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(54) Titre : CONTENANT COMPOSITE ET SON PROCEDE DE FABRICATION
(54) Title: COMPOSITE CONTAINER AND METHOD FOR MANUFACTURING SAME

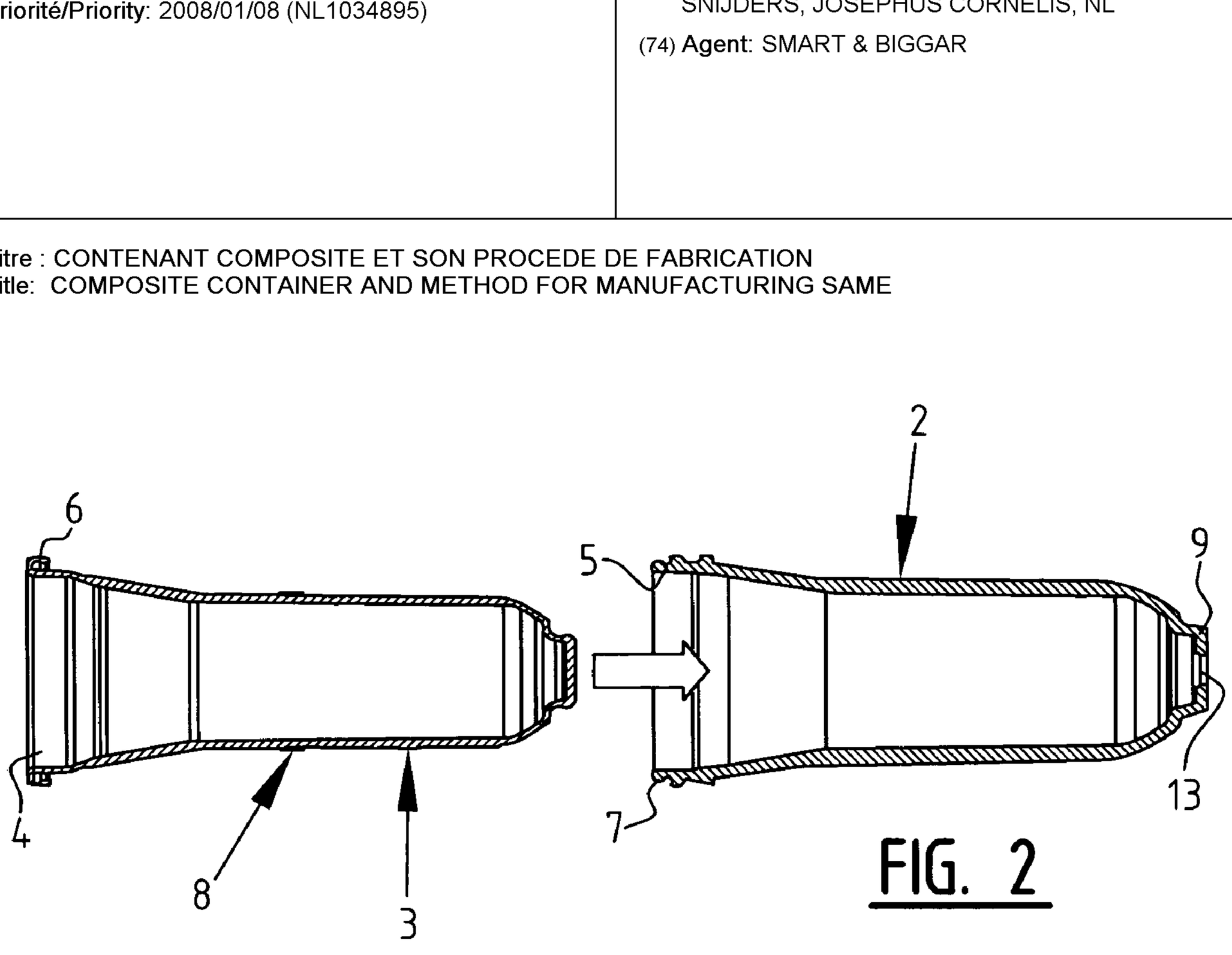

FIG. 2

(57) Abrégé/Abstract:
The invention relates to a composite container (1), comprising a form-retaining outer container (2) and a flexible inner container (3) received therein, which inner container comprises a dispensing opening (4) which is mounted in a neck (5) of the outer container, wherein the inner container is further connected by an adhesive or weld connection (8) over (a part of) its periphery to the outer container. The adhesive or weld connection can take the form of an adhesive strip or a weld extending transversely of, parallel to or at a non-right angle to a longitudinal axis (L) running from the dispensing opening to an opposite bottom (9) of the container. The adhesive or weld connection can be adapted to detach in controlled manner under the influence of pressures occurring in the container. The invention further relates to a method for manufacturing a composite container, wherein the inner container is connected over (a part of) its periphery thereto by means of adhesion or welding.

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(54) Title: COMPOSITE CONTAINER AND METHOD FOR MANUFACTURING SAME

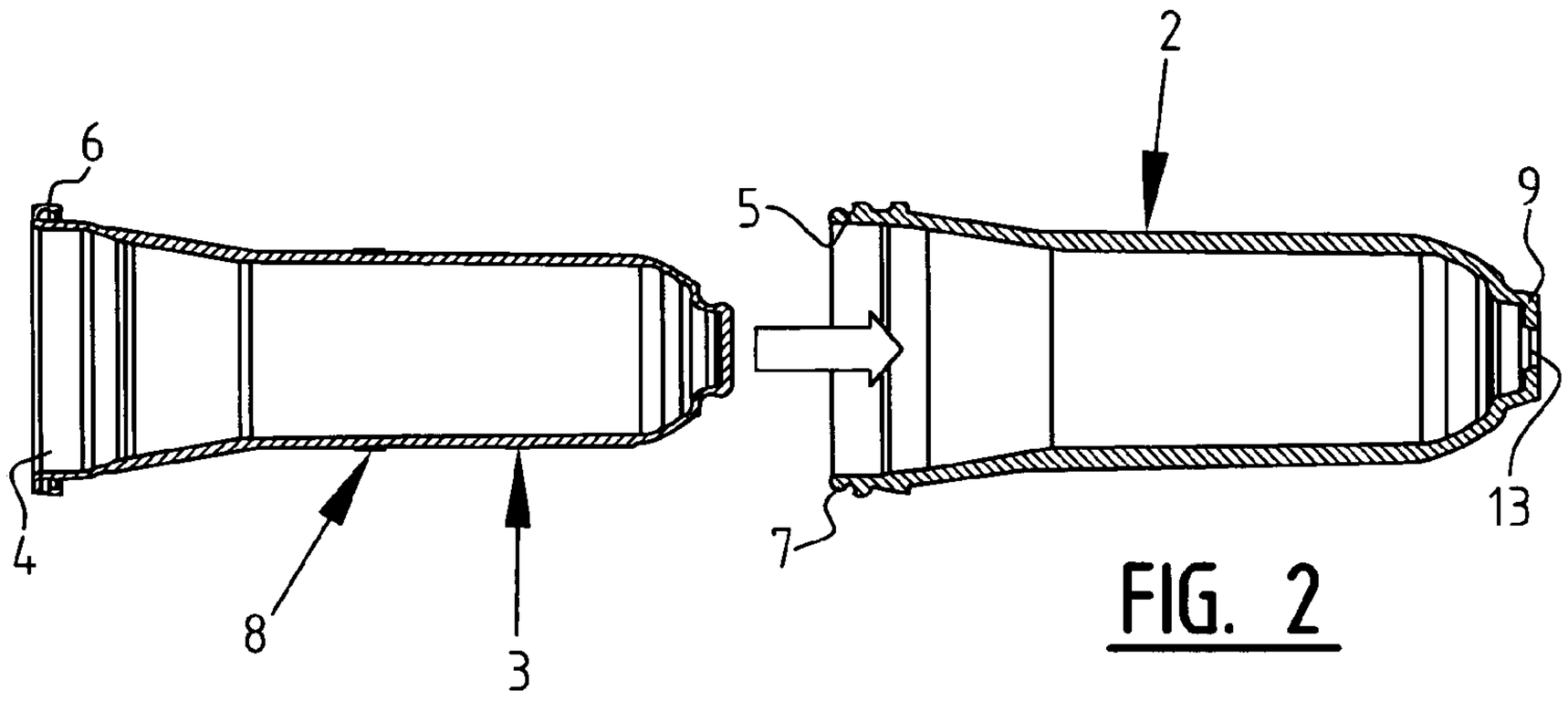

FIG. 2

(57) Abstract: The invention relates to a composite container (1), comprising a form-retaining outer container (2) and a flexible inner container (3) received therein, which inner container comprises a dispensing opening (4) which is mounted in a neck (5) of the outer container, wherein the inner container is further connected by an adhesive or weld connection (8) over (a part of) its periphery to the outer container. The adhesive or weld connection can take the form of an adhesive strip or a weld extending transversely of, parallel to or at a non-right angle to a longitudinal axis (L) running from the dispensing opening to an opposite bottom (9) of the container. The adhesive or weld connection can be adapted to detach in controlled manner under the influence of pressures occurring in the container. The invention further relates to a method for manufacturing a composite container, wherein the inner container is connected over (a part of) its periphery thereto by means of adhesion or welding.

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COMPOSITE CONTAINER AND METHOD FOR MANUFACTURING SAME

The invention relates to a composite container, comprising a form-retaining outer container and at least one flexible inner container received therein, which inner container comprises a dispensing opening which is mounted in a neck of the outer container, wherein the at least one inner container is further connected over at least a part of its periphery to the outer container. Such a composite container is described in the non-prepublished Netherlands patent application 1033582 of applicant.

In this earlier composite container the outer container and the inner container are formed integrally means of a two-component injection moulding process, followed by heating and blowing, so-called blow moulding. The inner container adheres here over its whole outer surface to the inner surface of the outer container. In this earlier composite container the connection between the inner container and the outer container is gradually broken when a displacing medium such as air is forced between the two containers. The flexible inner container is here gradually compressed further, whereby the content thereof, generally a liquid or a pasty mass, is pressed out of the composite container through the dispensing opening.

The invention now has for its object to further develop the above described composite container such that it is easier to manufacture and dispensing therefrom can be better controlled. According to the invention this is achieved in such a composite container in that the connection is an adhesive or weld connection. Such an adhesive or weld connection can be arranged in simple manner

and can be adapted to the desired release behaviour without the properties or materials of the outer container or the inner container having to be modified for this purpose.

Preferred embodiments of the composite container according to the invention are described in dependent claims 2-12.

The invention relates to a method for manufacturing a composite container as described above. For this purpose the invention provides a method comprising the steps of:

- forming a form-retaining outer container comprising a neck,
- forming at least one flexible inner container comprising a dispensing opening, and
- receiving the at least one inner container in the outer container and fixing said inner container to the neck thereof,

wherein, after being received in the outer container, the at least one inner container is connected over at least a part of its periphery thereto by means of adhesion or welding.

Preferably applied variants of this method form the subject-matter of dependent claims 14-25.

The invention is now elucidated on the basis of a number of examples, wherein reference is made to the accompanying drawing, in which:

Fig. 1 shows a side view of an inner container formed by injection moulding with an adhesive strip according to a first embodiment of the invention,

Fig. 2 shows a longitudinal section of how the inner container is received in an outer container likewise formed by injection moulding,

Fig. 3 is a cross-section in which the inner and outer containers are shown in assembled situation,

Fig. 4 shows a cross-section through the composite container of fig. 3 after it has been inflated to its final form, filled with a product for dispensing, closed with a dosing head and provided with a connecting member for a source of displacing medium,

Fig. 5-7 show cross-sections of the composite container of figure 4 during different stages of dispensing of the product from the container,

Fig. 8 is a view corresponding with fig. 1 of an inner container with an adhesive strip according to a second embodiment of the invention,

Fig. 9 is a view corresponding with fig. 4 of the composite container with the adhesive pattern of fig. 8,

Fig. 10-12 show cross-sections of the composite container of fig. 9 during various stages of dispensing of the product from the container,

Fig. 13 is a view corresponding with fig. 3 of yet another embodiment of the composite container with two inner containers received in each other,

Fig. 14 shows a cross-section through the composite container of fig. 13 after it has been inflated to its final form and filled with two products for dispensing,

Fig. 15 is a view corresponding with fig. 14 of the composite container during dispensing of the products from the two inner containers,

Fig. 16 is a view corresponding with fig. 1 and fig. 8 of an inner container with an adhesive strip according to yet another embodiment of the invention,

Fig. 17 is a view corresponding with fig. 3 and fig. 13 of a composite container on the basis of the inner container of fig. 13, and

Fig. 18-20 show cross-sections of the composite container of fig. 17 during various stages of dispensing of the product from the container.

A composite container 1 (fig. 4) according to the invention comprises a form-retaining outer container 2 and a flexible inner container 3 which is received therein and which can be filled with a product P for dispensing, for instance a liquid or a pasty mass. Inner container 3 has a dispensing opening 4 which is mounted in a neck 5 of outer container 2. In the shown example dispensing opening 4 has a bent collar 6 which is snapped round an edge 7 on neck 5. Inner container 3, which lies over substantially its whole surface against the inner wall of outer container 2, is further connected according to the invention to outer container 2 by an adhesive connection 8 over at least a part of its periphery, and in the shown example over its whole periphery.

In the shown example adhesive connection 8 takes the form of a strip. This strip extends transversely of a longitudinal axis L which runs from dispensing opening 4 to a bottom 9 of container 1 lying opposite. Adhesive strip 8 is here arranged halfway between dispensing opening 4 and bottom 9 and can withstand the pressures which will occur in composite container 1 during dispensing of product P therefrom.

Dispensing opening 4 of inner container 3, which also functions as dispensing opening of the whole composite container 1, is closed by a dosing head 10 mounted thereon and having a dosing opening 11 which can be closed by a pivotable closure member 12. Formed in the bottom of outer container 2 is an opening 13 through which a displacing medium D such as air can be forced between inner container 3 and outer container 2 (fig. 5). Provided for this purpose is

a connecting member 14, an opening 15 of which can be connected to a source (not shown) of displacing medium D, for instance an air pump.

In the shown example outer container 2 and inner container 3 are both formed separately by injection moulding, the outer container 2 from polyethylene terephthalate (PET) and inner container 3 from polypropylene (PP). They leave the injection mould as a relatively thick-walled semi-manufacture (referred to as preform) which has roughly the form of a test tube. Adhesive strip 8 is arranged around the preform of inner container 3 (fig. 1), after which this preform is inserted into the preform of outer container 2 (fig. 2) and fixed therein (fig. 3). The fixing is effected on the one hand by mechanical means by clicking collar 6 fixedly round edge 7, and on the other by chemical means by means of adhesive connection 8. The preforms are then heated to a temperature between the glass temperature and the melting temperature of the plastics used so that they become soft. The composite container can then be blown into its final shape in a mould.

When composite container 1 is used for dosed dispensing of product P, a displacing medium D is forced, as stated, into the space between outer container 2 and inner container 3 via connecting member 14 and opening 13. Pressure is hereby developed in inner container 3 so that product P will flow therefrom as soon as closure member 12 leaves clear the opening 11 in dosing head 10. The presence of adhesive strip 8 ensures here that, from roughly halfway along, the inner container 3 remains adhered over its whole periphery to outer container 2, so that displacing medium D cannot come into the vicinity of dispensing opening 4. Inner container 3 is thus emptied uniformly from bottom 9 and is prevented from being pressed closed from somewhere along the

sides, whereby product P could become "trapped". Because adhesive connection 8 can withstand the pressures occurring when a container 3 is being pressed, the inner container will as it were fold up around adhesive connection 8, as shown particularly when figures 6 and 7 are compared.

In an alternative embodiment of the invention adhesive strip 8 does not lie transversely of longitudinal axis L but runs at a non-right angle (fig. 8). Adhesive strip 8 in fact runs spirally here. In this embodiment adhesive connection 8 is adapted to detach in controlled manner under the influence of pressures occurring in container 1. When product P is dispensed from this embodiment of composite container 1 by admitting displacing medium D under pressure, inner container 3 does not therefore fold over when reaching adhesive connection 8 as in the first embodiment. Instead, inner container 3 is gradually pulled away from the side wall of outer container 2 as a result of adhesive connection 8 detaching (fig. 9-12).

In yet another embodiment of composite container 1, which is suitable for simultaneously dispensing two products P1 and P2, a secondary inner container 16 is received in first inner container 3, which is connected to outer container 2 by means of adhesive connection 8 (fig. 13). This secondary inner container 16 likewise has a dispensing opening 17, which is mounted in random manner in dispensing opening 4 of the primary inner container 3. Also arranged between dispensing opening 4 of primary inner container 3 and dispensing opening 17 of secondary inner container 16 are a number of ribs 18, which are distributed in peripheral direction and which keep clear a number of passages between the two inner containers 3, 16. In this way the primary inner container 3 can be filled with the product

P1 to be dispensed therefrom (fig. 14) and this product P1 can in turn also be dispensed therefrom.

During use of this composite container 1 a displacing medium D is once again urged into the space between outer container 2 and primary inner container 3, whereby primary inner container 3 is brought under pressure. The secondary inner container 16 received therein is simultaneously also placed under pressure as a result. Product P1 in primary inner container 3 here in fact functions as displacing medium for secondary inner container 16. When the dosing head (not shown) is then opened, products P1 and P2 are dispensed simultaneously from composite container 1 (fig. 15).

In the final embodiment shown here the adhesive strip 8 is also arranged spirally round inner container 3, around the part of inner container 3 situated closest to dispensing opening 4 (fig. 16). At the position where adhesive strip 8 is arranged, inner container 3 has in its outer surface a recess R in which the adhesive can be received. The recess can for instance be formed by locally reducing the wall thickness or by displacing the whole wall slightly inward.

When inner container 3 is pressed into outer container 2, adhesive strip 8 is spread and distributed over the whole recess R - as shown schematically by the wider strip in fig. 17. Despite the fact that the recessed wall part of inner container 3 itself does not lie against the inner wall of outer container 2, a good connection is nevertheless formed between inner container 3 and outer container 2. This is important for a good heat transfer during blow moulding of inner and outer containers 2, 3. During this blow moulding the already spread adhesive layer is distributed even further under the influence of the high

pressure (in the order of 30 bar or more), so that a very uniform connection is formed over a considerable part of the contact surface between inner container 3 and outer container 2.

Adhesive connection 8 in this embodiment is not intended to detach in controlled manner. Adhesive connection 8 must instead withstand pressures which occur when displacing medium D is pressed into composite container 1. Displacing medium D is thus prevented from being able to penetrate between inner container 3 and outer container 2 in the vicinity of dispensing opening 4. Inner container 3 then as it were folds over, and its non-adhered part eventually comes to lie along its adhered part (fig. 20).

The invention thus makes it possible to form a composite container in relatively simple manner, using which a product can be dispensed uniformly by means of a displacing medium, without the product coming into contact with the displacing medium. The composite container according to the invention is thus highly suitable for application with food products.

Although the invention has been elucidated above on the basis of a number of embodiments, it will be apparent that the invention is not limited thereto. The inner container and/or the outer container could thus be manufactured from materials other than discussed here, and could in particular comprise multiple layers. The form and dimensions of the inner and outer containers could also be varied, wherein it would also be possible to receive a plurality of inner containers in a single outer container adjacently of, instead of in, each other. The adhesive connection between the (primary) inner container(s) and outer container could further be differently formed. It is for instance possible to envisage arranging a number of

adhesive strips distributed over the periphery which run parallel to the longitudinal axis. Such strips could either form a permanent connection, around which the inner container folds, or could detach gradually. Finally, it is possible to envisage a weld connection being formed between the inner container and the outer container instead of an adhesive connection.

The scope of the invention is therefore defined solely by the following claims.

International application no. PCT/NL2009/000001
Enclosure to letter dated 23 December 2009

New Claims

1. Composite container, comprising a form-retaining outer container and at least one flexible inner container received therein, which inner container comprises a dispensing opening which is mounted in a neck of the outer container, wherein the at least one inner container is further connected over at least a part of its periphery to the outer container, wherein the connection is an adhesive connection,

characterized in that the inner container has an outer surface which lies substantially wholly against an inner surface of the outer container with forming of a contact surface, the adhesive connection extends over a considerable part of the contact surface, and the outer surface of the inner container and/or the inner surface of the outer container has a recess locally.

2. Composite container as claimed in claim 1, **characterized in that** the adhesive connection extends substantially over the whole periphery of the inner container.

3. Composite container as claimed in claim 1 or 2, **characterized in that** the adhesive connection can withstand pressures occurring in the container.

4. Composite container as claimed in claim 1, **characterized in that** the adhesive connection is adapted to detach in controlled manner under the influence of pressures occurring in the container.

5. Composite container as claimed in any of the foregoing claims, **characterized in that** a secondary inner container is received in the inner container connected by the adhesive connection to the outer container.

6. Composite container as claimed in any of the foregoing claims, **characterized in that** the inner container and the outer container are each preformed as injection-moulded part and, after the adhesive connection has been realized, are brought into their final form by blow moulding.

7. Method for manufacturing a composite container, comprising of:

- forming a form-retaining outer container comprising a neck,
- forming at least one flexible inner container comprising a dispensing opening, and
- receiving the at least one inner container in the outer container and fixing said inner container to the neck thereof,

wherein, after being received in the outer container, the at least one inner container is connected over at least a part of its periphery thereto by means of adhesion,

characterized in that the inner container is received in the outer container such that an outer surface thereof lies substantially wholly against an inner surface of the outer container with forming of a contact surface, the inner container is connected to the outer container over a considerable part of the contact surface by means of adhesion, and the outer container is formed with an inner surface which has a recess locally and/or the inner container is formed with an outer surface which has a recess locally.

8. Method as claimed in claim 7, **characterized in that** at least one adhesive strip is distributed over the recess during placing of the inner container into the outer container.

9. Method as claimed in claim 7 or 8, **characterized in that** the adhesive connection is formed substantially over the whole periphery of the at least one inner container and outer container.

10. Method as claimed in claim 8 or 9, **characterized in that** the at least one adhesive strip is arranged on the at least one inner container before this latter is received in the outer container.

11. Method as claimed in any of the claims 7-10, **characterized in that** a secondary inner container is received in the inner container connected by the adhesive connection to the outer container.

12. Method as claimed in any of the claims 7-11, **characterized in that** the outer container and the at least one inner container are formed by injection moulding.

13. Method as claimed in claim 12, **characterized in that** after being adhered to each other, the outer container and the at least one inner container are brought into their final form by blow moulding.

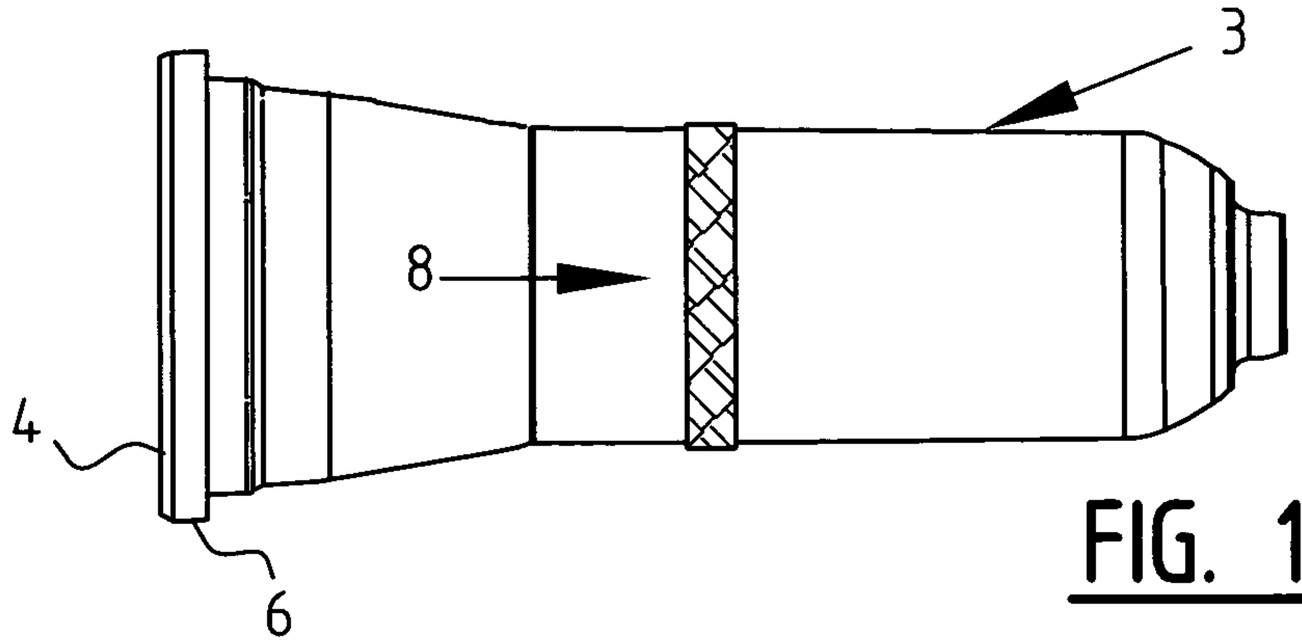

FIG. 1

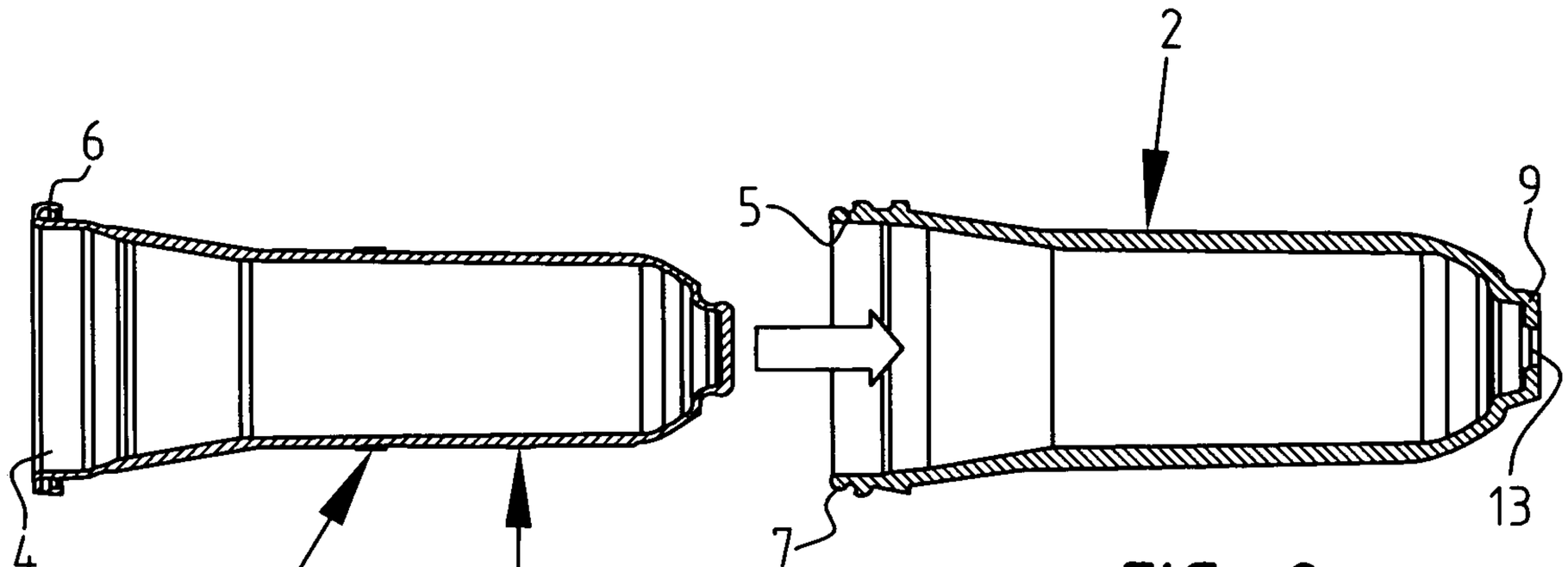

FIG. 2

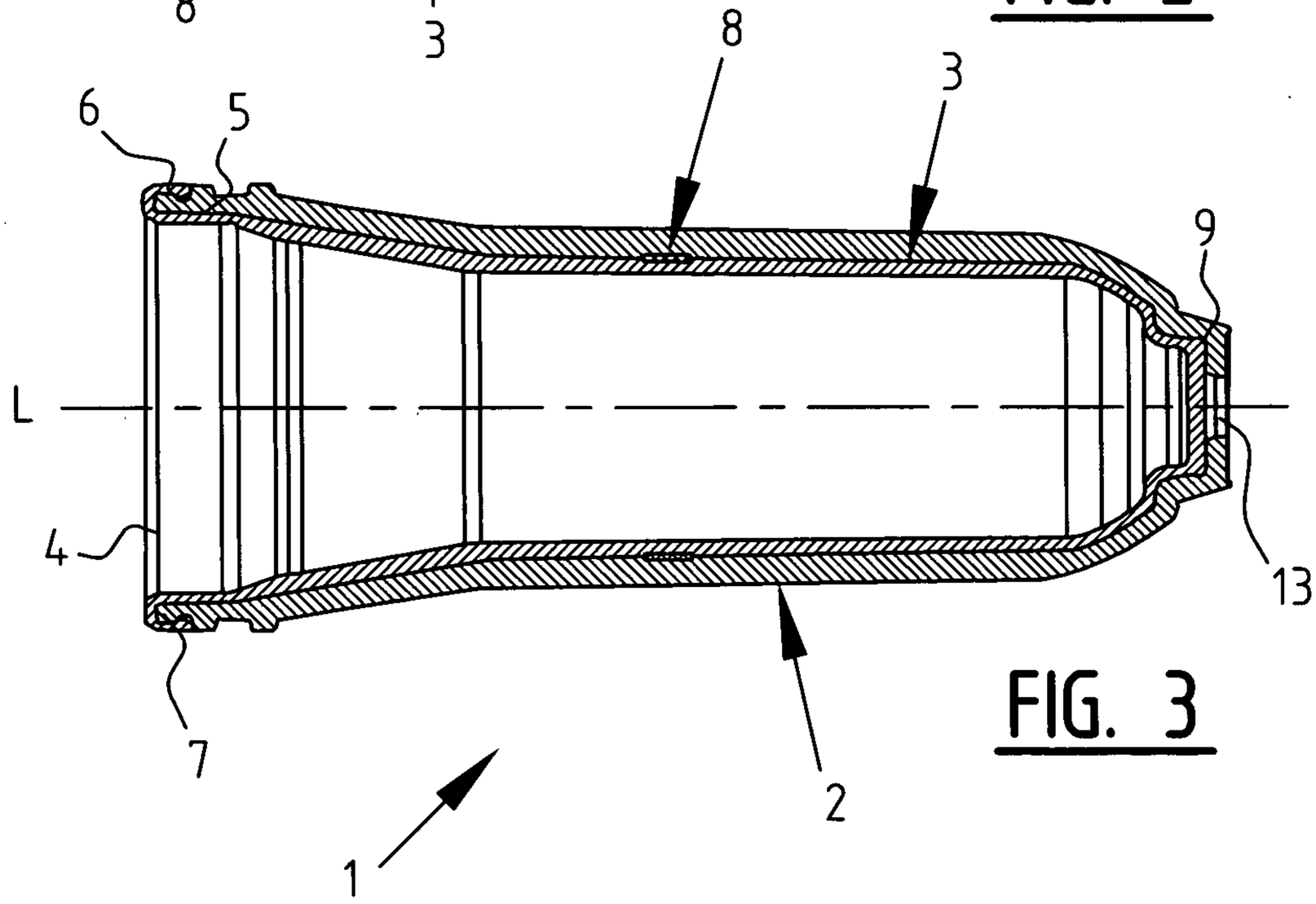

FIG. 3

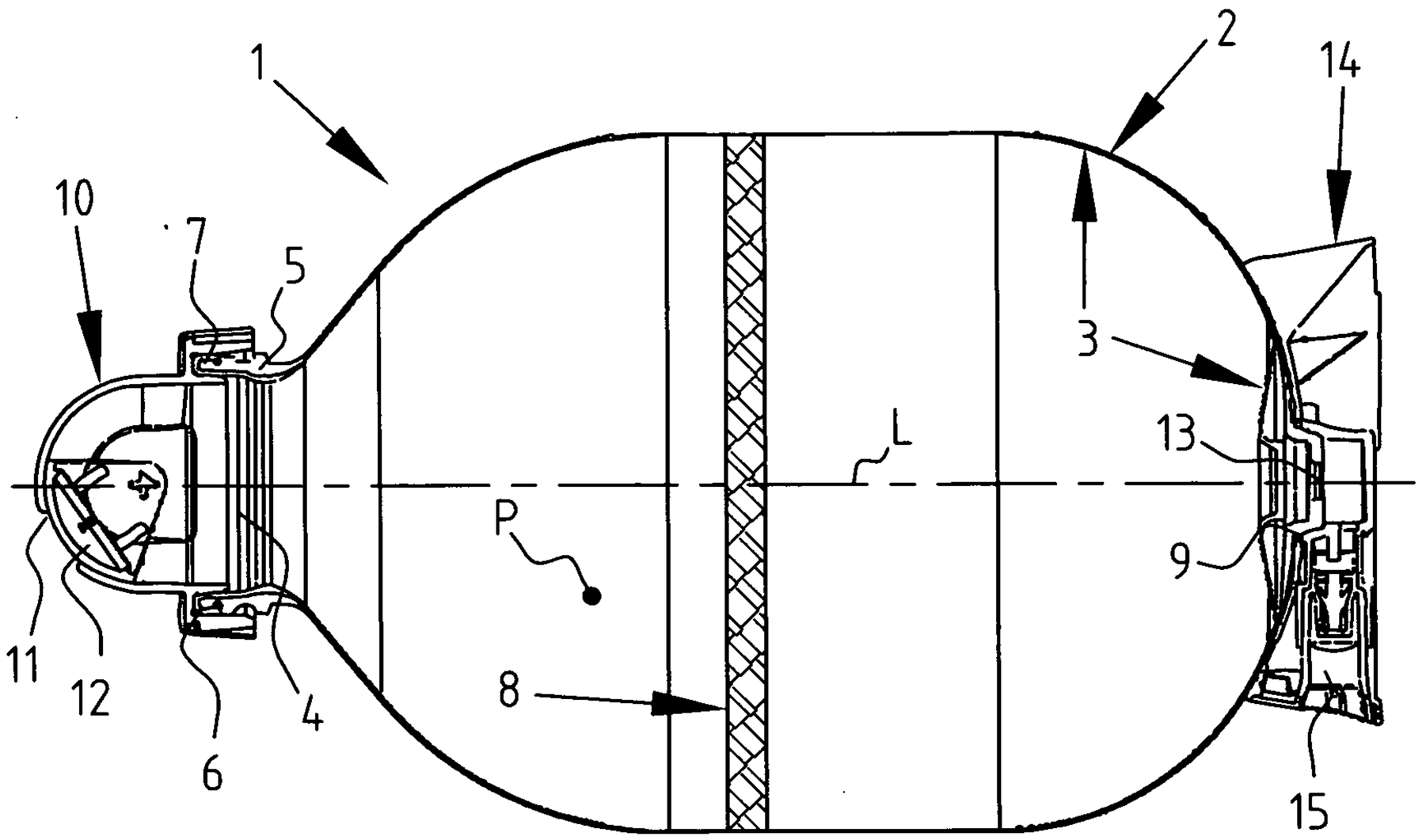

FIG. 4

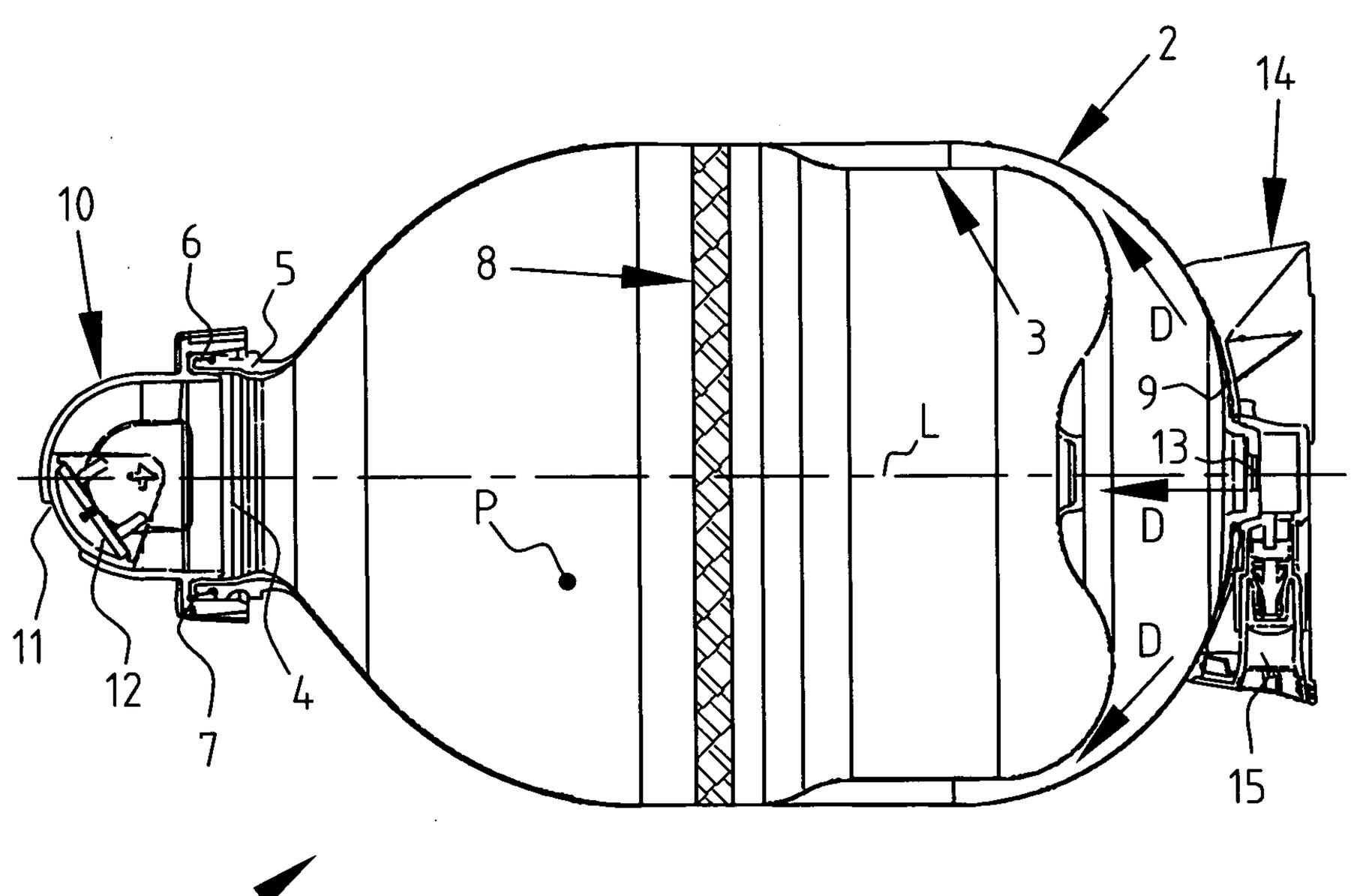

FIG. 5

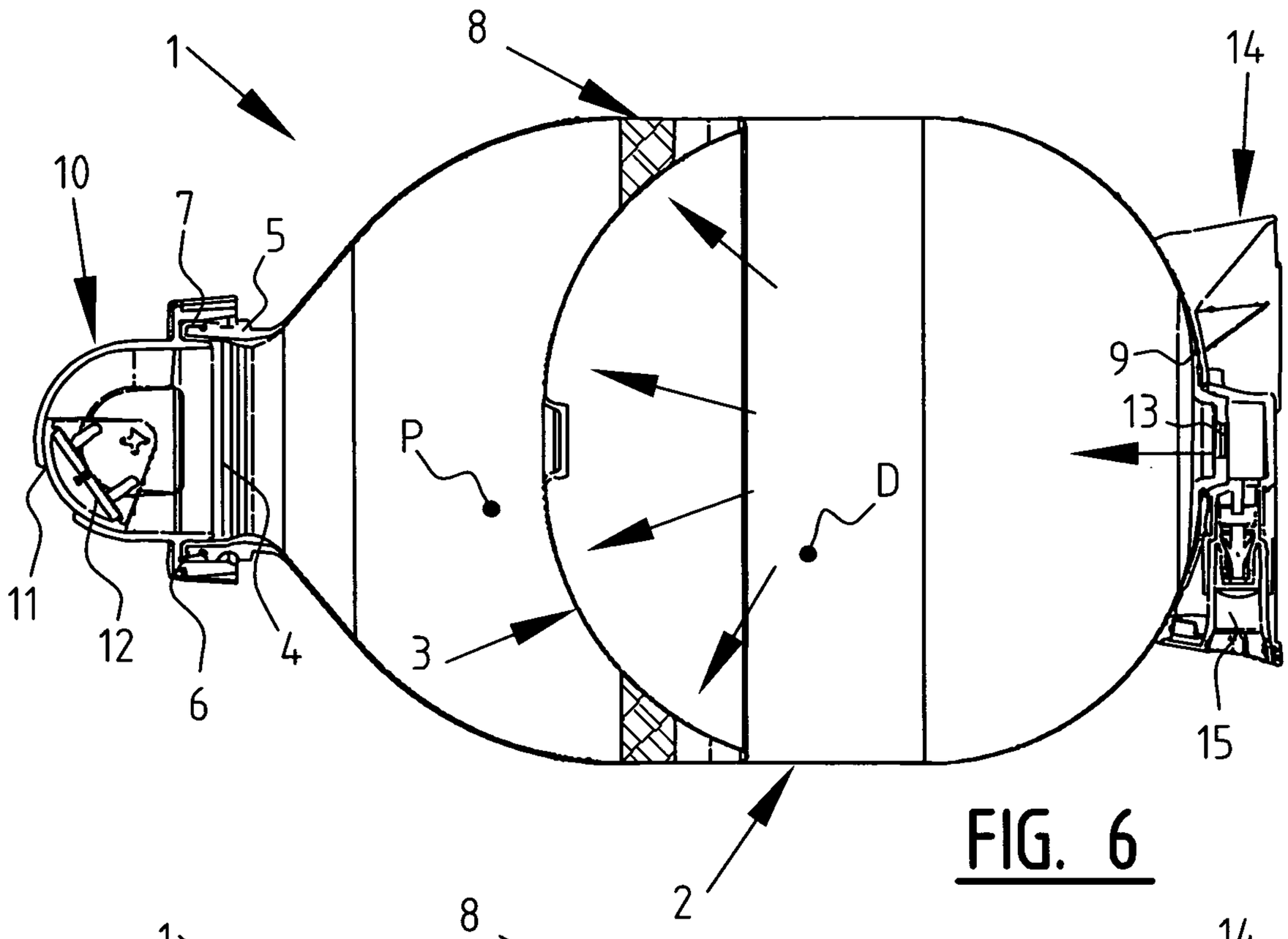

FIG. 6

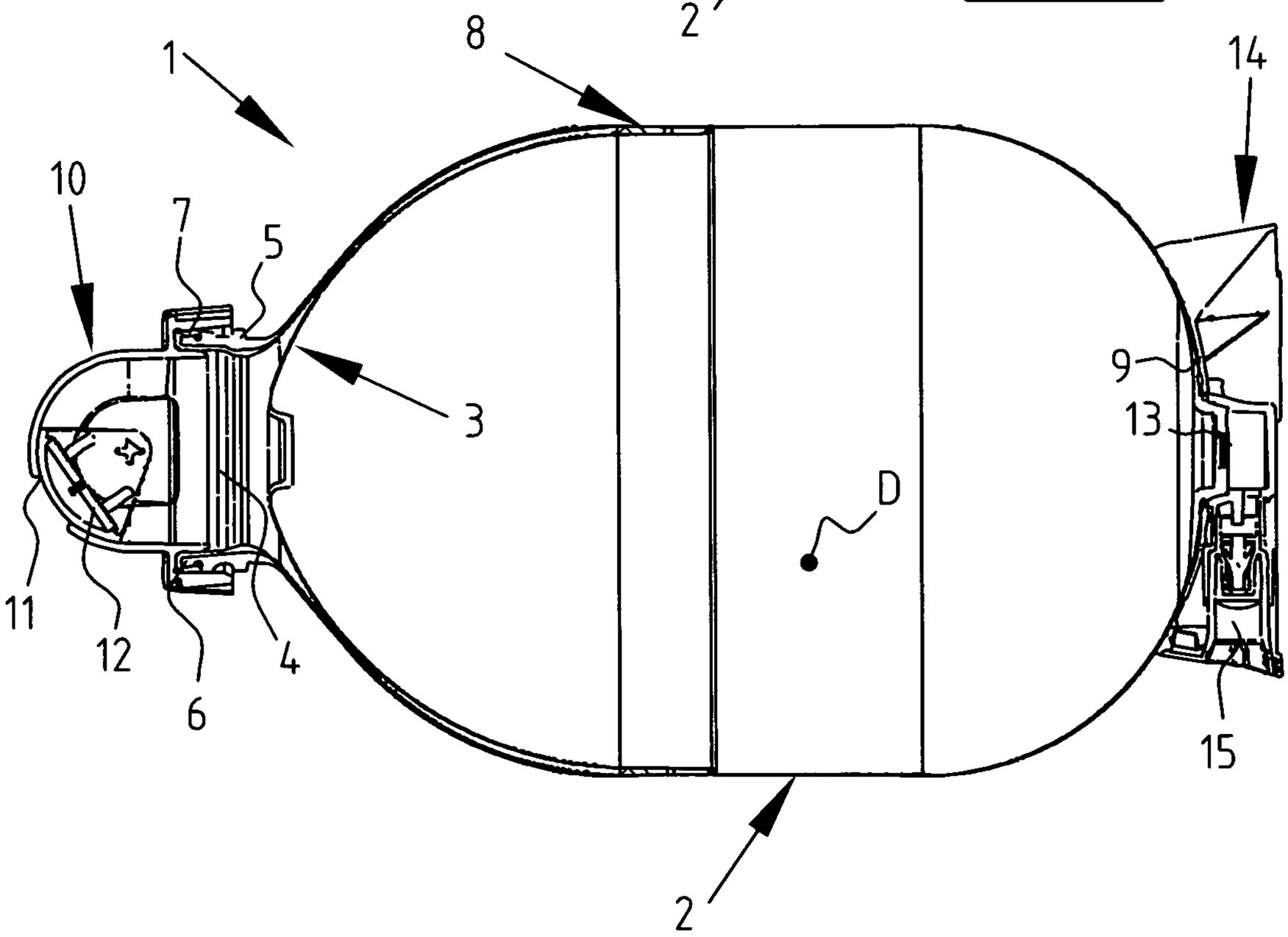

FIG. 7

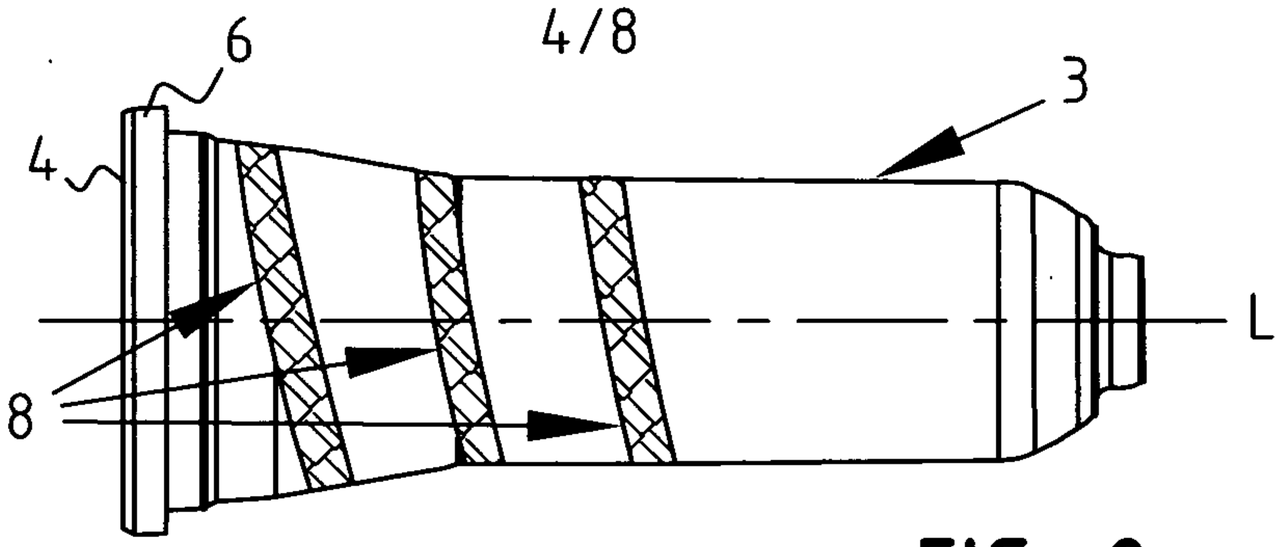

FIG. 8

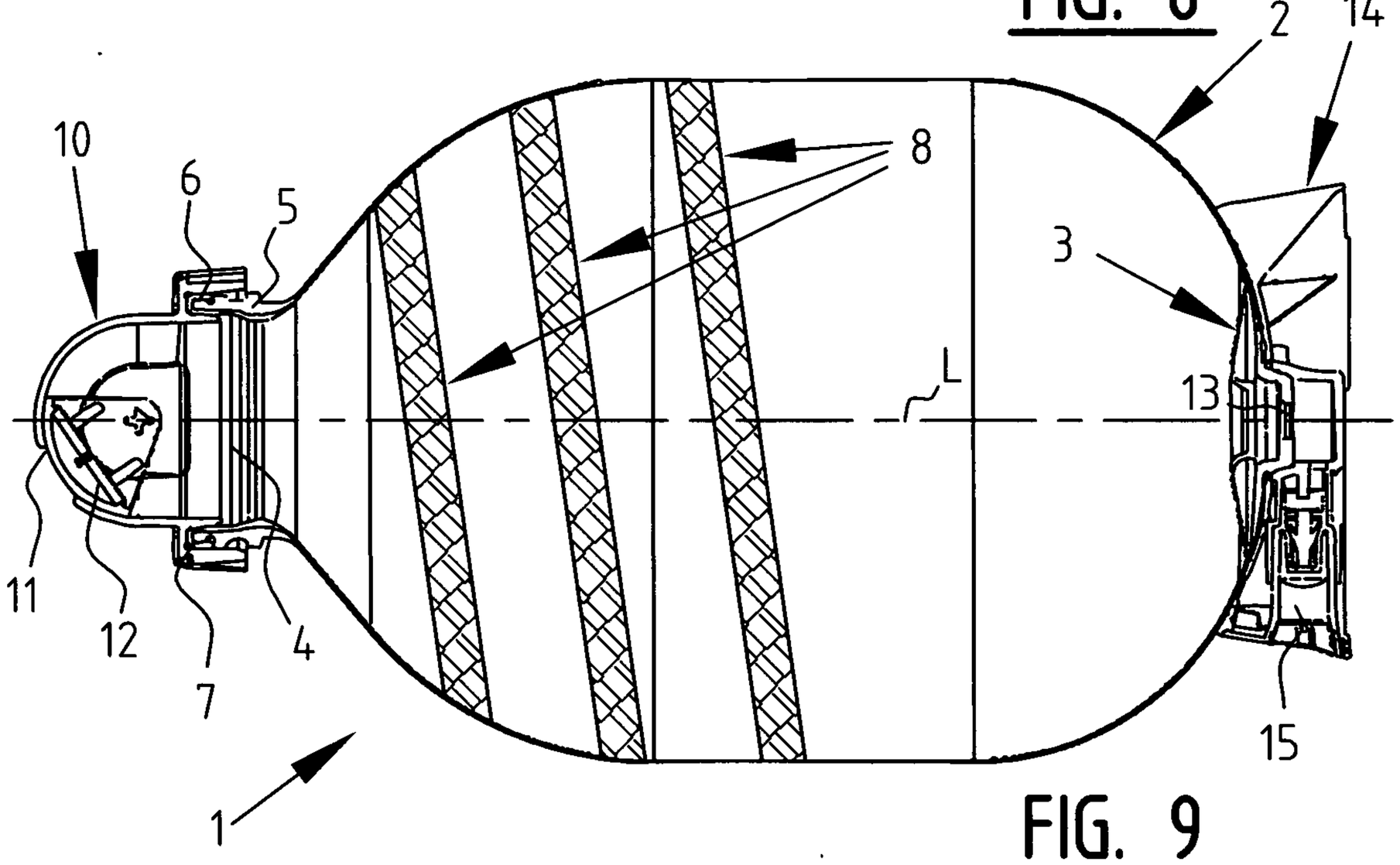

FIG. 9

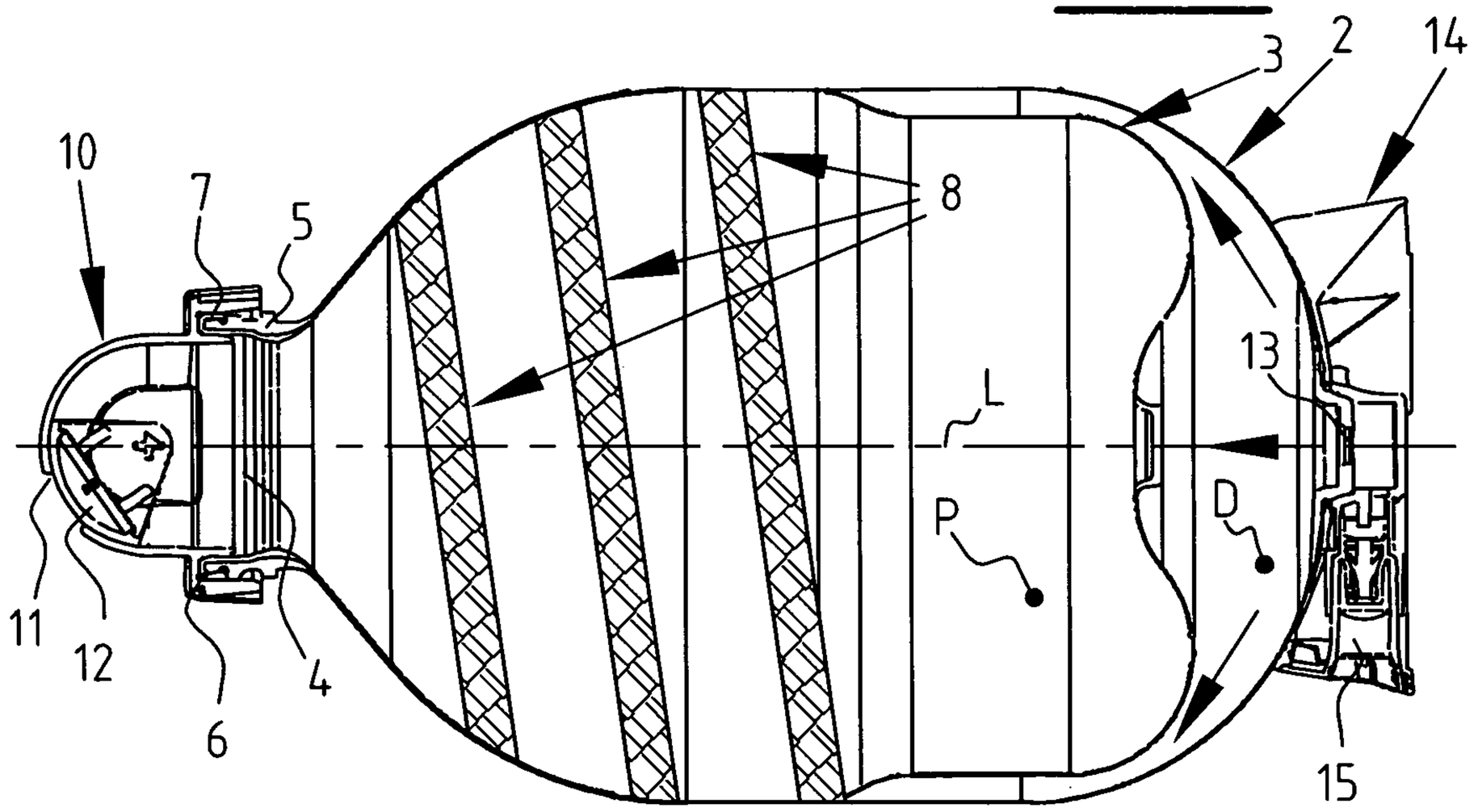

FIG. 10

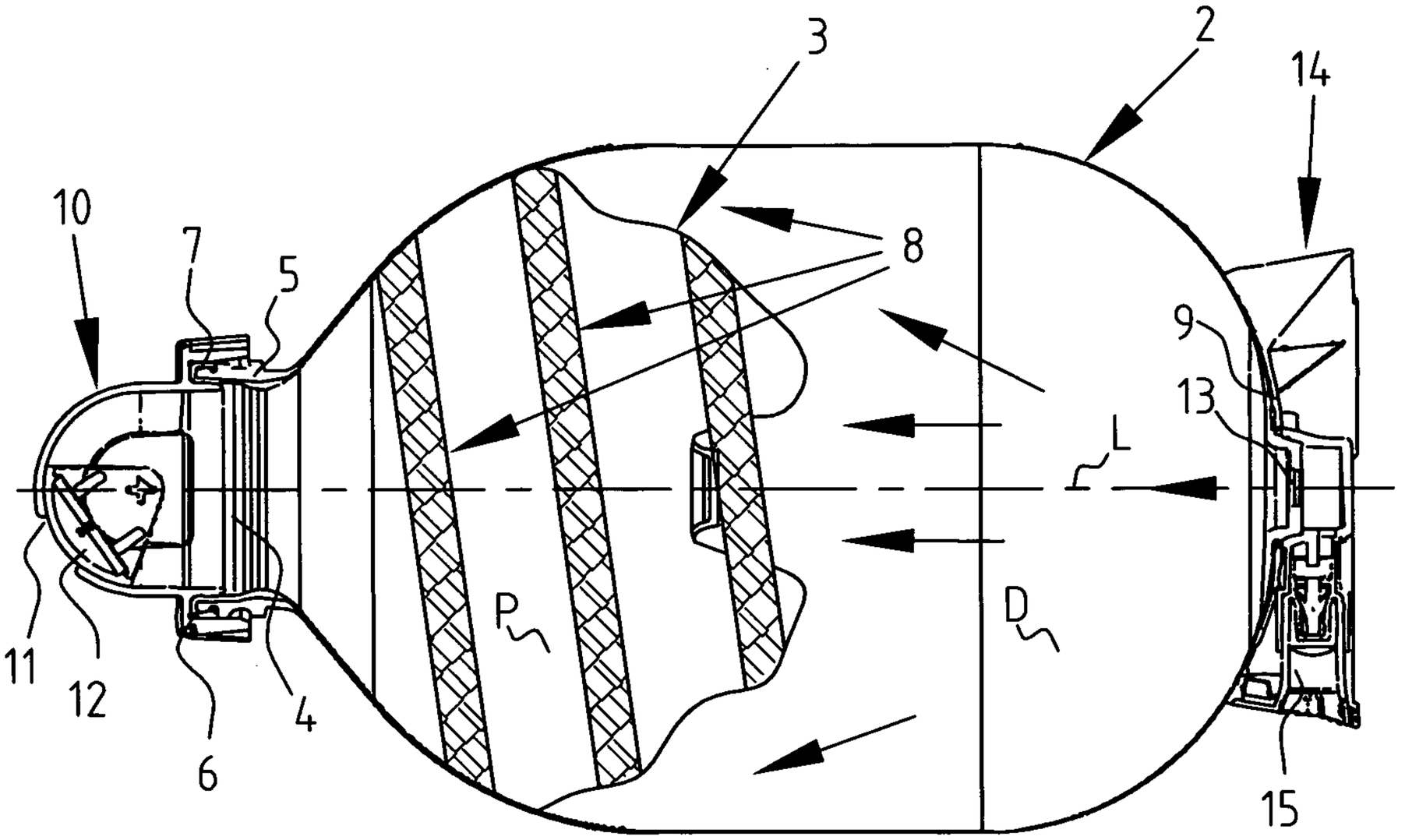

FIG. 11

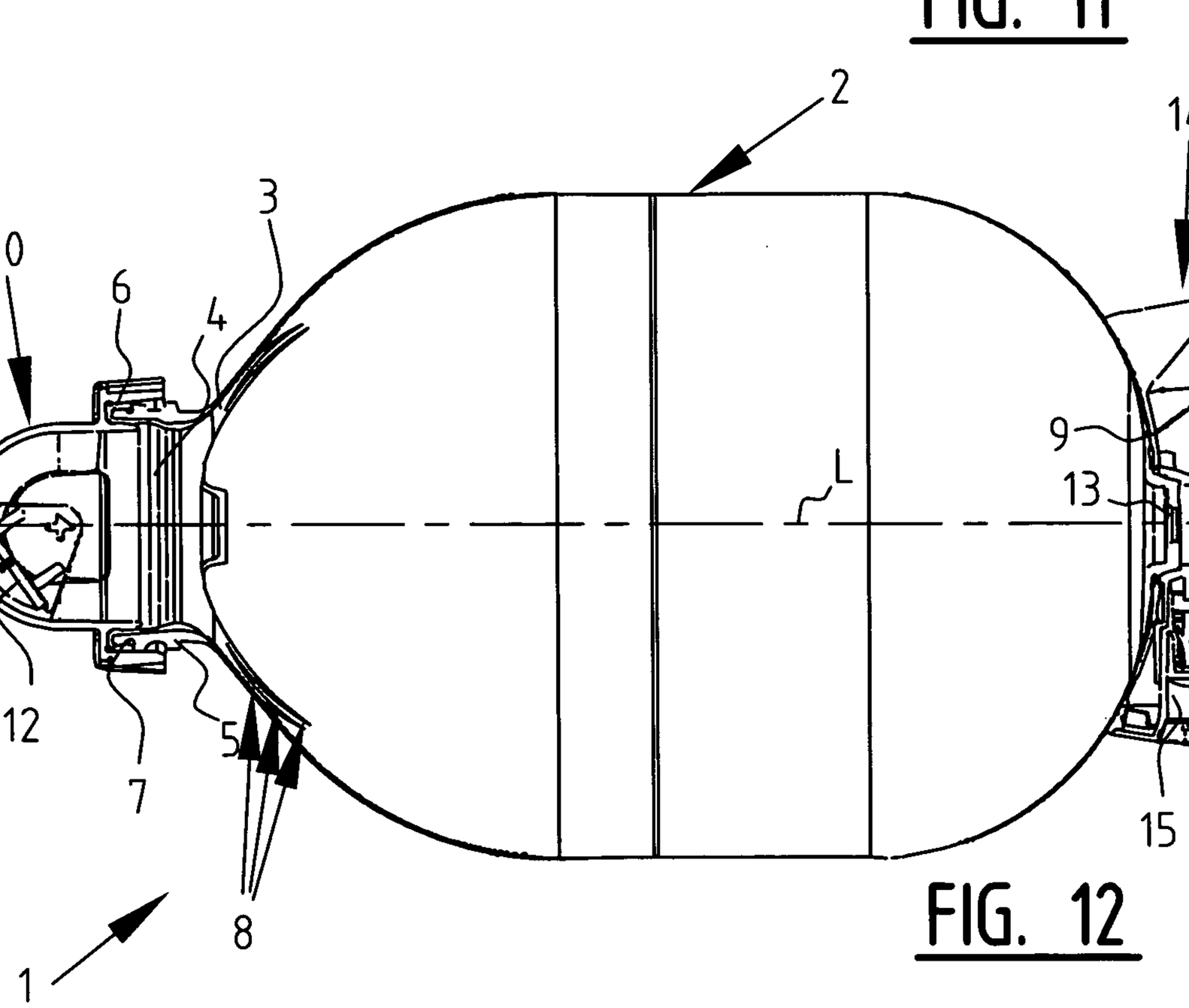

FIG. 12

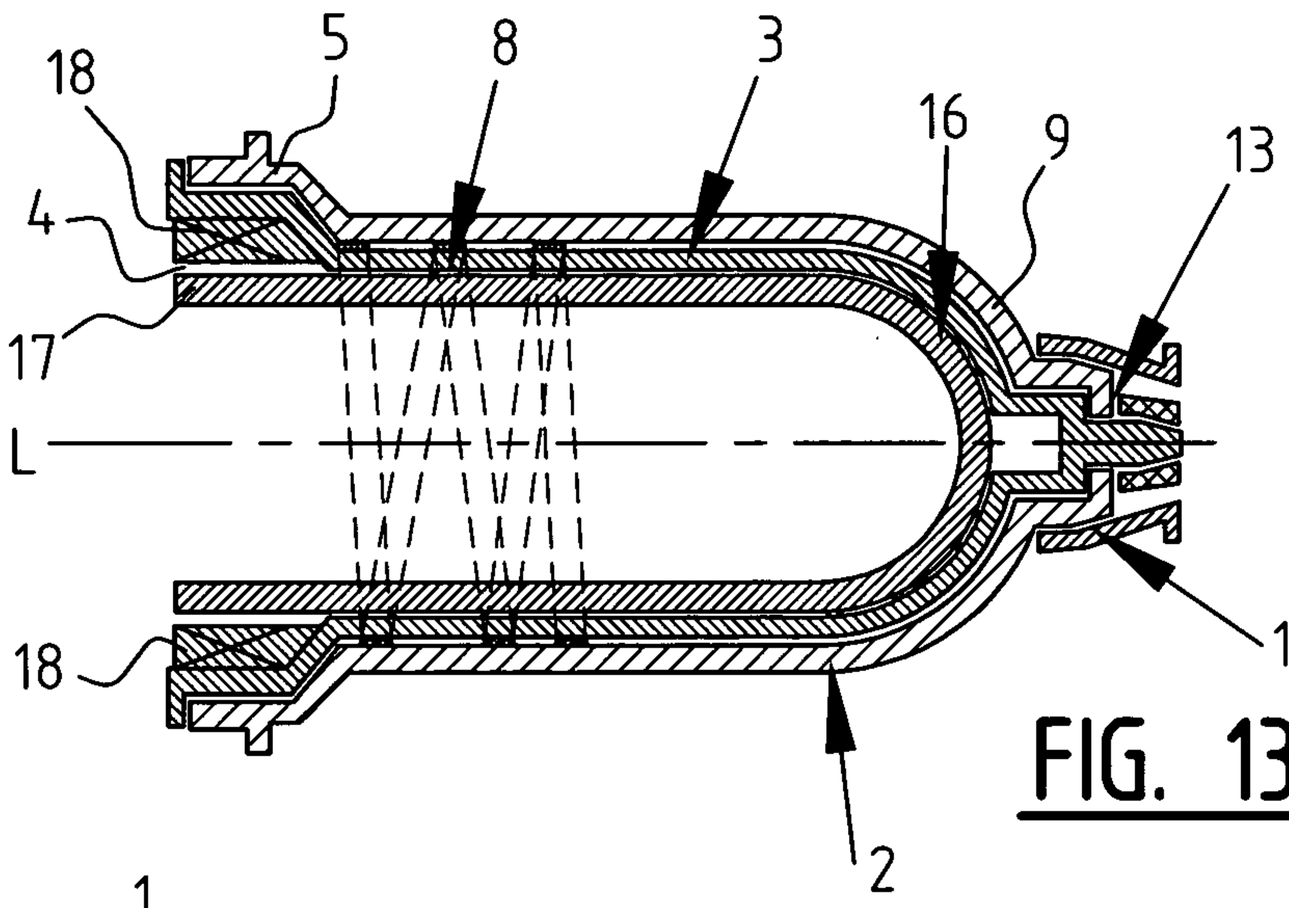

FIG. 13

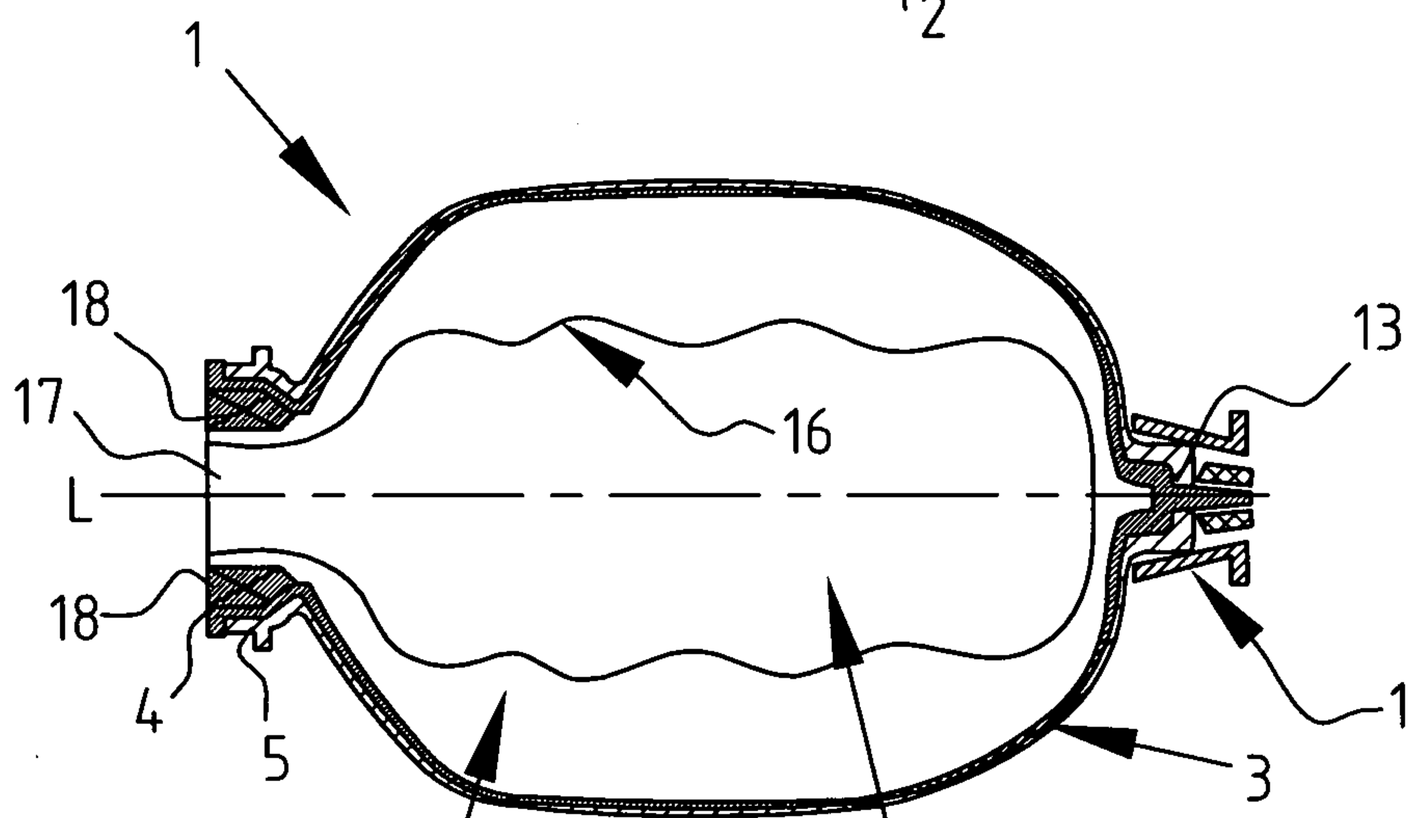

FIG. 14

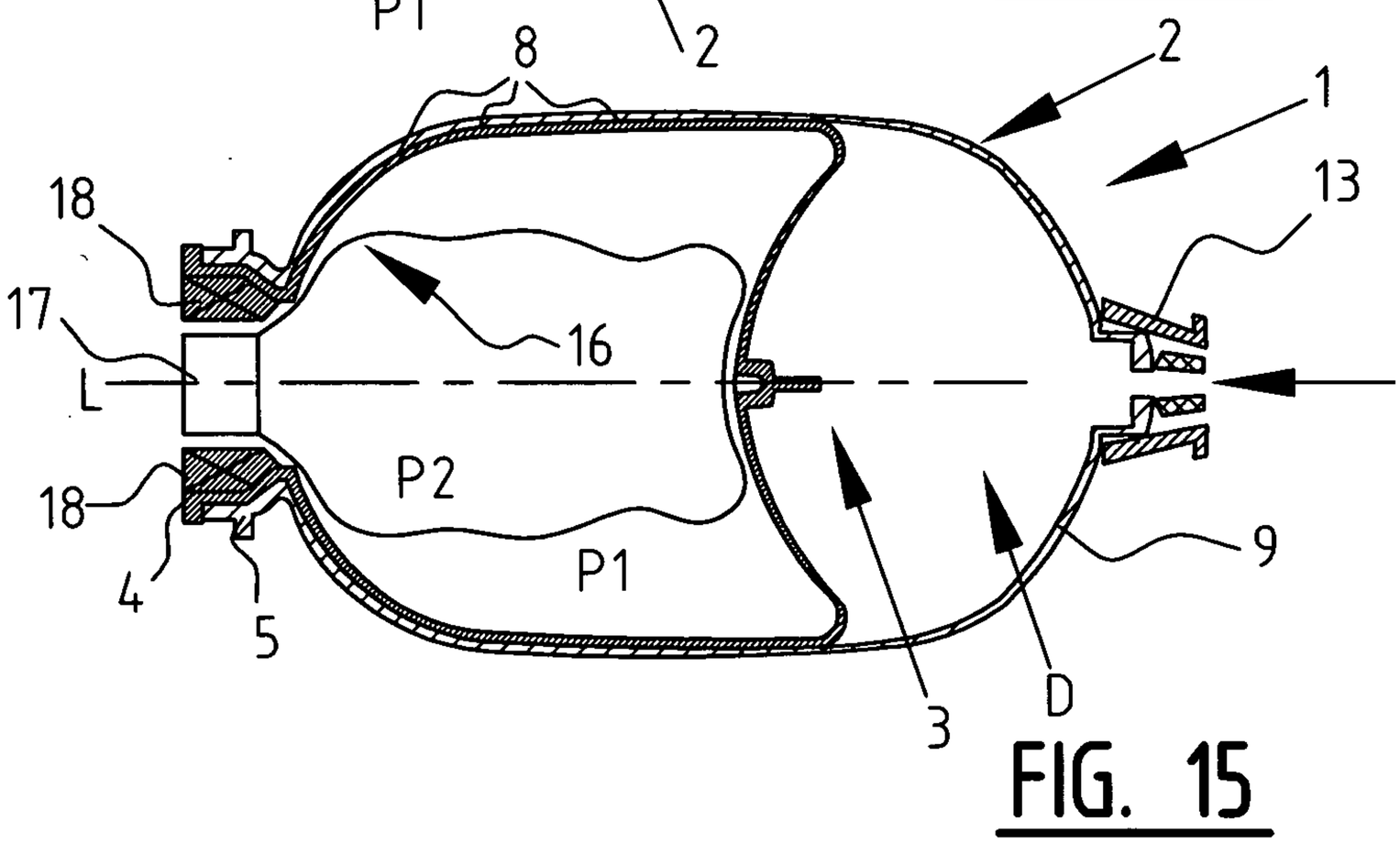

FIG. 15

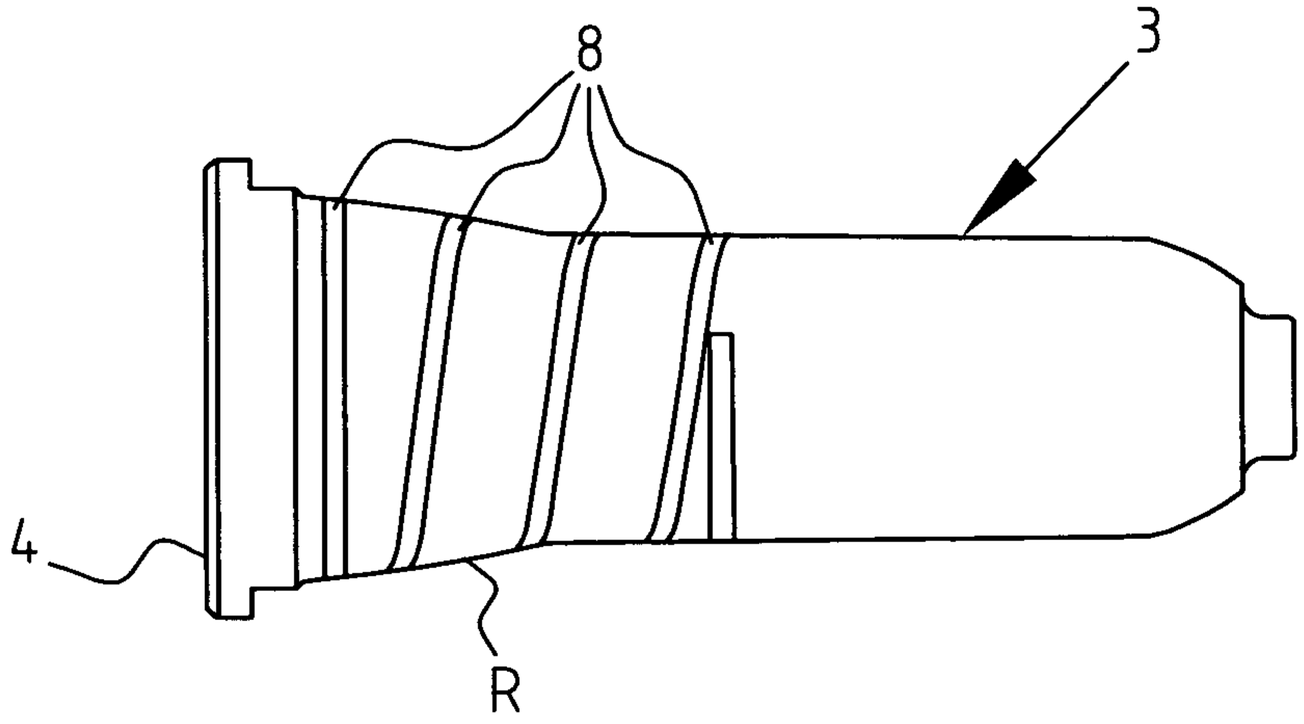

FIG. 16

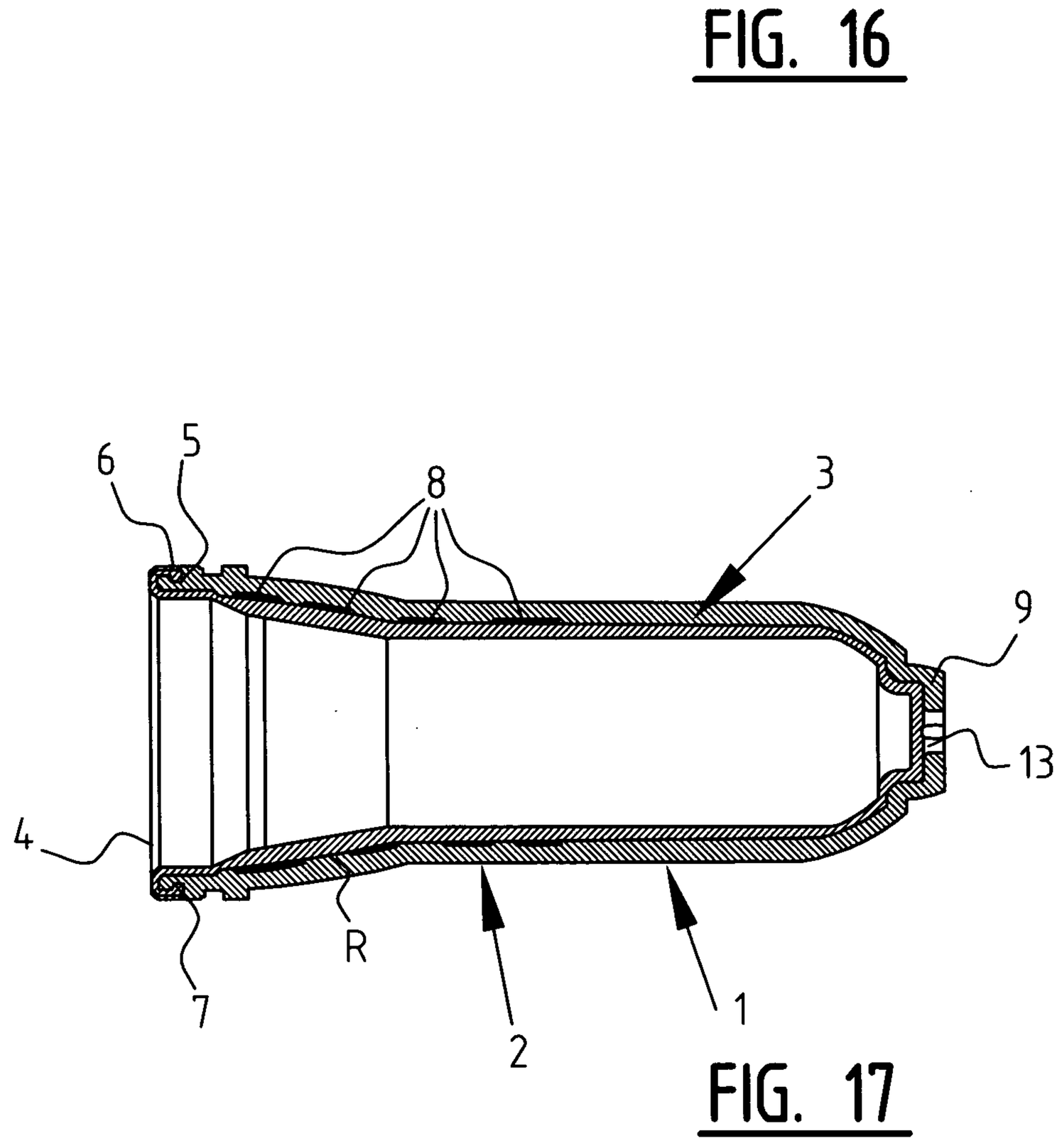

FIG. 17

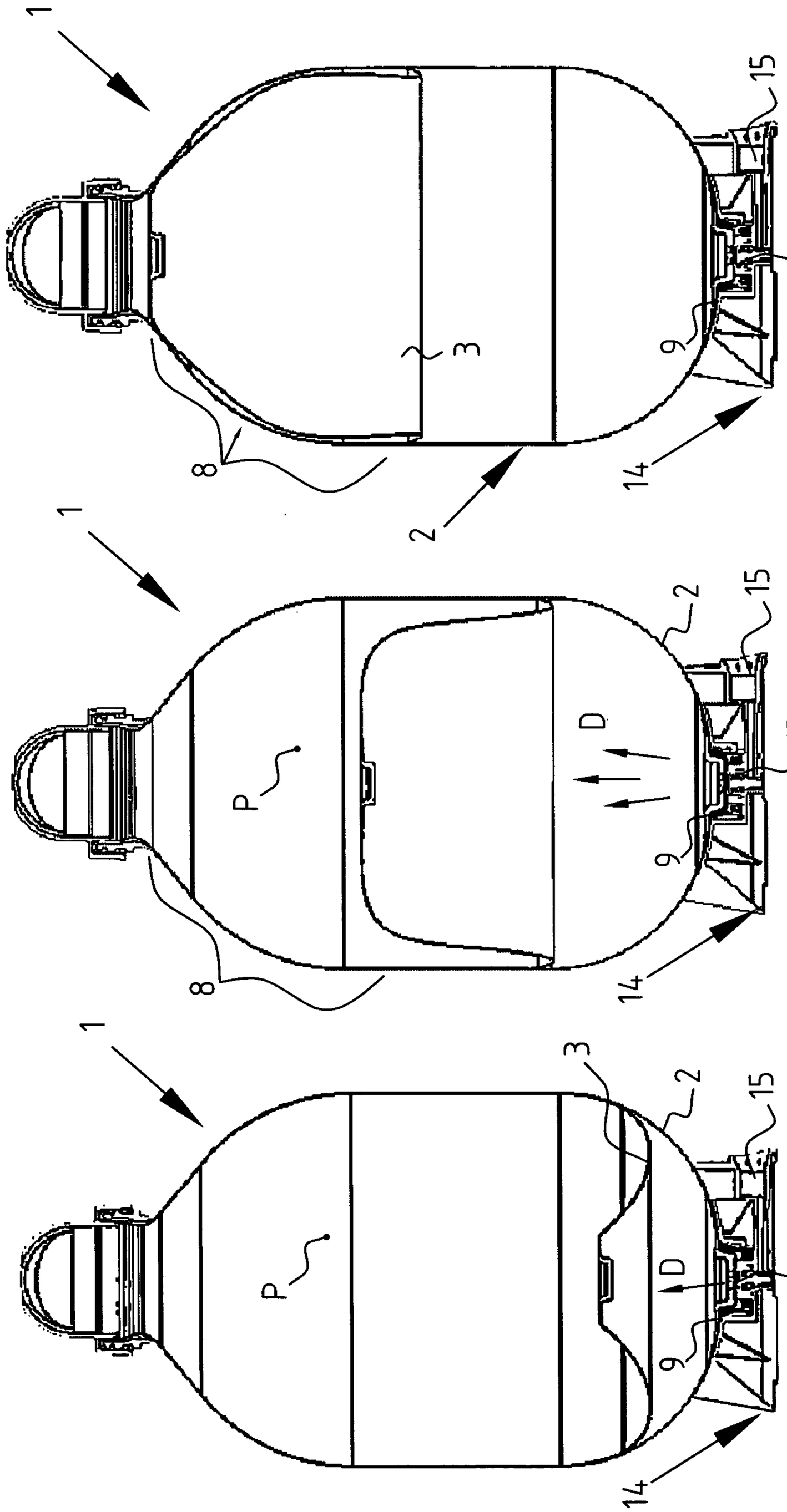

FIG. 20

FIG. 19

FIG. 18

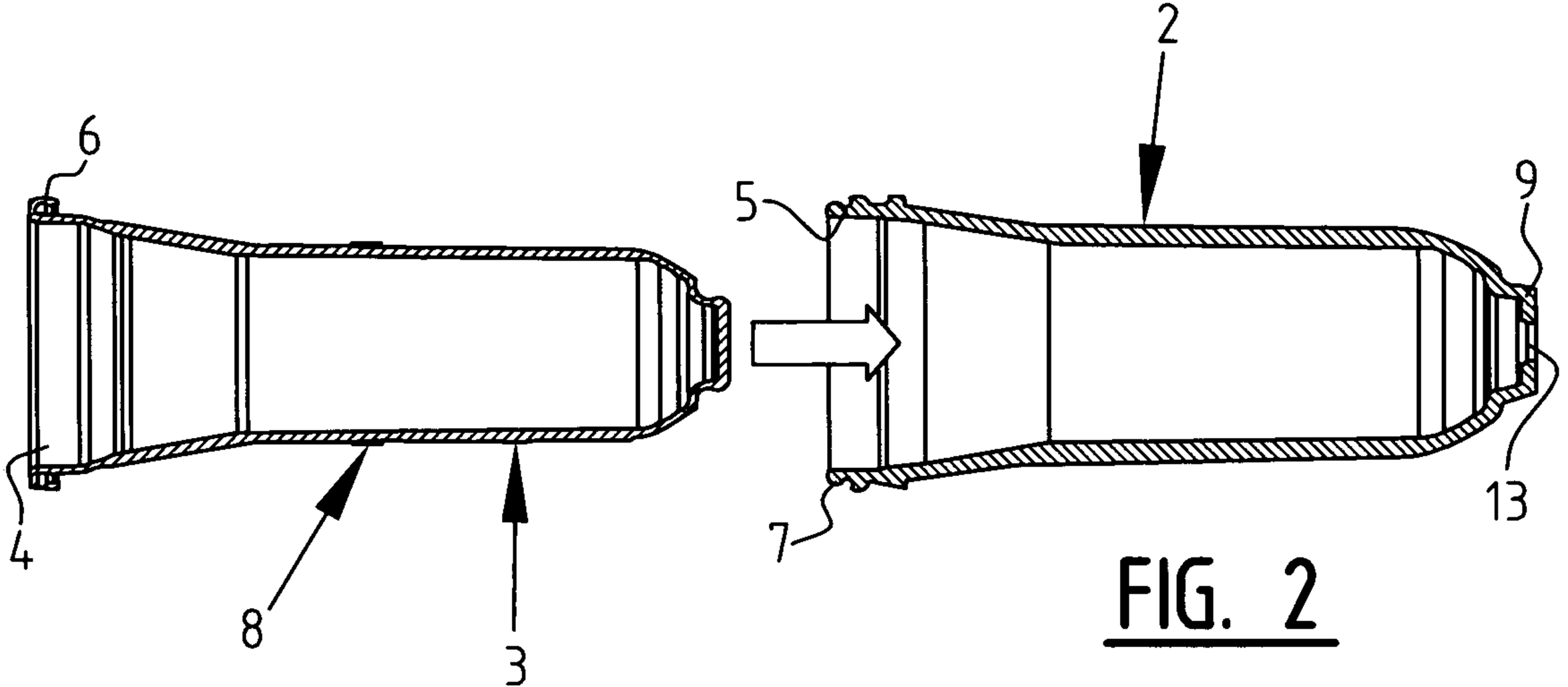

FIG. 2