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(54) CONTAINER WITH POURING SPOUT

(57) A container (1) for storing fluid products has a pouring spout (3), which has a connecting portion (4) and a pouring tube (5). The pouring tube extends from the connecting portion in a direction diverging at an angle relative to a central axis (17) of the connecting portion. A recess (14) is formed in a shoulder portion (13) of a body portion (2) of the container and, adjacent the shoulder portion, in a wall portion (12) of the body portion. The recess is open in a horizontal outward direction. In a storage position the pouring spout (3) is arranged partially in the recess with the pouring tube at least partially recessed in the wall portion and the connecting portion located at least partially above the shoulder portion. The pouring tube (5) diverges from said central axis in an outward direction when the pouring spout is in the storage position.

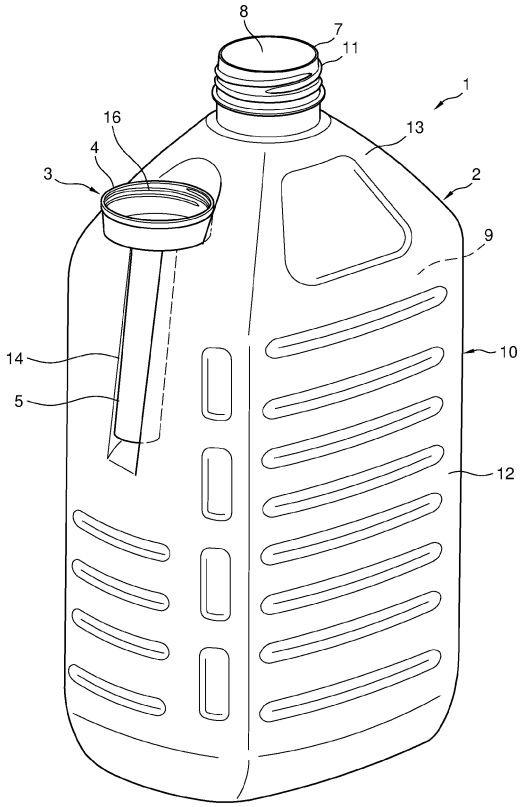

Fig. 1

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Description

FIELD AND BACKGROUND OF THE INVENTION

[0001] The invention relates to a container for storing fluid products, which is provided with a pouring spout detachably attached to the container in a storage position for mounting in an operative position to a pouring opening of the container with a pouring channel of the pouring spout in operative communication with an interior space of the container via a pouring passage of the container.

[0002] Such containers are known from practice, for instance as packaging of windscreen washer liquid or Adblue® (an aqueous urea solution consumable in selective catalytic reduction (SCR) converters of diesel engines) and as petrol containers. In some of such containers, the pouring spout is stored in an opening bounded by a handle portion of the container. In other of such containers, the spout is arranged in a recess in a side wall of the container.

[0003] However, in such positions, the spout occupies relatively much space, so that the total rectangular box volume in which a container with a given capacity fits is increased compared with the total rectangular box volume in which a container of the same capacity but without a pouring spout fits. Moreover detaching of the spout from the storage position and re-attachment of the spout in the storage position is rather cumbersome. In the containers carrying the spout in a recess in a side wall, an adhesive covering label is used for reliably holding the container in place. This needs to be peeled off for detaching the pouring spout and re-attachment can be impaired if the label is damaged or liquid or dirt has reduced the adhesiveness of the label to the container.

[0004] DE 20 2005 006 134 U1 discloses in its Figs. 6, 7, 8 a container according to the pre-characterizing portion of the appended independent claim 1.

SUMMARY OF THE INVENTION

[0005] It is an object of the present invention to provide a container for storing fluid products, with a container body which can be blow molded and with a pouring spout of which the pouring spout can be detached from a mounting position more quickly and easily, occupies very little space, and in particular does not or hardly add to a rectangular box space in which a container of a given internal volume fits, and which can be manufactured efficiently with minimal effect on strength and amount of material used.

[0006] This object can be achieved by a providing a container according to the appended independent claim 1.

[0007] Because, according to the invention, a recess is formed in the shoulder portion and, adjacent the shoulder portion, in the wall portion, the recess being open in horizontal outward direction, and because the pouring spout in a storage position is arranged partially in the recess with the pouring tube at least partially recessed in the wall portion and the connecting portion located at least partially above the shoulder portion, the pouring spout can be detached quickly by an upward and/or outward movement, the connecting portion is at least partially above the shoulder in an empty space to the side of and generally below the neck so it occupies very little or no additional space and does not add significantly to the footprint of the container and the recess is located in an area where wall material is deformed to a relatively small extent during blow molding and therefore has some spare deformability to deform to a shape bounding the recess. Accordingly, strength and material use are not or only minimally affected by providing the recess.

[0008] Furthermore, according to the invention, the pouring tube extends from the connecting portion in a direction at an angle diverging relative to the central axis of the connecting portion, wherein the pouring tube diverges from the central axis of the connecting portion in an outward direction when the pouring spout is in the storage position. This allows the recess to have a depth that decreases from the shoulder in a direction away from the neck, which in turn is advantageous in that the recess can be obtained with relatively little additional deformation of wall material in the vicinity of the recess as the fluid storage portion of the container body is formed during blow molding.

[0009] Further features, effects and details of the present invention are described below with reference to a preferred embodiment which is shown in the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

Fig. 1 a perspective view of an example of a container according to the invention;

Fig. 2 a top view of the container shown in Fig. 1;

Fig. 3 a cut-off cross-sectional along a plane III-III in Fig. 2; and

Fig. 4 a cut-off cross-sectional along a plane IV-IV in Fig. 3.

DETAILED DESCRIPTION

[0011] In the drawings, an example of a container according to the invention is shown. The container 1 has a body 2 of polymer material for storing fluid products and a pouring spout 3 with a connecting portion 4 and a pouring tube 5 projecting from the connecting portion 4. A pouring channel 6 extends through the connecting portion 4 and the pouring tube 5. The pouring spout 3 can for instance be of a design as described and shown in applicant's Dutch patent application 2 023 437.

[0012] The container body 2 has a neck 7 bounding a

passage 8 into an internal space 9 of the container body 2 and a fluid storage portion 10, which is located below the neck 7 when the container 1 is in an upright position. The neck 7 has a protrusion 11 for engagement to a closure (not shown) and, when the closure has been removed, to the connecting portion 4 of the pouring spout 3 with the pouring channel 6 in fluid communication with the passage 8 of the neck 7. The protrusion 11 of the neck forms an external thread for engagement with an internal thread 16 of the connecting portion 4 of the spout 3. Instead of or in addition to one or more protrusions, one or more recesses may be provided on the outer circumference of the neck.

[0013] The fluid storage portion 10 has a wall portion 12 located laterally outwardly relative to the neck 7 and a shoulder portion 13 extending from the neck 7 to the wall portion 12. The container body 2 is of a shape which is basically symmetrical about mutually perpendicular vertical planes through a center line of the neck 7. Such a generally bottle like shape is advantageous for storage, boxing, handling and presentation in a shop.

[0014] A recess 14 is formed in the shoulder portion 13 and, adjacent the shoulder portion 13, in the wall portion 12. The recess 14 is open in a horizontal outward direction 15. When the pouring spout 3 is in a storage position as shown in the drawings, it is arranged partially in the recess 14 with the pouring tube 5 recessed in the wall portion 12 and the connecting portion 4 located partially above the shoulder portion 13.

[0015] When the container 1 is in the upright position, the pouring spout 5 can be detached from the container body 2 quickly by an upward and/or outward movement in which the pouring tube 5 of the pouring spout 3 is moved axially and/or laterally out of the recess 14. The pouring spout 3 can also be gripped easily by an outwardly facing portion of the connecting portion 4, so it can be taken out of the storage position and put back into the storage position particularly easily.

[0016] When the pouring spout 3 is in the storage position as shown, the connecting portion 4 is at least partially above the shoulder 13 in an empty space to the side of and generally below the neck 7 so it occupies very little or no additional space. As is best seen in Fig. 2, the pouring spout 3 in the storage position and does not add significantly to the footprint of the container 1. As is best seen in Fig. 3, the pouring spout 3 in the storage position and does not add significantly to the size of a rectangular box shape 16 in which a container 1 with a given capacity fits. Furthermore, the recess 14 is located in an area where wall material is deformed to a relatively small extent during blow molding and therefore has some spare deformability to deform to a shape bounding the recess 14. Accordingly strength and material use are not or only minimally affected by providing the recess 14.

[0017] The pouring spout 3 in the storage position is arranged with the connecting portion 4 partially recessed in the shoulder portion 4. Thus, the pouring spout 3 in the storage position projects to quite small extent from the container body 2, which is advantageous for avoiding inadvertent dislodgement of the pouring spout 3 during handling or other movements of the container 1, for instance when it is stowed with other items without particular care or when it moves through a luggage or cargo space due to accelerations, decelerations or cornering of a vehicle.

[0018] A container with a recess 14 in the shoulder 13 and, adjacent to the shoulder, in the wall portion 12 of the fluid storage portion 10 is particularly suitable for blow molding the container body 2 from an injection molded preform of a Polyethylenterephthalat (PET) polymer material.

[0019] Manufacturing the containers body 2 by stretch blow molding from a preform of a PET polymer, which may be a PET homolpolymer or a copolymer, such as a copolymer of PET and isophthalic acid or a copolymer of PET, isophthalic acid and a glycol complex (PETG), could at least reduce the occurrence of leakage due to damaged containers, since PET containers that have been stretch blow molded from an injection molded perform are typically stronger than containers blow molded from a tube of other, e.g. polyolefin, material. PET crystallizes at large strains during warm deformation processing. The imparted crystallinity increases its stiffness and strength, improves its dimensional stability, and increases its density. (Dupaix, Rebecca B.; Temperature and rate dependent finite strain behavior of poly(ethylene terephthalate) and poly(ethylene terephthalate)-glycol above the glass transition temperature; Thesis (Ph. D.)-Massachusetts Institute of Technology, Dept. of Mechanical Engineering, 2003.

[0020] While manufacturing such a container from PET material is advantageous in view of its high strength, crystal clear transparency and suitability for recycling, PET material has a relatively small deformability during blow molding. In a stretch blow molding process, the preform is heated (for instance by infrared heaters) until its temperature is above its glass transition temperature. Then, high pressure air is blown into the preform, which causes the portion of the preform inside the mold cavity that is spaced from the inner surface of the mold to be expanded until it contacts the inner surface of the mold. During the expansion, the PET material is bi-axially stretched beyond the natural stretch ratio of the polymer (for instance 10 - 12 for a Co-PET, at blowing temperature of 95 °C) and thereby strain hardened, preferably before contacting the inner surface of the mold, due to crystallization and orientation of the polymer material. The preform may initially be stretched with a core rod to achieve initial elongation in axial direction. Around the mold portion for forming the recess 14, the wall material of the preform is less restrained by the inner surface of the mold for controlling deformation up to a predetermined shape corresponding to the shape of the mold cavity than at the recess.

[0021] To form portions of the shoulder 13 adjacent the recess 14, the wall material has to be able to bulge out to the mold wall on either side of the recess forming

portions, within limitations imposed by the strain hardening effect. Since the wall material in the vicinity of the recess is deformed relatively little during blow molding, the portions of the shoulder 13 adjacent the recess 14 can bulge out to the mold wall on either side of the recess forming portions even if the wall material has a relatively small deformability as is typical for PET material.

[0022] After the preform has been expanded to a shape conforming to the shape of the mold cavity it preferably has been expanded to such an extent that strain hardening has occurred, to such an extent that at least a substantial portion of the fluid storage portion 10 is formed of strain hardened wall material.

The connecting portion 4 has a cylindrical wall having a central axis 17 and the pouring tube 5 extends from the connecting portion 4 in a direction at an angle a diverging relative to the central axis 17 of the connecting portion 4. This facilitates pouring out of liquid out of the container 1 when the pouring spout 3 has been attached to the neck 7. When the pouring spout 3 is in the storage position, the pouring tube 5 diverges from the central axis 17 of the connecting portion 4 in an outward direction. This allows the recess 14 to have a depth that decreases from the shoulder 13 in a direction away from the neck 7, which in turn is advantageous in that the recess 14 can be obtained with relatively little additional deformation of wall material in the vicinity of the recess 14 as the fluid storage portion 10 of the container body 2 is formed during blow molding.

[0023] For reliably holding the pouring spout 3 in the storage position without requiring additional provisions for that purpose, such as an adhesive, an opening 18 of the recess 14 in the shoulder portion 13 and in the wall portion 12 in outward horizontal direction is at least partially of a width w_o smaller than an outer width w_t of an adjacent portion of the pouring tube 5 in the storage position. Thus, removing the pouring spout 5 in an outward direction requires that a substantial force is exerted for bending opposite walls of the recess 14 away from each other, so that the pouring spout 5 is normally prevented from inadvertently becoming dislodged from the storage position. Preferably, the pouring spout 5 is also slightly clamped in the recess 14, so that inadvertent dislodgement in an upward direction is also counteracted.

Claims

1. A container (1) comprising a body (2) of polymer material for storing fluid products and a pouring spout (3) with a connecting portion (4) and a pouring tube (5) projecting from the connecting portion, wherein a pouring channel (6) is extending through the connecting portion and the pouring tube, and wherein the connecting portion (4) has a cylindrical wall having a central axis (17),
wherein the container body (2) comprises a neck (7) bounding a passage (8) into an internal space (9) of the container body and a fluid storage portion (10) below the neck when the container is in an upright position, the neck (7) having at least one protrusion (11) or recess for engagement to a closure and to the connecting portion (4) of the pouring spout (3) with the pouring channel in fluid communication with the passage of the neck,
wherein the fluid storage portion (10) has a wall portion (12) located laterally outwardly relative to the neck (7) and a shoulder portion (13) extending from the neck (7) to the wall portion (12),
wherein a recess (14) is formed in the shoulder portion (13), the recess (14) being open in horizontal outward direction (15), and
wherein the pouring spout (3) in a storage position is arranged partially in the recess (14) with the connecting portion (4) located at least partially above the shoulder portion (13),
characterized in that:

said recess (14) additionally is formed in the wall portion (12) adjacent the shoulder portion (13), in said storage position the pouring spout (3) additionally is arranged partially in the recess (14) with the pouring tube (5) at least partially recessed in the wall portion (12), and
the pouring tube (5) extends from the connecting portion (4) in a direction at an angle (α) diverging relative to the central axis (17) of the connecting portion (4), wherein the pouring tube (5) diverges from the central axis (17) of the connecting portion (4) in an outward direction when the pouring spout (3) is in the storage position.

2. A container (1) according to claim 1, wherein the pouring spout (3) in the storage position is arranged with the connecting portion (4) at least partially recessed in the shoulder portion (13).

3. A container (1) according to claim 1 or 2, wherein the body (2) is blow molded from an injection molded preform of a Polyethylenterephthalat (PET) polymer material.

4. A container (1) according to claim 3, wherein at least a substantial portion of the fluid storage portion (10) is formed of strain hardened wall material.

5. A container (1) according to any of the preceding claims, wherein the protrusions and/or the recesses of the neck (7) form an external thread for engagement with an internal thread of the connecting portion (4) of the pouring spout (3).

6. A container (1) according to any of the preceding claims, wherein the opening (18) of the recess (14) in the shoulder portion (13) and in the wall portion (12) in the outward horizontal direction (15) is at least

partially of a width (wo) smaller than an outer width (wt) of an adjacent portion of the pouring tube (5) in the storage position.

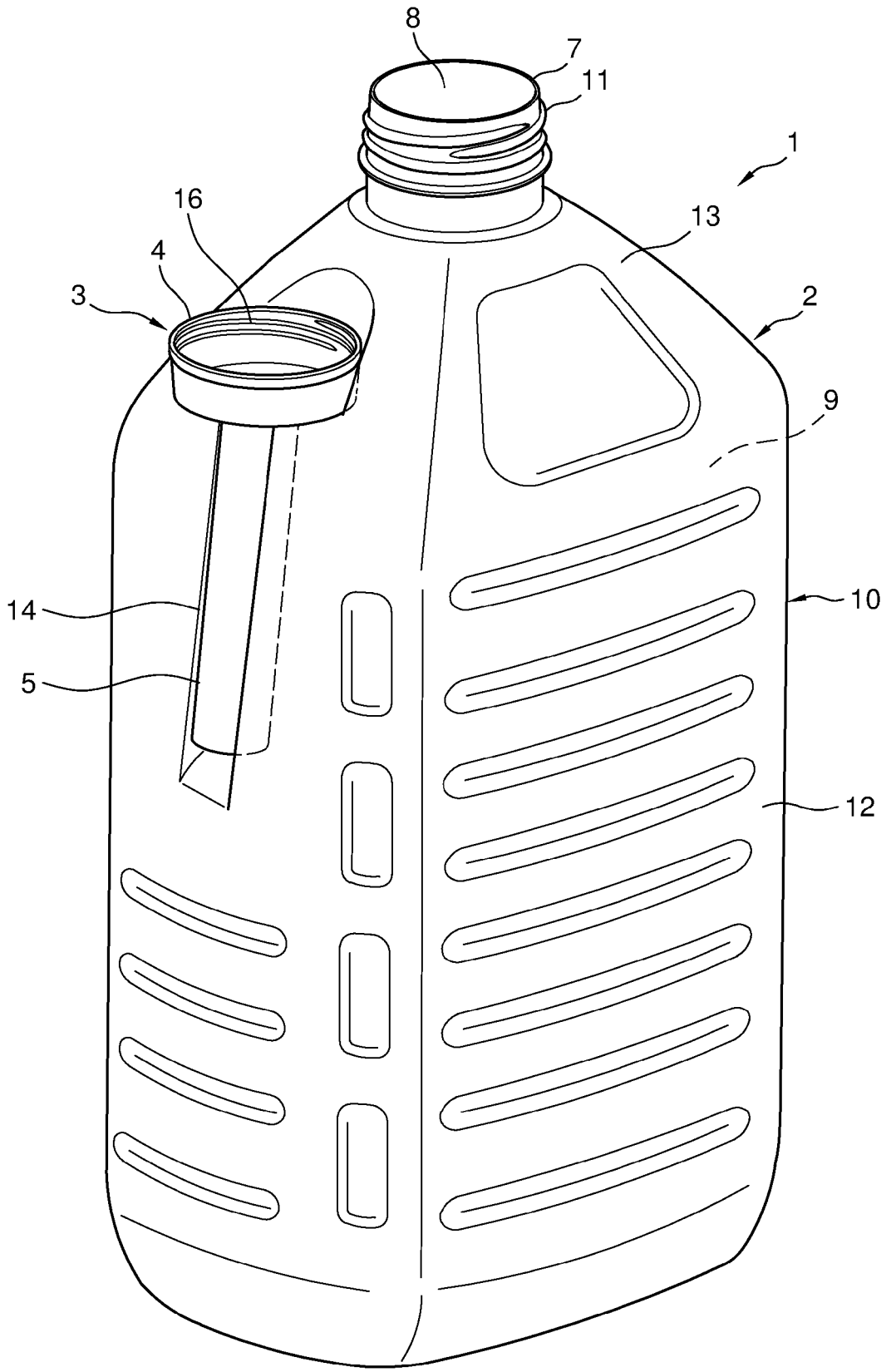

Fig. 1

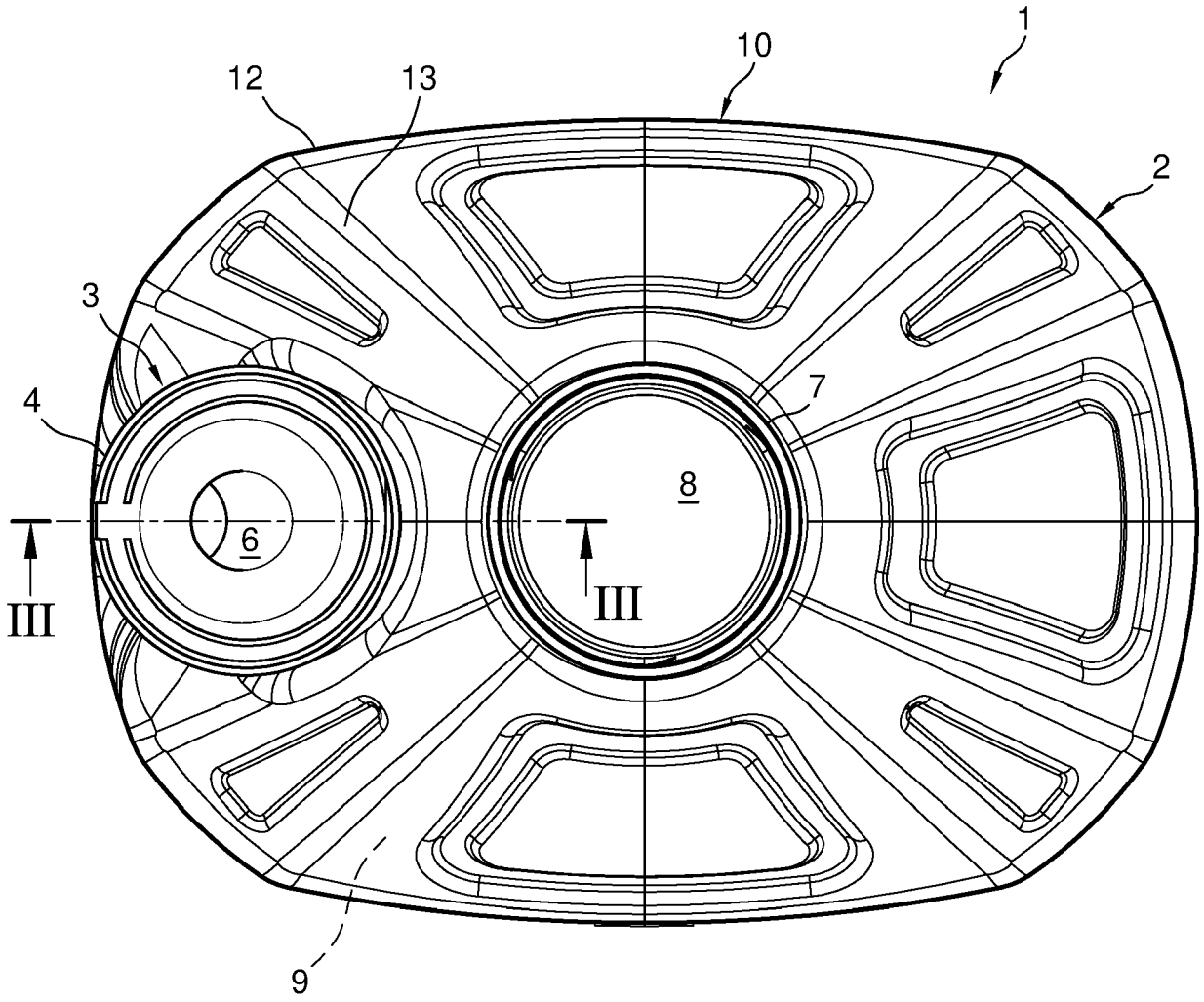

Fig. 2

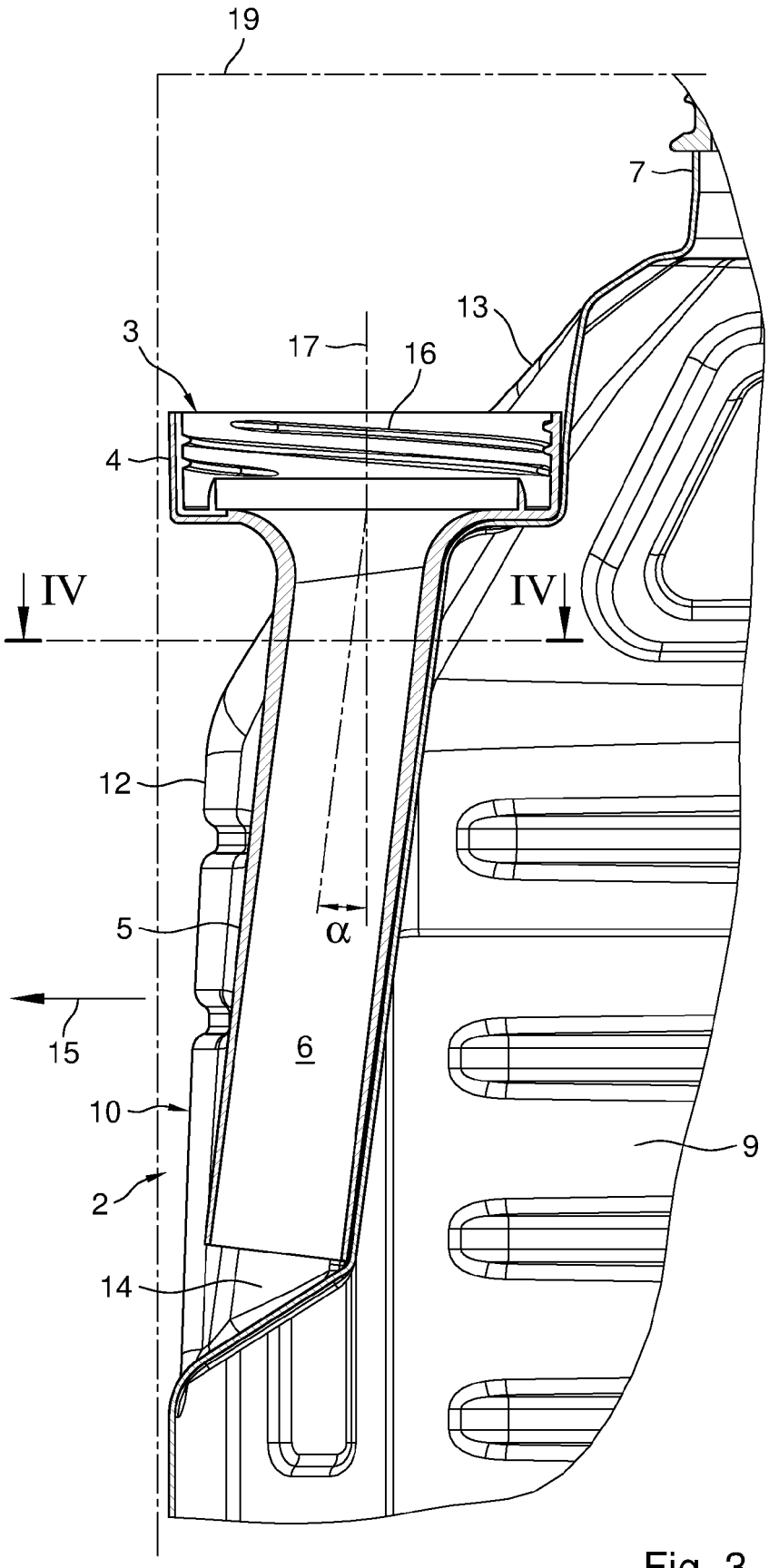

Fig. 3

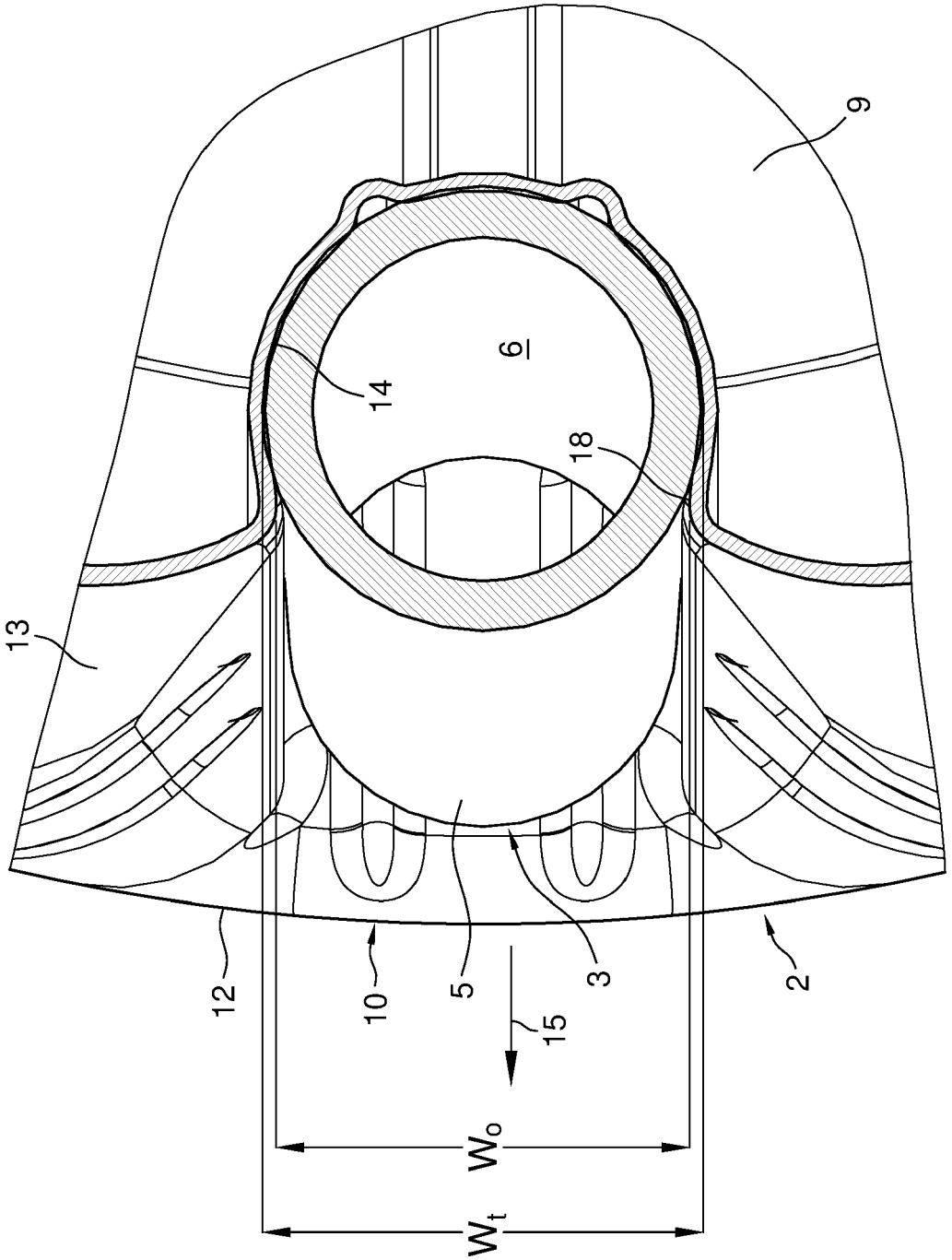

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 20 20 2754

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A	FR 2 715 125 A1 (SAFET EMBAMET [FR]) 21 July 1995 (1995-07-21) * claims; figures * -----	1-6	TECHNICAL FIELDS SEARCHED (IPC) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	18 December 2020	Serrano Galarraga, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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D : document cited in the application
L : document cited for other reasons

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 20 2754

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