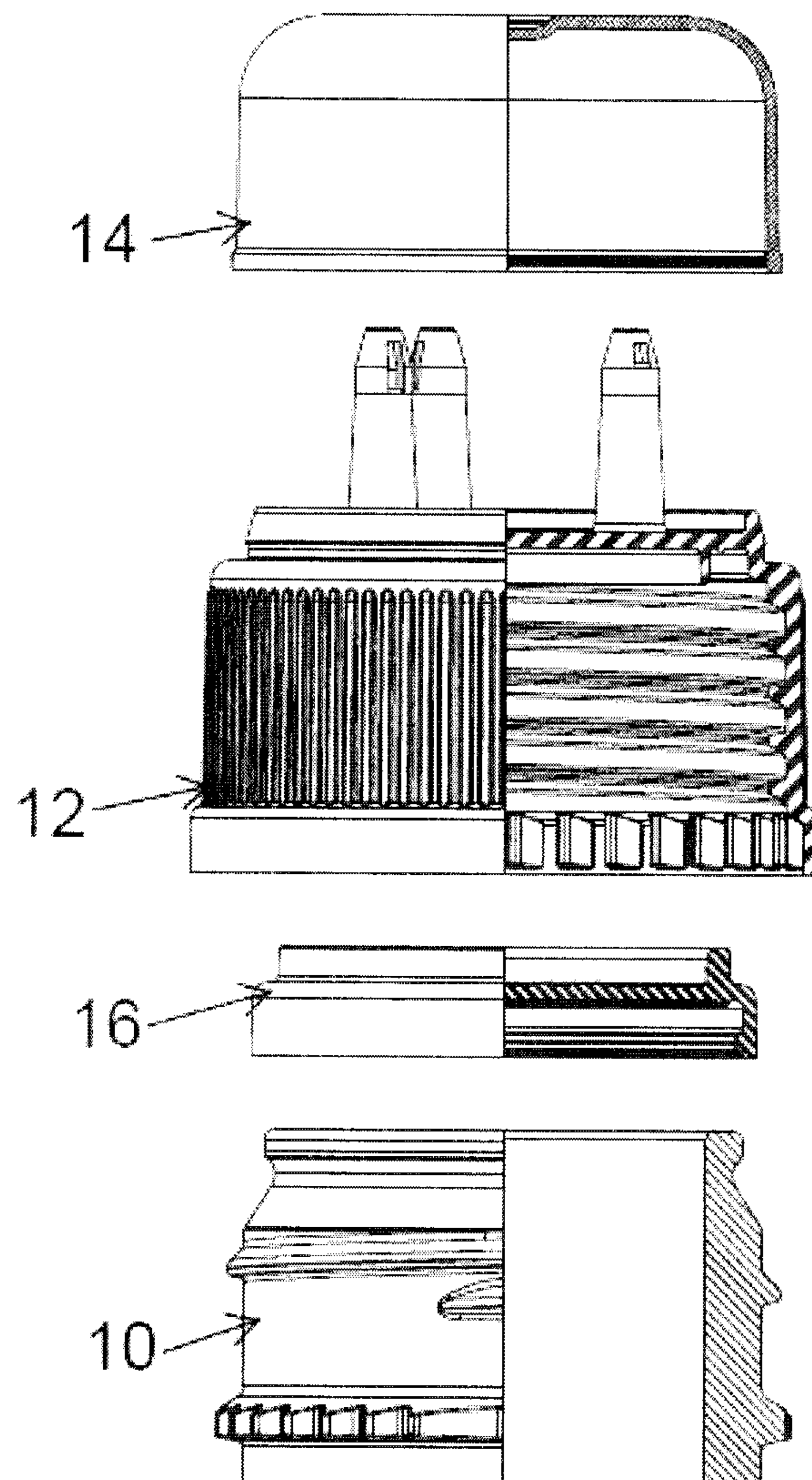
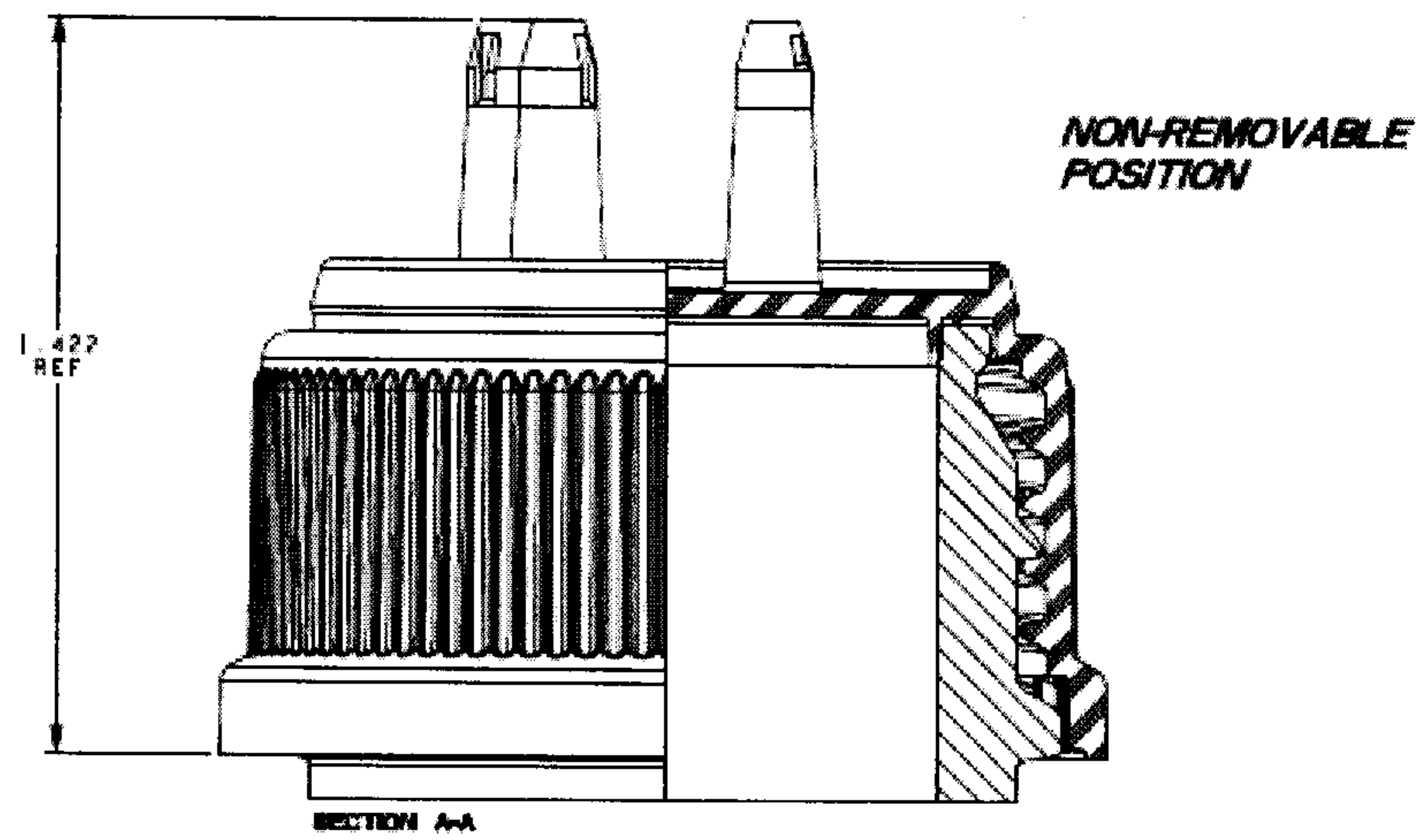
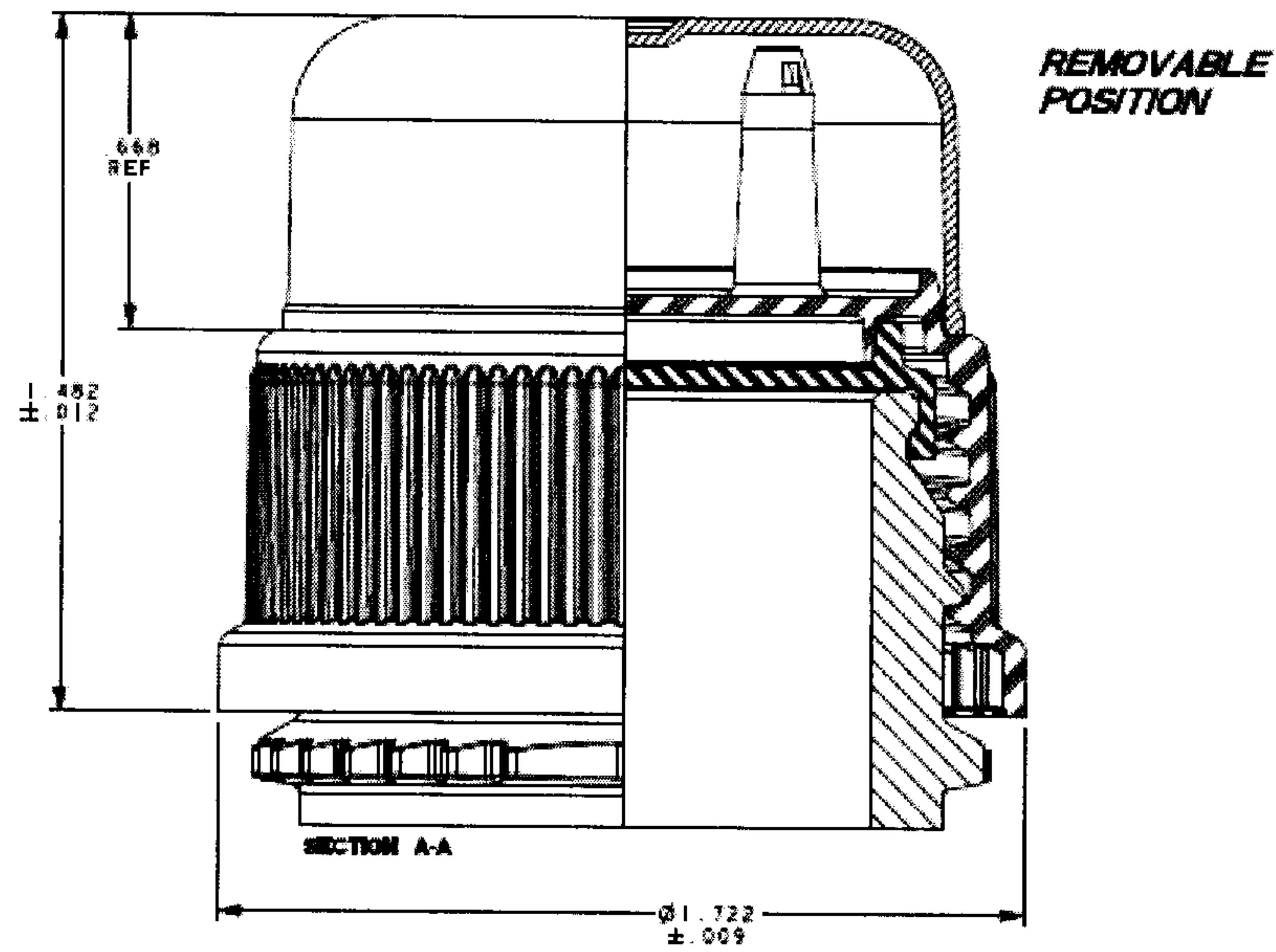


Fig. 17

Fig. 18**Fig. 19**

