



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
09.03.2011 Bulletin 2011/10

(51) Int Cl.:
B65D 21/02 (2006.01) B65D 23/10 (2006.01)

(21) Application number: **10175850.6**

(22) Date of filing: **08.09.2010**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
BA ME RS

(72) Inventor: **Gysen, August**
9042 Gent (BE)

(74) Representative: **Van Reet, Joseph et al**
Gevers
Intellectual Property House
Holidaystraat 5
1831 Diegem (BE)

(30) Priority: **08.09.2009 BE 200900547**

(71) Applicant: **Gysen, August**
9042 Gent (BE)

(54) **Stackable bottle with handle**

(57) Set comprising at least one first and one second stackable bottle 13, 14 in which each bottle 1 has a handle 12, each bottle 1 has a base part 7 with a central base part 10 and a peripheral base part 9, wherein said central base part 10 comprises a recess 11 that is dimensioned such that the recess 11 of the first bottle surrounds a bottle cap 3 and a bottle neck 4 of the second bottle in a

stacked position in which a shoulder part 5 of the second bottle rests against the peripheral base part 9 of the first bottle, wherein said handle 12 is attached to the bottle neck 4 and comprises a gripper part 17 and wherein the recess 11 is dimensioned such that the recess 11 of the first bottle also surrounds the handle 12 attached to the second bottle in said stacked position.

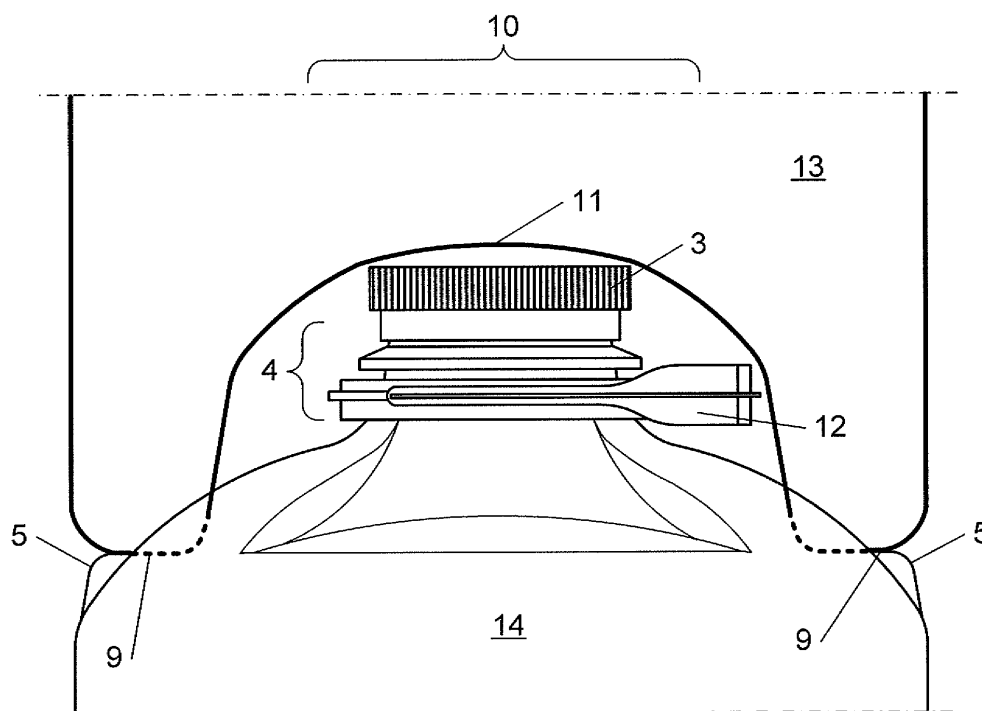


Fig. 2

Description

[0001] The invention relates to a set comprising at least one first and one second stackable bottle, wherein each bottle is made of polyethylene terephthalate and has a handle, each bottle comprises a base part which has a central base part and a peripheral base part, wherein said central base part has a recess that is dimensioned such that the recess of the first bottle surrounds a bottle top and a bottle neck of the second bottle in a stacked position wherein a shoulder part of the second bottle lies against the peripheral base part of the first bottle. The invention furthermore relates to a stackable bottle from this set.

[0002] Such bottles are known from US 5805793 and US 2007/0114200, the latter being regarded as the closest prior art. Because these known bottles have a handle, they can easily be carried. This is an advantage in particular with bottles with a capacity of greater than two litres. The fact that the bottles are stackable increases the transport possibilities. In a stacked position, a shoulder part of the bottle underneath rests against a peripheral base part of the bottle on top which results in a stable stack position.

[0003] One disadvantage of the known bottles is that the handle increases the complexity of form of the bottle, which has a disadvantageous effect on production costs. So the handle in the closest prior art is formed by a cavity in the body of the bottle, whereby the bottle has a more complex form. This more complex form of the bottle has a negative influence on the relationship between the outer dimensions and the capacity of the bottle, whereby a bottle with handle and with a first capacity has larger external dimensions than a bottle without handle with the same first capacity.

[0004] One object of the invention is to obtain a bottle with handle wherein the bottle has a less complex form without a loss of reliability of the handle.

[0005] For this a bottle according to the invention is **characterised in that** said handle is attached to the bottle neck and comprises a gripper part, and wherein the recess is dimensioned such that the recess of the first bottle also surrounds the handle attached to the second bottle in the said stacked position. Because the handle is attached to the bottle neck, there is no direct relationship between the form of the body of the bottle and the handle, as was the case in the closest prior art. As a result the form of the bottle can be determined independently of the handle, and the bottle therefore has a less complex form than the bottle from the prior art. Because the handle is attached to the bottle neck and the dimensions of the recess are also designed to surround this handle, this handle in the stacked position can also be surrounded by the recess without affecting the stackable nature of the bottle.

[0006] The bottle according to the invention is made from a material such that the bottle can be produced by blow moulding, in particular from polyethylene terephthalate.

A bottle formed via blow moulding may only deviate slightly from a linear symmetrical form around a longitudinal axis, as otherwise differences in material thickness would occur in the wall of the bottle during blow moulding. These differences are undesirable as they reduce the efficiency of material use and also create weaknesses in the bottle. Because the bottle according to the invention has a less complex form, it is easy to produce such a bottle via blow moulding.

[0007] Preferably said handle is attached to the bottle neck by means of fixing means which are annular, and on the inside of the ring there are counter-hook means such that the fixing means are intended to be pushed over the neck of the bottle from the bottle opening and offer resistance against a movement in the opposite direction. Such a fixing of the handle to the bottle is very simple and hence cheap. Furthermore pushing a ring with counter-hook means over a bottle neck is simple to automate, which is an advantage in the production process of such bottles with handle.

[0008] Preferably a first distance measured from a longitudinal axis of the bottle to the outermost periphery of the central base part amounts to maximum 80%, more preferably maximum 65%, most preferably maximum 50% of a second distance measured from said longitudinal axis to an outermost periphery of the peripheral base part. As a result the proportion of the peripheral base part is larger and the proportion of the central base part containing the recess is smaller. By making the peripheral base part larger, the contact surface with the shoulder part in the stacked position is increased. This gives a more stable stacking and the recess still remains sufficiently large to surround the handle and bottle neck and bottle cap in the stacked position.

[0009] Preferably the attached handle is freely rotatable around the bottle neck. Preferably said recess is dimensioned to surround the attached handle in any rotation position thereof in said stack position. As a result, neither when mounting the handle, nor when stacking the bottles, need the angular position of the handle in relation to the bottle be taken into account, namely the recess of the top bottle can surround a handle of the lower bottle in any angular position of the handle in relation to the bottle. This simplifies the production process of the bottles and the stacking of the bottles.

[0010] Preferably a bottle according to the invention has a capacity of more than 5 litres, preferably more than 10 litres, more preferably more than 15 litres, and a capacity of less than 35 litres, preferably less than 30 litres, more preferably less than 25 litres. Bottles with such capacity have external dimensions which make handling without handle difficult.

[0011] The invention will now be described in more detail with reference to the embodiment examples shown in the drawings.

[0012] The drawings show:

Figure 1 a side view of a stackable bottle with handle

- according to the invention,
- Figure 2 a side view of a part of a set of a first and a second stackable bottle with handle according to the invention,
- Figure 3 a first embodiment of a handle of a stackable bottle with handle according to the invention,
- Figure 4 a second embodiment of a handle of a stackable bottle with handle according to the invention,
- Figure 5 an effect of different embodiments of a handle of a stackable bottle with handle according to the invention, and
- Figure 6 a cross section of a fixing means of a handle on a stackable bottle according to the invention.

[0013] In the drawings the same or similar elements have the same reference numerals.

[0014] Figure 1 shows a bottle 1 which is produced linear symmetrical about a longitudinal axis 2. The bottle 1 from top to bottom along longitudinal axis 2 comprises an optional bottle top 3, a bottle neck 4, a shoulder part 5, a body part 6 and a base part 7. Preferably the bottle 1 is produced by means of blow moulding from a material which can be blow moulded, preferably polyethylene terephthalate (PET). An alternative material which allows the bottle 1 to be produced by means of blow moulding is polylactic acid (PLA). The bottle 1 according to the invention furthermore comprises a handle 12 attached to the bottle neck 4.

[0015] The bottle cap 3 is preferably attached to the bottle neck 4 by means of a screw connection, wherein the bottle cap 3 and bottle neck 4 have corresponding screw threads. However other systems such as click systems can also be used to attach the bottle cap 3 to the neck. The bottle neck 4 furthermore preferably comprises a collar 8 which makes it possible to grip the bottle 1 in a simple manner, in particular during blow moulding of the bottle 1.

[0016] The shoulder part 5 of the bottle 1 joins the bottle neck 4 to the body part 6 of the bottle 1. For this the shoulder part 5 extends mainly in a radial direction and downward out from the bottle neck 4 which has a first diameter, to transform into the body part 6 of the bottle 1 which has a larger diameter than said first diameter. This gives a slightly curved, mainly flat top surface at said shoulder part 5, on which a further bottle 1 can be stacked.

[0017] The base part 7 of the bottle 1 closes the body part 6 at the lower edge so that the bottle 1 is suitable for containing a fluid. The base part 7 of the stackable bottle 1 according to the invention comprises two parts, namely a peripheral base part 9 and a central base part 10. The peripheral base part 9 extends mainly radially out in relation to the longitudinal axis 2 so as to form a largely flat lower surface which can stand stable on a flat floor.

[0018] Figure 2 shows a part of a set of a first bottle

13 and a second bottle 14 in a stacked position, wherein the first bottle 13 is shown in cross section. The central base part 10 contains a recess 11 which is dimensioned such that the bottle 1 can be stacked. In a stacked position a shoulder part 5 of the bottom bottle lies against a peripheral base part 9 of a top bottle. Figure 1 shows how the bottle neck 4 and bottle cap 3 extend centrally and higher than the shoulder part 5 of the bottle 1. The handle 12 is also higher than the shoulder part 5. To make it possible, in a stacked position with a bottom bottle and a top bottle, for a peripheral base part 9 of the top bottle to lie against a shoulder part 5 of the bottom bottle, in the base of the top bottle is provided a cavity which is large enough to hold the bottle neck 4 and bottle cap 3 and handle 12 of the bottom bottle. For this in a central base part 10 a recess 11 is provided which functions as a cavity as described above. The dimensions of the recess 11 must be set such that they can surround the bottle neck 4 and bottle cap 3 and handle 12 of the bottom bottle in the stacked position.

[0019] Figure 3 shows a handle 12 of the bottle 1 with handle 12 according to the invention. According to the invention the handle 12 is attached to the bottle neck 4. For this the handle 12 preferably has annular fixing means 15 which on an inside are fitted with counter-hook means 16. The annular fixing means 15 with counter-hook means 16 allow the handle 12 to be pushed over the bottle neck 4 in the direction of the shoulder part 5 while preventing the handle 12 from being able to move over the bottle neck 4 in a direction away from the shoulder part 5. Preferably the annular fixing means 15 with counter-hook means 16 and the collar 8 on the bottle neck 4 are complementary in the sense that the counter-hook means 16 can be pushed over the collar 8 in the direction of the shoulder part 5 and prevent an opposite movement back over the collar 8. For this the counter-hook means 16 can comprise hinged lips 16 which, as shown in figure 6, in the mounted position of the handle 12 form an acute angle α with the longitudinal axis 2 towards the base part 7 of the bottle 1.

[0020] The handle 12 furthermore has a gripper part 17 which is preferably mainly U-shaped and where the two legs 18 and 19 of the U shape have a mutual distance largely equal to the outer diameter of the annular fixing means 15. The U-shaped legs 18 and 19 are both joined to the annular fixing means 15. If the legs 18 and 19 of the U shape are short, little space 20 is left between the gripper part 17 and the annular fixing means 15 to insert the fingers in space 20 and grip the gripper part 17, whereby the handle 12 is difficult to handle. However with such short legs 18 and 19, less room must be provided in the recess 11 to surround the handle 12. If the legs 18 and 19 of the U shape are long, a lot of space 20 must be left between the gripper part 17 and the annular fixing means 15 and it will be easy to grip the gripper part 17 with the fingers. However with such long legs 18 and 19 much extra space must be provided in the recess 11 to surround the handle 12, which is disadvantageous for

the stability of stacking of the bottles 1, whereby the recess 11 is best made as small as possible. For the above reasons the length of the U-shaped legs 18 and 19 of the gripper part 17 is optimally selected in the sense that they are as small as possible yet sufficiently large for fingers to easily be inserted in the space 20 between the gripper part 17 and the annular fixing means 15. Preferably the distance with reference numeral 20 between the gripper part 17 and the annular fixing means 15 is at least 2.5 cm, more preferably at least 3 cm. Preferably the distance with reference numeral 20 between the gripper part 17 and the annular fixing means 15 is maximum 4 cm, more preferably maximum 3.5 cm.

[0021] It will be clear that the gripper part 17 of the handle 12 can deviate in form from a pure U shape as is the case in figure 3. In a further embodiment as shown in figure 4, the gripper part 17 of the handle 12 is formed as an arc of a circle.

[0022] A further problem arises in lifting a full bottle 1 according to the invention with a handle 12 in which the length of the U-shaped legs 18 and 19 of the gripper part 17 is selected optimally. This problem is illustrated in figure 5. By applying an upward force F to the gripper part 17 which stands eccentric in relation to the longitudinal axis 2 of a bottle 1, the U-shaped legs 18 and 19 of the gripper part 17 will bend up in the direction of the longitudinal axis 2 as illustrated by dotted line 21. As a result the gripper part 17, or in particular the part of the gripper part 17 in which the fingers are placed for lifting, will be closer to the bottle neck 4 and the bottle cap 3. This shift of the gripper part 17 can lead to the fingers becoming trapped between the gripper part 17 and the bottle neck 4 or bottle cap 3 in this new position, as illustrated in figure 5a by distance 24. This problem can be solved by making the U-shaped legs 18 and 19 longer, whereby the gripper part 17 lies further from the annular fixing means 15 and hence also further from the bottle neck 4 and bottle cap 3, which is disadvantageous as described above. However this problem can also be solved by allowing the U-shaped legs 18 and 19 at their ends to extend into a ring part 22 (figure 3) which brings the legs 18 and 19 towards each other and has a diameter largely equal to the outer diameter of the annular fixing means 15, and by both legs 18 and 19 being attached at one end of the ring part 22 to the annular fixing means 15. As a result the distance 23 is enlarged between firstly the fixing points of the U-shaped legs 18 and 19 and the annular fixing means 15, and secondly the part of the gripper part 17 where the fingers are hooked, whereby the radius over which the legs 18 and 19 can bend under load is increased. Due to this increase in distance 23, on lifting the bottle 1 the gripper part 17 will remain further away from the bottle neck 4 and the bottle cap 3, preferably can bend over the bottle cap 3 as shown in figure 5b.

[0023] A handle 12 with circular gripper part 17 in the above solution will have the further positive effect because the legs 18 and 19 of the gripper part 17 will have a springing effect on application of force F. The circular

gripper part 17 will deform under the force F into an ellipse form whereby the distance 23 between the fixing point of the gripper part 17 and the place where the force F is applied is further enlarged and hence more space is released for the fingers.

[0024] Preferably the handle 12 in the attached position can rotate around the bottle neck 4 and the recess 11 is intended to surround the handle 12 in any rotation position. When stacking the bottles 1 on each other, no further account need be taken of the relative angular rotation of the handle 12 with the bottle 1 stacked on top. As a result the stacking of the bottles 1 is simplified. Also no means need be provided on the handle 12 and/or the bottle 1 to fix the angular position between the handle 12 and the bottle 1. This means that such a bottle 1 according to the invention can easily be moulded.

[0025] Preferably the top surface of the shoulder part 5 and the bottom surface of the peripheral base part 9 have a complementary relief with rises and dips which fit in each other and which preferably extend radially, so that after stacking, rotation of one bottle 1 in relation to the other is hindered. Preferably the rise and dip are made in the bottle 1 without varying the material thickness. As a result the bottle 1 can be produced with a rise and dip worked into the base and shoulder part 5 simply by blow moulding.

[0026] Preferably a bottle 1 according to the invention has a capacity of more than 5 litres, more preferably more than 10 litres, most preferably more than 15 litres. Preferably a bottle 1 according to the invention has a capacity of less than 35 litres, more preferably less than 30 litres, most preferably less than 25 litres.

Claims

1. Set comprising at least one first and one second stackable bottle (13, 14), wherein each bottle (1) is made of polyethylene terephthalate and has a handle (12), each bottle (1) has a base part (7) comprising a central base part (10) and a peripheral base part (9), wherein said central base part (10) comprises a recess (11) that is dimensioned such that the recess (11) of the first bottle (13) surrounds a bottle cap (3) and a bottle neck (4) of the second bottle (14) in a stacked position in which a shoulder part (5) of the second bottle (14) lies against the peripheral base part (9) of the first bottle (13), **characterised in that** said handle (12) is attached to the bottle neck (4) and comprises a gripper part (17), and wherein the recess (11) is dimensioned such that the recess (11) of the first bottle (13) also surrounds the handle (12) attached to the second bottle (14) in said stacked position.
2. Set comprising at least one first and one second stackable bottle (13, 14) according to claim 1, wherein a first distance measured from a longitudinal axis

(2) of the bottle (1) to an outermost periphery of the central base part (10) amounts to maximum 80%, preferably maximum 65%, more preferably maximum 50% of a second distance measured from said longitudinal axis (2) to an outermost periphery of the peripheral base part (9).

3. Set comprising at least one first and one second stackable bottle (13, 14) according to any of the preceding claims, wherein the fixed handle (12) is freely rotatable about the bottle neck (4). 10
4. Set comprising at least one first and one second stackable bottle (13, 14) according to claim 3, wherein said recess (11) is dimensioned to surround the attached handle (12) in any rotation position thereof in said stacked position. 15
5. Set comprising at least one first and one second stackable container (13, 14) according to any of the preceding claims, in which each container has a capacity greater than 5 litres, preferably greater than 10 litres, more preferably greater than 15 litres, and a capacity of less than 35 litres, preferably less than 30 litres, more preferably less than 25 litres. 20 25
6. Set comprising at least one first and one second stackable bottle (13, 14) according to any of the preceding claims, in which said handle (12) is attached to the bottle neck (4) by means of fixing means (15) which are annular and on the inside of the ring form are fitted with counter-hook means (16) such that the fixing means (15) are intended to be pushed from the bottle opening over the bottle neck (4) of the bottle (1) and offer resistance to the opposite movement. 30 35
7. Set comprising at least one first and one second stackable container according to claim 6, wherein said gripper part (17) is connected with said fixing means (15) such that between the gripper part (17) and the fixing means (15) is provided an opening (20) in which fingers can engage. 40
8. Set comprising at least one first and one second stackable container according to claim 6 or 7, in which said gripper part (17) comprises two legs (18, 19) which are each connected at one end with the fixing means (15) such that the distance measured between the longitudinal axis (2) and the point furthest removed from this longitudinal axis (2) on said gripper (17) is shorter than the distance measured between said end of one leg and said point furthest removed from the longitudinal axis (2) on said gripper part (17). 45 50 55
9. Set comprising at least one first and one second stackable container according to any of the preceding

ing claims, in which said gripper part (17) is largely circular.

10. Stackable bottle (1) with handle (12) from a set according to any of the preceding claims.

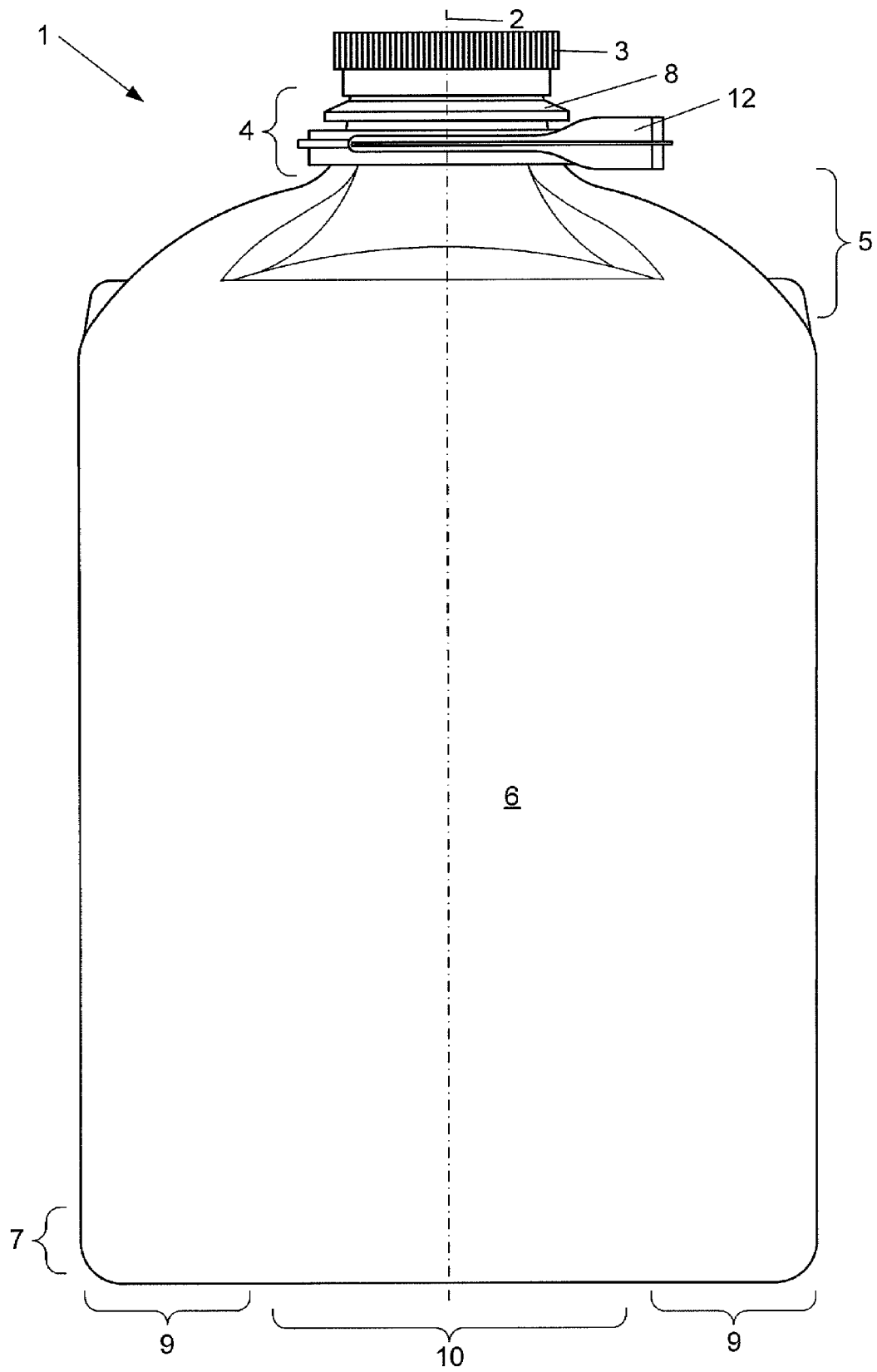


Fig. 1

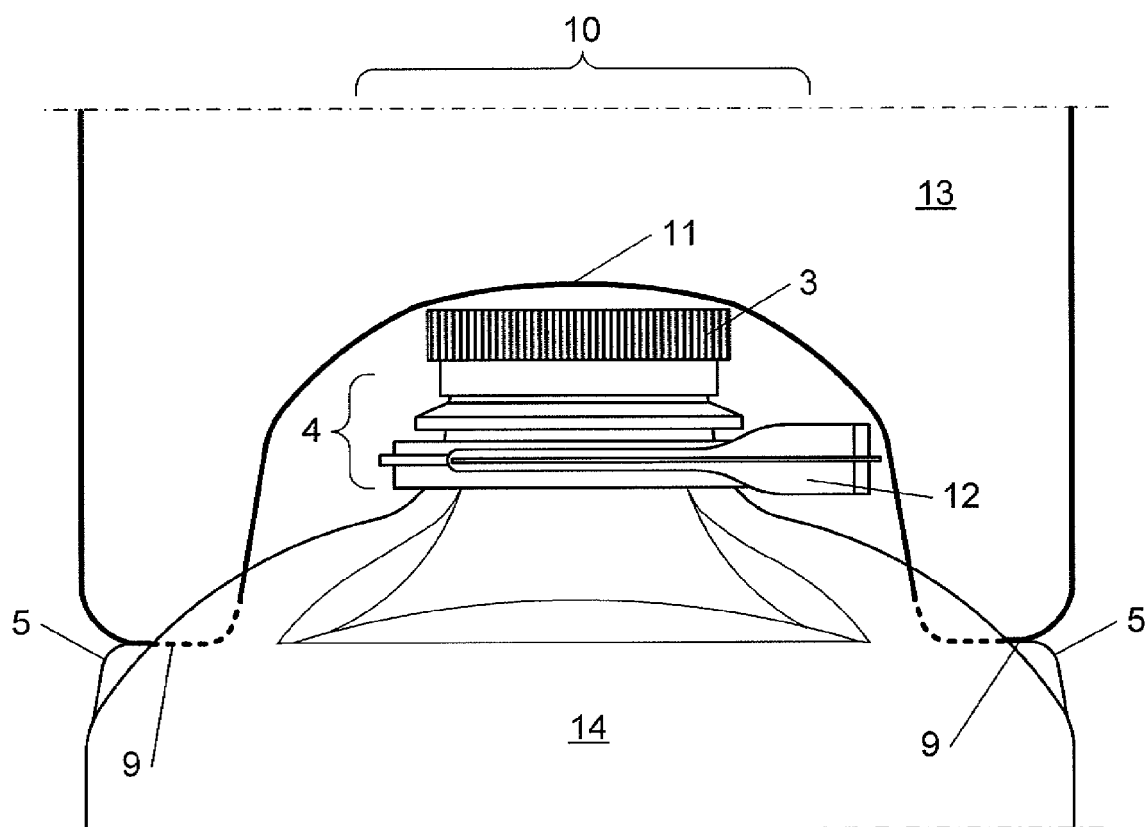


Fig. 2

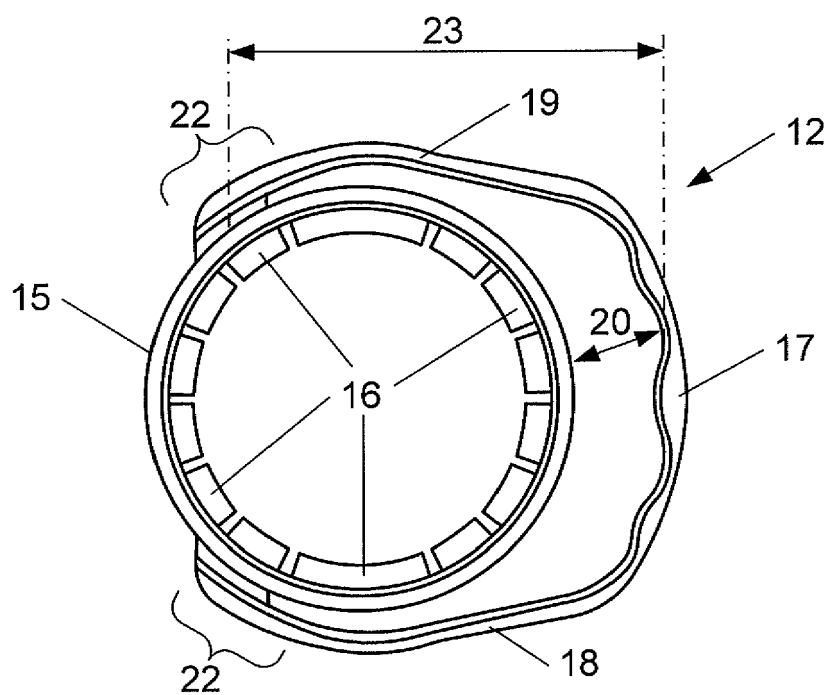


Fig. 3

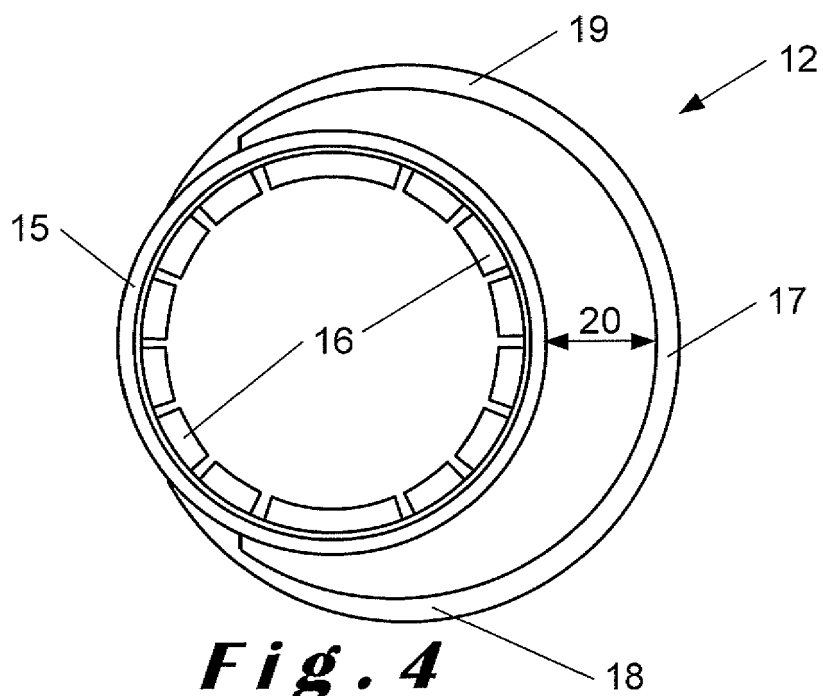


Fig. 4

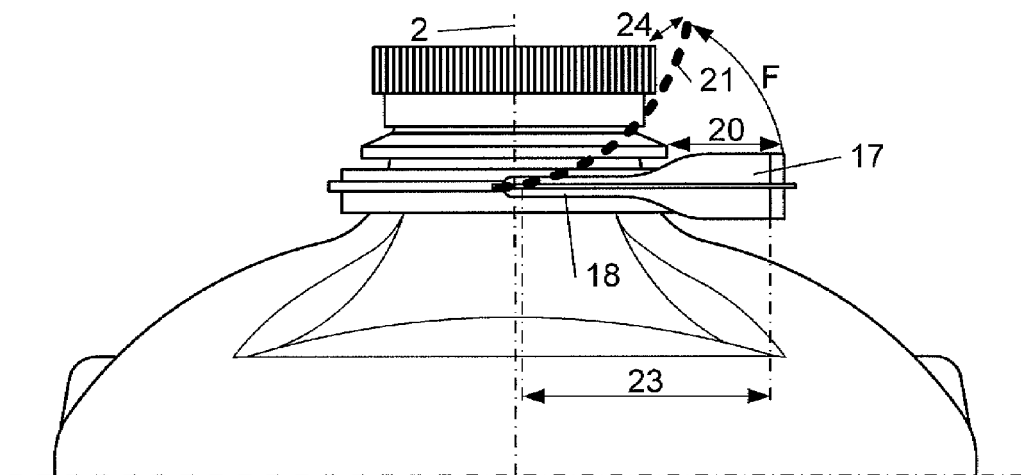


Fig. 5a

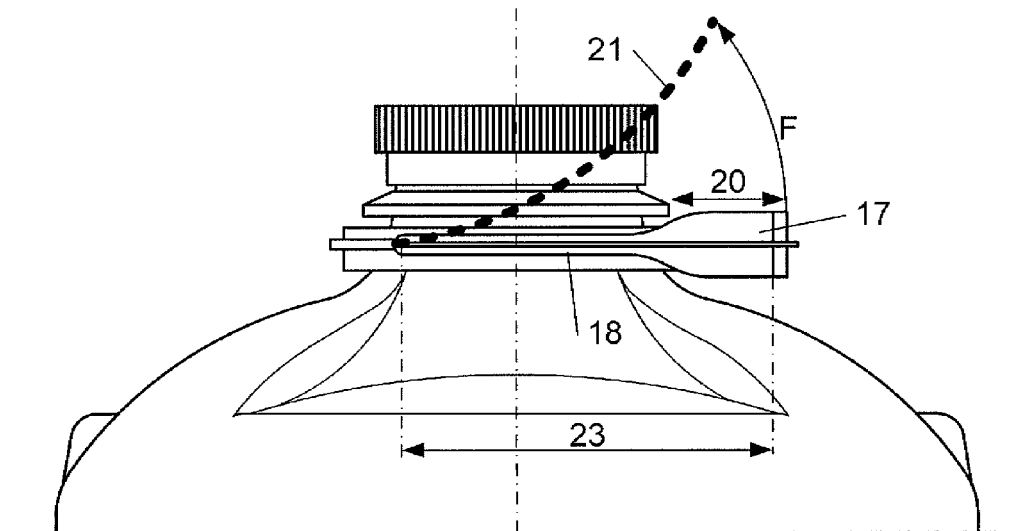


Fig. 5b

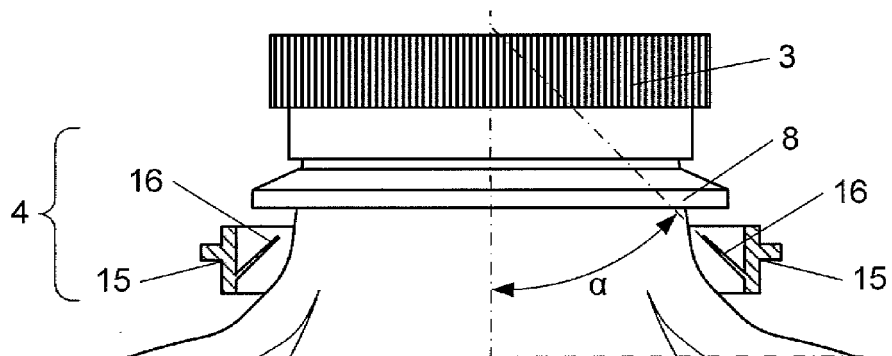


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 10 17 5850

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,D	US 2007/114200 A1 (LANE DEAN V [CA]) 24 May 2007 (2007-05-24) * paragraph [0032]; figure 4 *	1,10	INV. B65D21/02 B65D23/10
A	US 3 387 749 A (GODSHALK ALVA J ET AL) 11 June 1968 (1968-06-11) * column 3, line 73 - column 4, line 22; figures 1,3,4 *	1,10	
A	US 6 394 517 B1 (BORG JAMES C [US]) 28 May 2002 (2002-05-28) * claims 1,2; figure 1 *	3,6-8	
A	US 4 090 729 A (ERICKSON GERALD) 23 May 1978 (1978-05-23) * figure 1 *	9	
A,P	NL 2 001 397 C2 (PVG INTERNAT B V [NL]) 22 September 2009 (2009-09-22) * the whole document *	1-8,10	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
Place of search		Date of completion of the search	Examiner
The Hague		13 December 2010	Greutzius, Wim
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 17 5850

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-12-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007114200 A1	24-05-2007	NONE	
US 3387749 A	11-06-1968	NONE	
US 6394517 B1	28-05-2002	NONE	
US 4090729 A	23-05-1978	NONE	
NL 2001397 C2	22-09-2009	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 5805793 A [0002]
- US 20070114200 A [0002]