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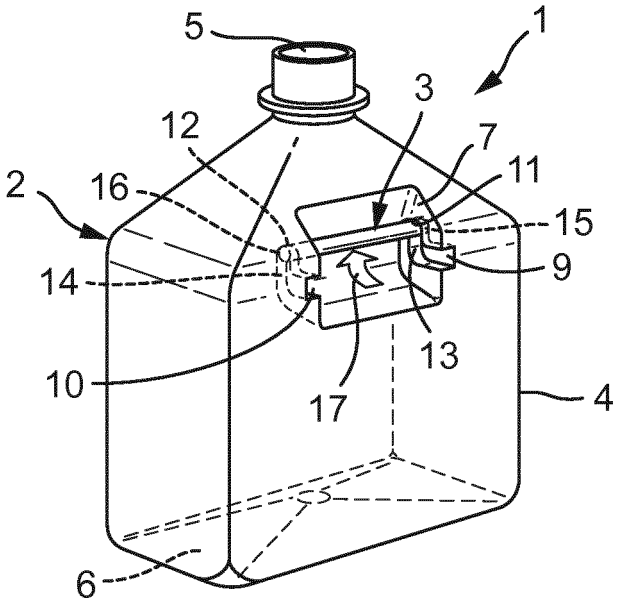
## (54) CONTAINER HAVING A CONTAINER BODY AND A HANDLE MOUNTED THERETO

(57) Container having a container body (2, 52, 102, 152, 202) and a handle (3, 153, 203) mounted thereto. The container body has mutually opposite upright container wall portions (7, 8, 157, 158) having mutually opposite outer surface portions facing each other. A first recess in the form of a slot (9, 59, 109, 159, 209) is provided in one of the mutually opposite upright container wall portions. The slot has a dead end (11, 61, 111, 161, 211) closed in longitudinal direction of an adjacent portion of the slot. This longitudinal direction has an upward directional component towards the dead end. A second recess (10, 160, 210) is provided in the other one of the mutually opposite container wall portions. One of the end portions (15, 215) of the handle is lodged in the slot adjacent to the dead end, the other one of the end portions (16, 216) is lodged in the second recess.

Fig. 1

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## Description

### FIELD AND BACKGROUND OF THE INVENTION

**[0001]** The present invention is relates to a container having a container body and a handle mounted thereto.

**[0002]** Containers with handles, such as blow moulded or injection moulded plastic containers as well as glass and metal containers are known in numerous forms, many with integrally formed handles. However, many designs are compromised ergonomically and/or from the point of optimal use of storage space. Moreover, it is technically difficult and relatively expensive to mould a handle integrally with a side portion of a container.

**[0003]** Therefore, other designs provide for a separately manufactured handle that is then attached to the container body. For instance, U.S. patent 5 469 612 and U. S. patent 5 637 167 disclose container bodies each having a handle fitted thereto by elastically deforming the handle and allowing the handle to spring back into engagement with the container body. A problem of such containers is that the handles tend to become dislodged from the container body relatively easily, in particular if the container body has a large internal volume and is accordingly heavy when full.

**[0004]** U.S. patent 5 637 167 also discloses a container body having a handle fitted thereto by snapping studs of the handle into hollow posts projecting inwardly into the container body. Such containers are difficult to manufacture, in particular because of the need of forming the hollow posts. Moreover, the studs can snap out of the hollow posts relatively easily.

**[0005]** U.S. patent 5 637 167 also discloses a container body having a handle fitted thereto by sliding over a dovetail boss of the container body. Such a container is relatively expensive, because the container body and the handle are difficult to mould.

**[0006]** U.S. patent 7 103 940 discloses a container with a handle that may be removably attached to a container body. The container has spaced first and second knobs. The handle is configured as a split tubular member having a central portion and openings at opposite ends each receiving one of the knobs. The split tubular member has relatively sharp edges extending over its length, which are unpleasant for gripping, visually displeasing and dirt can easily accumulate in the open hollow space in the split tubular member.

### SUMMARY OF THE INVENTION

**[0007]** It is an object of the invention to provide a user-friendly container with a container body and a handle mounted thereto of which manufacturing costs are low and of which the handle has a high resistance against becoming dislodged.

**[0008]** According to the invention, this object is achieved by providing a container according to claim 1.

**[0009]** Because at least one of the opposite end portions of the handle is lodged in a dead end portion of a slot in one of mutually opposite upright container wall portions, which dead end portion has an upward directional component towards the dead end, that end portion of the handle can easily be introduced in the slot and shifted until it abuts the dead end of the slot. In use, the handle, of which the other opposite end is lodged in the second recess in the other one of the mutually opposite, upright wall portions, does not become dislodged from the dead end portion of the slot easily, because holding the container by the handle causes the handle to be urged upwardly against the dead end of the slot. It is advantageous for low manufacturing costs that the slot can easily be formed in the wall of the container body, for instance integrally while forming the container body, and that no particular complicated shape of the handle is required for engaging the slot.

**[0010]** Particular elaborations and embodiments of the invention are set forth in the dependent claims.

**[0011]** Further features, effects and details of the invention appear from the detailed description and the drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0012]**

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

Fig. 2 is a side view of an upper portion of the container shown in Fig. 1;

Fig. 3 is a perspective view of a wall portion of a second example of a container according to the invention, without the handle;

Fig. 4 is a perspective view of a wall portion of a third example of a container according to the invention, without the handle;

Fig. 5 is a schematic, fragmentary, top view in cross-section view of an example of a mould for moulding a container body of a container according to the invention;

Fig. 6 is a perspective view of a slide of the mould shown in Fig. 5;

Fig. 7 is a side view of a fourth example of a container according to the invention;

Fig. 8 is a schematic top view in cross-section along the line VIII-VIII in Fig. 7; and

Fig. 9 is a side view of a fifth example of a container according to the invention.

### DETAILED DESCRIPTION

**[0013]** First, the invention is discussed with reference to a first example of a container 1 according to the invention shown in Figs. 1 and 2. The container 1 has a container body 2 and a handle 3 mounted thereto. The container body 2 has a container wall 4 bounding a storage space inside the container wall 4 that surrounds the stor-

age space. The container body 2 may for instance be blow moulded from a tube or preform of plastic material such as Polyethylene terephthalate (PET) or a polyolefin such as Polyethylene (PE) or Polypropylene (PP). Providing a blow moulded container with a handle mounted thereto is particularly advantageous for containers with a container body of PET material, in view of the limited deformability of PET material during moulding and the resulting constraints regarding shapeability and the particular suitability of PET material for forming containers of sufficient strength to carry a large volume of a product and, accordingly, a large weight. However, the container body may also be of other material(s), such as glass, steel, aluminium and/or injection moulded plastic and can be integrally formed or composed of parts attached to each other.

**[0014]** The container body 2 has an opening 5 communicating with the storage space at an upper end of the container body 2 and a bottom 6 at a lower end of the container body. The container wall 4 extends between the opening 5 and the bottom 6 and has an outer surface and mutually opposite upright container wall portions 7, 8 having mutually opposite outer surface portions facing each other.

**[0015]** A first recess 9 in the form of a slot is provided in one of the mutually opposite upright container wall portions 7. The slot 9 has a dead end 11 closed in longitudinal direction of an adjacent portion 13 of the slot 9. The longitudinal direction of this portion 13 of the slot 9 adjacent to the dead end 11 has an upward directional component towards the dead end 11.

**[0016]** A second recess 10 is provided in the other one of the mutually opposite container wall portions 8. In the present example, also this second recess is in the form of a slot having a dead end 12 closed in longitudinal direction of an adjacent portion 14 of the slot 10, the longitudinal direction of this portion 14 of the slot 10 adjacent to the dead end 12 having an upward directional component towards the dead end 12. The slots 9, 10 both have a closed bottom, so these slots 9, 10 constitute troughs formed of wall material of the wall 4 of the container body 2 and not openings through which the storage space of the container body 2 communicates with the environment, since such openings would allow contents of the container body to flow out of the container body.

**[0017]** The handle 3 has opposite end portions 15, 16. One of the end portions 15 is lodged in the first slot 9 adjacent to the dead end 11. The other one of the end portions 16 is lodged in the second slot 10 adjacent to its dead end 12.

**[0018]** In mounted condition, the opposite end portions 15, 16 of the handle 3 are positioned against the closed dead ends 11, 12 of the slots 9, 10. When the container 1 is lifted and carried by holding the handle 3, an upward force is exerted onto the handle 3 and transferred to the container body via the end portions 15, 16 of the handle 3 that are lodged in the slots 9, 10 and that are in abutment with the dead ends 11, 12 of the slots 9, 10, because the portions 13, 14 of the slots 9, 10 adjacent to the dead ends 11, 12 extend towards the dead ends 11, 12 in directions with an upward directional component. Accordingly, it is reliably ensured that the forces exerted onto the handle 3 while lifting and carrying the container 1, urge the end portions 15, 16 of the handle 3 firmly into the end position in the slots and do not result in the handle 3 becoming dislodged from the slots 9, 10. Nevertheless, mounting the handle 3 to the container body 2 can be carried out very easily by inserting the end portions 15, 16 of the handle 3 into the slots 9, 10 from the ends of the slots 9, 10 opposite the dead ends 11, 12 and translatingly sliding the handle 3 with its opposite end portions 15, 16 in the slots 9, 10 until its opposite end portions 15, 16 are in abutment with the dead ends 13, 14 of the slots 9, 10, as indicated by arrow 17 in Fig. 1. Also dismounting of the handle 3 can be carried out very easily, by moving the end portions 15, 16 through the slots 9, 10 away from the dead ends 13, 14 until the handle is free from the slots 9, 10. This is advantageous for separating different materials for recycling and allows handles 3 to be re-used for mounting to another container body.

**[0019]** The slots 9, 10 each extend from an open end open in longitudinal direction of an adjacent slot portion to the dead end 11, 12, so that the handle 3 can easily be inserted into the slots 9, 10 via the open ends thereof.

**[0020]** The slots 9, 10 have further portions extending from the slot portions 13, 14 adjacent to the dead ends 11, 12 in directions deflected outwardly relative to the directions in which the slot portions 13, 14 adjacent to the dead ends 11, 12 are oriented away from the dead ends 11, 12. Thus, the handle 3 can easily be mounted by a translator movement that is initially directed with an inward directional component and then directed more upwardly, while the slot portions 13, 14 adjacent to the dead ends 11, 12 can be oriented substantially vertically, which is advantageous for reliably holding the handle 3 engaged with the slots 9, 10, also if the container 1 is tilted for pouring out contents via the opening 5.

**[0021]** The opposite end portions 15, 16 of the handle 3 are at substantially the same level, so that virtually no force in longitudinal direction from one handle end to the other handle end is exerted when the container 1 is lifted or carried. Such a force in longitudinal direction from one handle end to the other handle end could result in one handle end becoming dislodged if the mutually opposite, upright wall portions 7, 8 are relatively flexible.

**[0022]** The handle 3 is moreover oriented substantially horizontally, which facilitates holding the container 1 while tilting it for pouring from the container 1.

**[0023]** The handle 3 is an essentially straight bar and may for instance be in the form of a metal tube or a stem of wood. Such a handle can be manufactured at very low costs and can relatively easily be sourced locally where the containers are finalized, for instance by blow moulding, which allows making savings on transport costs.

**[0024]** In Figs. 3 and 4 examples of slots 59, 109 of further examples of a container 51, 101 according to the

invention are shown. On both examples, the container bodies 52, 102 have slots 59, 109 provided with a barrier 68, 118 near the dead end 61, 111 for retaining an end portion of the handle at the dead end 61, 111 of the slot 59, 109. Thus, the risk of inadvertent dislodging of the mounted handle is reduced.

**[0025]** In the example shown in Fig. 3, the barrier is in the form of a bump 68 forming constriction 69 in the slot 59 between a handle holding slot portion 70 adjacent to the dead end 61 and an assembling portion 71 of the slot 59 adjacent to the handle holding portion 70. The handle, which has a thickness larger than the width of the constriction 69 can be mounted by forcing an end portion of the handle through the constriction, causing the container wall portions forming the bump 68 and an opposite wall portion of the slot 59, to be bent apart temporarily. If the container body 52 is of a stiff material, such as glass or metal, it can also be provided that the end portion of the handle is temporarily squeezed together as it is forced through the constriction.

**[0026]** In the example shown in Fig. 4, the barrier is in the form of a step 118 in the slot 109 from a handle holding slot portion 120 adjacent to the dead end 111 to an assembling portion 121 of the slot 109 adjacent to the handle holding portion 120. The handle holding portion 120 is of a larger depth than the assembling portion 121. By providing that the handle is of a length larger than the distance between the (vertical) bottom of the assembling portion 121 of the slot 59 and the bottom of the recess (e.g. opposite slot) in the other one of the mutually opposite upright wall portions, the mutually opposite upright wall portions are bent apart in the area of the slot and the opposite recess during mounting of the handle and snap back towards each other when the handle reaches an end position in the handle holding slot portion 120, optionally while remaining under some tension due to the handle still biasing the mutually opposite upright wall portions apart to some extent after the mutually opposite upright wall portions have snapped back towards each other. If the container body 102 is of a stiff material, such as glass or metal, it can also be provided that the end portions of the handle are temporarily pressed together, for instance by causing the handle to buckle, as the handle is forced into the handle holding portion 120 of the slot 109.

**[0027]** A container body having a slot and a recess (e. g. another slot) in upright wall portions having mutually opposite outer surfaces will typically be of a shape that allows the container body to be released from a mould without sliders or otherwise retractable mould portions. In Fig. 5, a portion of an example of a blow mould 22 for forming a container body as shown in Figs. 1 and 2 is shown. The mould 22 has an inner surface 22 and a projection 24 into the mould cavity for forming a recess forming a gripping area into which a handle can be mounted. Side surfaces 25, 26 of the projection 24 are shaped to form the mutually opposite upright wall portions 7, 8 bounding the recess. For forming the slots 9, 10 in the mutually opposite upright wall portions 7, 8, slides 27, 28 are provided. In Fig. 6, the slide 27 is shown in perspective view. The slides 27, 28 are coupled via a toggle lever arrangement 29 to a pneumatic drive piston 30 in a cylinder 31. A chamber in the cylinder 31 on a side of the piston 30 remote from the arrangement 29 may for instance communicate via a port 32 with a pressure source providing the blow moulding pressure, such that the piston 30 pushes the slides 27, 28 out in response to blow moulding pressure being applied for moulding the container body. For causing the piston 30 and, accordingly, the slides 27, 28 to be retracted again, pressure may be applied via port 33 to a cylinder chamber on the side of the piston 30 facing the arrangement 29.

**[0028]** In Figs. 7 and 8 a further example of a container 151 according to the invention is shown. In this container 151, the container body has mutually opposite upright container wall portions 157, 158, in which the slots 159, 160 are formed, of which the outer surfaces face each other, but are not parallel to each other. As is best seen in Fig. 8, the mutually opposite upright wall portions 157, 158 diverge from each other in outward direction and also, to a lesser extent, in upward direction. That the mutually opposite upright wall portions 157, 158 diverge from each other is advantageous for strength and stiffness of the container body 152 in the area of the handle 153 and for reducing the amount of deformation (and accordingly reduction in wall thickness) during shaping of the container body 152 if the container body shape is finalized by blow moulding. In the present example, the vertical bottoms 171, 172 of the slots 159, 160 are mutually parallel to each other, at least in the portions of the slots 159, 160 up to the handle holding portions adjacent to the dead ends 161, 162 of the slots 159, 160. As is best seen in Fig. 8, the depths of the slots 159, 160 tapers off towards the outside of the container body 152, such that the slots 159, 160 do, at least partially, end at some distance from the outer end of the corresponding one of the mutually opposite upright wall portions 157, 158.

**[0029]** In the examples described above, also the second recess is in the form of a slot, which further slot also has a dead end closed in longitudinal direction of an adjacent portion of that further slot. Also, the longitudinal direction of the adjacent portion of the further slot has an upward directional component towards the dead end of the further slot. This facilitates mounting of the handle and allows the handle ends to project over a large distance into the slot without compromising ease of mounting of the handle. However, as shown in the example of a container 201 shown in Fig. 9, it is also possible to provide that the second recess 210 is of another shape than the slot shaped first recess 209. In this example, the second recess 210 is in the form of a hole of circular cross-section and with walls and a bottom formed by wall portions of the container body 202. Mounting of the handle 203 can be accomplished by first inserting one end portion 216 of the handle 203 into the hole and subsequently passing the opposite end portion 215 of the han-

dle 203 into the slot 209 and sliding it through the slot 209 until it abuts the dead end 211 of the slot 209.

**[0030]** Within the framework of the inventions as set forth in the claims, many other embodiments than the examples shown are conceivable. For instance, the container may have two or more handles, the handles may be mounted below the centre of gravity of a filled container instead of, as in the examples shown, above the centre of gravity of a filled container and/or above 75% of the height of the container body. Such a higher-up placement of the handle is advantageous for easy lifting and ensuring that the container tends to assume a stable position when held by the handle, in which position the handle is securely urged against the dead end of the slot. Also the handle may be positioned and/or dimensioned for engagement of a lifting strap instead of being engaged directly by hand. Combining a plurality of handles with a lifting strap coupled between these handles results in a distribution of lifting loads over the handles. Preferably the handle is of such a stiffness that mounting of the handle does not require deformation of the handle. Thus, the risk that during lifting of the container, the handle bends to an extent that could result in disengagement of the handle is reduced.

**[0031]** Several features have been described as part of the same or separate embodiments. However, it will be appreciated that the scope of the invention also includes embodiments having combinations of all or some of these features other than the specific combinations of features embodied in the examples.

## Claims

1. A container having a container body (2; 52; 102; 152; 202) and a handle (3; 153; 203) mounted thereto,
   the container body (2; 52; 102; 152; 202) having a container wall (4) bounding a storage space, an opening (5) communicating with the storage space at an upper end of the container body (2; 52; 102; 152; 202) and a bottom (6) at a lower end of the container body (2; 52; 102; 152; 202), the container wall (4) extending between said opening (5) and said bottom (6) and having an outer surface and mutually opposite upright container wall portions (7, 8; 157, 158) having mutually opposite outer surface portions facing each other, the container body further having:

   a first recess in the form of a slot (9; 59; 109; 159; 209) in one of said mutually opposite upright container wall portions (7; 157), said slot (9; 59; 109; 159; 209) having a dead end (11; 61; 111; 161; 211) closed in longitudinal direction of an adjacent portion (13) of said slot (9; 59; 109; 159; 209), said longitudinal direction having an upward directional component towards said dead end (11; 61; 111; 161; 211); and a second recess (10; 160; 210) in the other one of said mutually opposite container wall portions (8; 158);

   wherein the handle (3; 153; 203) has opposite end portions (15, 16; 215, 216, one of said end portions (15, 216) being lodged in the slot (9; 59; 109; 159; 209) adjacent to said dead end (11; 61; 111; 161; 211), the other one of said end portions (16; 2016) being lodged in said second recess (10; 160; 210).

2. A container according to claim 1, wherein said second recess (10; 160) is in the form of a further slot in the other one of said mutually opposite upright container wall portions (8; 158), said further slot (10; 160) having a dead end (12; 162) closed in longitudinal direction of an adjacent portion (14) of said further slot (10; 160; 210), said adjacent portion (13) of said longitudinal direction having an upward directional component towards said dead end (12; 162).

3. A container according to claim 1 or claim 2, wherein said slot (9; 59; 109; 159; 209) extends from an open end that is open in longitudinal direction of an adjacent slot portion to said dead end (11; 61; 111; 161; 211).

4. A container according to any of the preceding claims, wherein said slot portion (13) adjacent to said dead end (11; 61; 111; 161; 211) of said slot (9; 59; 109; 159; 209) is oriented away from said dead end (11; 61; 111; 161; 211) in a first direction and wherein said slot (9; 59; 109; 159; 209) has a further portion extending from said slot portion (13) adjacent to said dead end (11; 61; 111; 161; 211) in a second direction deflected outwardly relative to said first direction.

5. A container according to any of the preceding claims, wherein said opposite end portions (15, 16; 215, 216) of said handle (3; 153; 203) are at substantially the same level.

6. A container according to claim 5, wherein said handle (3; 153; 203) is oriented substantially horizontally.

7. A container according to any of the preceding claims, wherein said handle (3; 153; 203) is an essentially straight bar.

8. A container according to any of the preceding claims, further comprising a barrier (68; 118) near said dead end (61; 111) for retaining said end portion of said handle adjacent to said dead end (61; 111) of said slot (59; 109).

9. A container according to claim 8, wherein said barrier (118) is in the form of a step in said slot (109) from a handle holding slot portion (120) adjacent to said

dead end (111) to an assembling portion (121) of said slot (109) adjacent to said handle holding portion (120), said handle holding portion (120) being of a larger depth than said assembling portion (121).

**10.** A container according to claim 8 or 9, wherein said barrier is in the form of a constriction (69) of said slot (59) between a handle holding slot portion (70) adjacent to said dead end (61) and an assembling portion (71) of said slot (59) adjacent to said handle holding portion (70).

Fig. 1

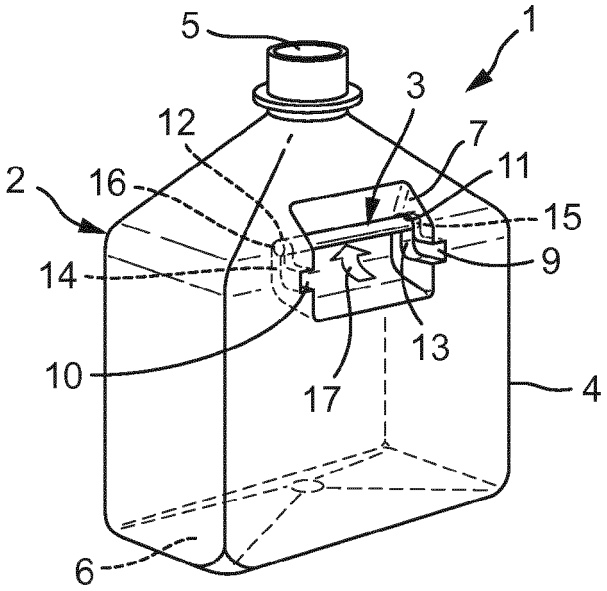


Fig. 2

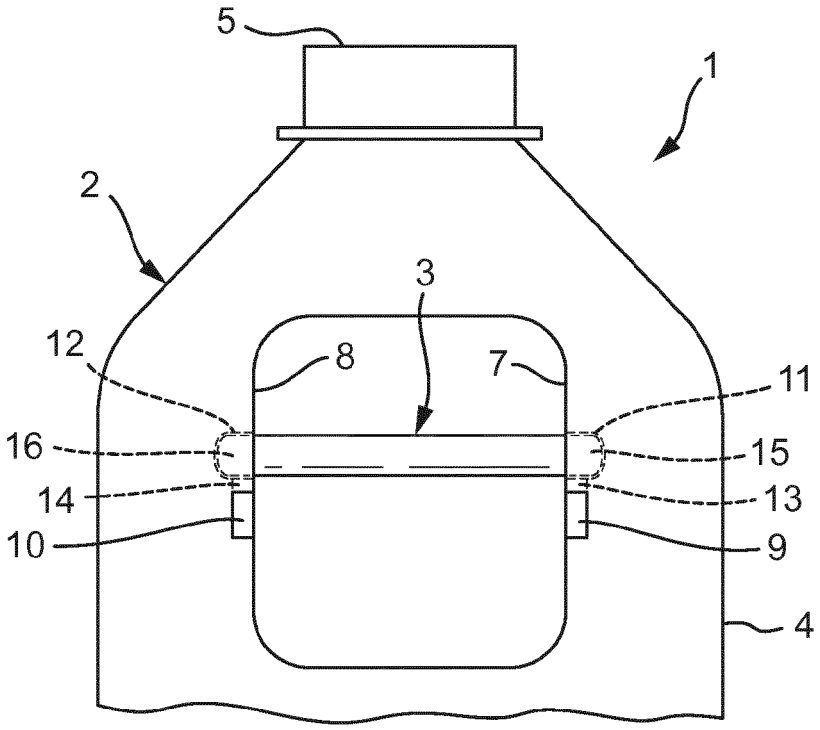

Fig. 3

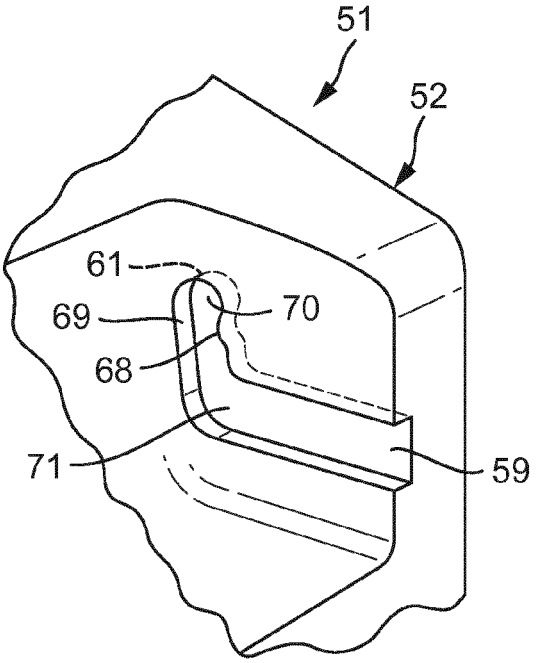


Fig. 4

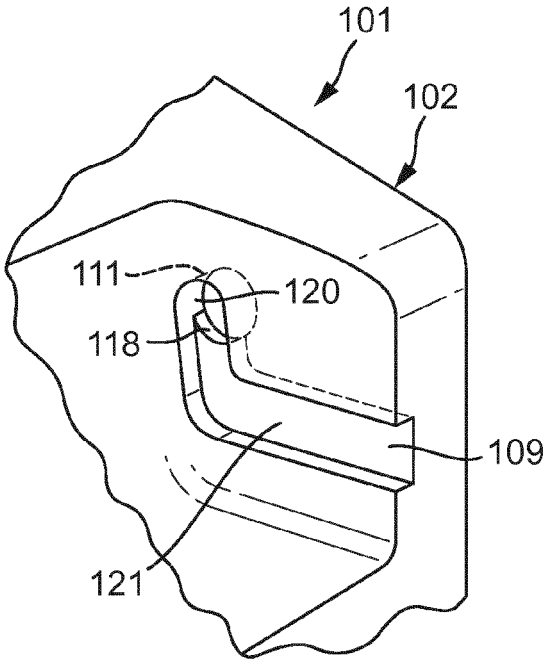


Fig. 5

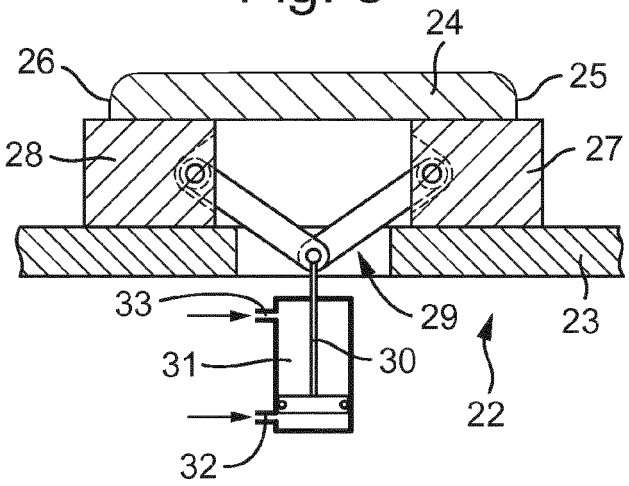


Fig. 6

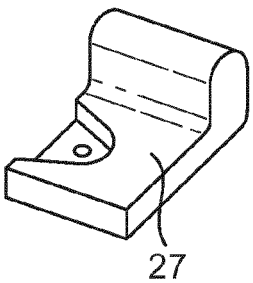

Fig. 7

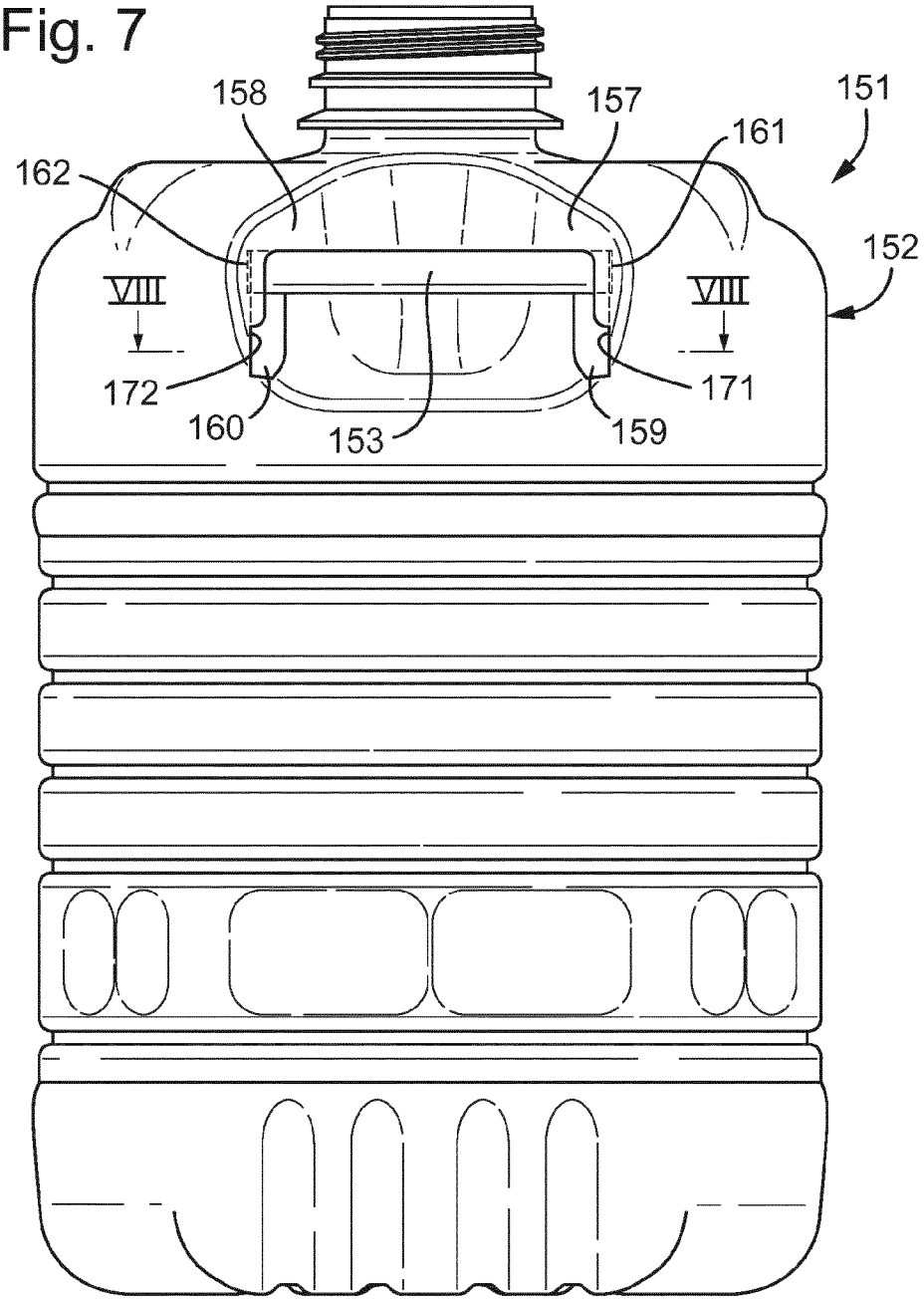
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Fig. 8

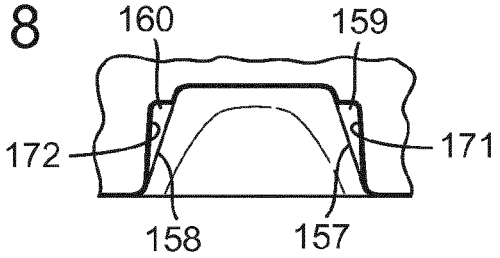
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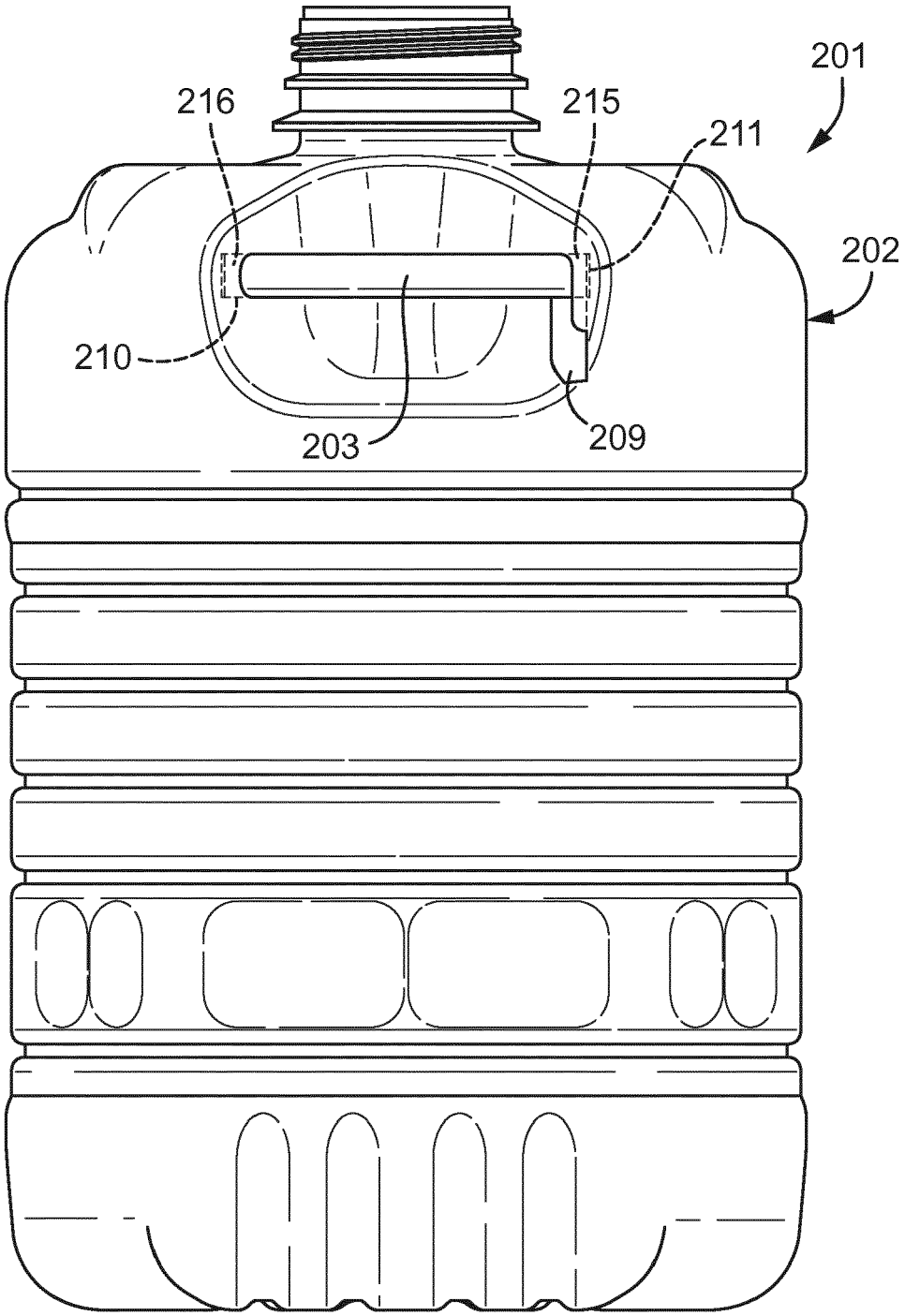
Fig. 9



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# EUROPEAN SEARCH REPORT

Application Number
EP 15 18 1825

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| A | US 2004/074913 A1 (MCDADE CLINTON [US] ET AL) 22 April 2004 (2004-04-22)<br>* figures 1-4, 9-12 * | 1 | INV.<br>B65D23/10<br>B65D25/28 |
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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 |
|---|---|---|
| Munich | 6 October 2015 | Balz, Oliver |

CATEGORY OF CITED DOCUMENTS

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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 15 18 1825

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06-10-2015

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

## REFERENCES CITED IN THE DESCRIPTION

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