

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 305 224 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
25.10.2006 Bulletin 2006/43

(21) Application number: **01936035.3**

(22) Date of filing: **08.05.2001**

(51) Int Cl.:
B65D 30/16 ^(2006.01) **B65D 33/38** ^(2006.01)

(86) International application number:
PCT/DK2001/000319

(87) International publication number:
WO 2001/085560 (15.11.2001 Gazette 2001/46)

(54) **STAND-UP BAG OF A HEAT-SEALABLE PLASTIC FILM FOR FLOWABLE PRODUCTS**

STANDBEUTEL AUS HEISSSIEGELBARER PLASTIKFOLIE FÜR FLIESSFÄHIGE MATERIALIEN

SAC SUR PIED FABRIQUE A PARTIR D'UN FILM PLASTIQUE SCELLABLE A CHAUD POUR
PRODUITS LIQUIDES

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**

(30) Priority: **08.05.2000 DK 200000757**

(43) Date of publication of application:
02.05.2003 Bulletin 2003/18

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EP 1 305 224 B1

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Description

Technical Field

[0001] The invention relates to a stand-up bag of a heat-sealable plastic film for flowable products, said bag comprising:

a first and a second opposing side wall interconnected along two side seams,

a bottom wall folded inwards into V-shape and having with two bottom wall panels connected to the first and the second side wall, respectively, along transverse bottom connections and along bottom side seams,

a top wall folded inwards into V-shape and having with a first top wall panel connected to the first side wall and a second top wall panel connected to the second side wall along top side seams, the first top wall panel further being connected to the first side wall along a transverse top connection, and the second top wall panel and the second side wall further extending beyond the transverse upper connection and sealed to each other to form a discharge spout having a discharge passage closed by a removable end portion and sideways defined by spout side seams.

[0002] DB published specification No. A1 39 25 981 and EP patent No 0 052 151 both disclose a stand-up bag of the above type provided with a comparatively large or wide discharge spout.

[0003] Further EP-AI-0052151 discloses a bag of the above type provided with a comparatively wide spout through which the bag is filled. After filling of the bag, the spout opening is sealed, whereby the bag is closed.

Brief Description of the Invention

[0004] The object of the invention is to provide a stand-up bag of the above type provided with a discharge spout suitable for drinking out of the bag.

[0005] The stand-up bag according to the invention is characterised in that one of the side seams has an unsealed portion between the V-fold of the bottom wall and the V-fold of the top wall so as to provide an opening, into which a filling pipe can be inserted for filling the bag, and in that after removal of the removable end portion the discharge spout has an outer width of less than or equal to 50 mm at least in the spout discharge portion provided by removing the removable end portion. As a result the bag is completely ready-made with the exception of the said unsealed portion of one side seam, when the bag is filled with the liquid product to be packed therein. Especially, the discharge spout with the discharge passage and the removable end portion have been

formed before the liquid product is filled into the bag. After filling of the bag only the side walls in the unsealed portion of said one side seams need be sealed. Further after removal of the removable end portion the outer discharge portion of the discharge spout may be inserted into a person's mouth or between a person's lips, whereby the discharge spout serves as a drinking spout. Furthermore the narrow width of the spout and thus of the discharge passage allows a user to easily control the discharge of the contents of the bag, eg if the contents or a portion thereof has to be transferred to another container and the bag is turned and pressure is applied thereto.

[0006] As every person has an individual mouth size and some people find it uncomfortable to insert large objects into their mouths, according to the invention the outer width of the discharge spout may be less than or equal to 40 mm, preferably less than or equal to 30 mm, and most preferably less than or equal to 25 mm, at least in the spout discharge portion provided by removing the removable end portion. Decreasing discharge spout sizes make drinking out of the spout more pleasant for an increasing number of persons, including children.

[0007] Moreover according to the invention the interior distance between the spout side seams may be less than or equal to 30 mm, preferably less than or equal to 20 mm and most preferably less than or equal to 15 mm, at least in the area defining the effective flow area of the discharge passage.

[0008] Naturally, the effective flow area of the passage is chosen in consideration of the desired flow velocity and the viscosity of the liquid product contained in the bag. In connection with the liquids having a viscosity corresponding to that of water, it may for instance be advantageous to use an effective passage width of 6 to 10 mm to obtain a flow velocity and a volume flow rate perceived as pleasant by the individual drinking out of the bag.

[0009] Furthermore according to the invention the width of the discharge passage may be such that the parts of the second top wall panel and the second side wall, respectively, forming the spout abut each other for closing the passage so as to prevent a liquid contained in the container and having a viscosity corresponding to the viscosity of water substantially from flowing out through the spout when the bag rests on the second side wall subsequent to the removal of the removable end portion. As a result user convenience is obtained in that the contents of the bag do not flow out, if the bag falls over or a user inadvertently places the bag on the second side wall after opening of the bag.

[0010] Moreover according to the invention the discharge passage has such a width that in order to make the liquid contained in the container flow out through the discharge passage, a certain amount of pressure has to be applied to the liquid product in the bag by squeezing the bag. The risk of unintended discharge of the liquid contained in the bag is thus minimized.

[0011] Moreover according to the invention the spout side seams may extend substantially parallel to each other

er so as to provide a discharge passage having the same flow area over its entire length.

[0012] According to yet another embodiment of the invention the spout side seams may, however, also extend in a substantially converging manner when seen in outward direction, whereby the effective flow area of the discharge passage is positioned at the discharge end of the spout. This embodiment of the invention is considered particularly advantageous in connection with more viscous or paste-like liquids such as sour dairy product, mayonnaise, ketchup and mustard, where a controlled discharge is desired.

[0013] According to a further embodiment of the invention the spout side seams may, however, also extend in a substantially diverging manner when seen in outward direction, whereby the smallest and effective flow area determines the volume flow rate through the passage, when the bag is squeezed. Conversely the outer end of the passage having a larger flow area determines the discharge velocity. The embodiment is thus considered particularly advantageous in cases, where the user is to drink directly out of the spout, the desired combination of volume flow rate and discharge velocity thereby being obtained, when the bag is squeezed.

[0014] Moreover according to the invention the bag may have an interior volume less than or equal to one litre, but may also have an interior volume less than or equal to 0.5 litres or less than or equal to 0.25 litres.

[0015] Furthermore according to the invention a weakened portion in form of an incision and/or a laser perforation may be provided between the removable and portion and the discharge spout to obtain a defined removal of the removable end portion.

[0016] For the manufacture of the bag and/or the prefabricated bag according to the invention one or more flexible films are used and which - when seen in relation to the interior of the bag - has/have at least one inner heat-sealable surface, preferably comprising a polyolefin, ie PE or PP. Preferably, a softer or more flexible, eg thicker, film is used for the top and bottom walls than for the side walls to obtain the intended standing properties. Furthermore multi-layer films are preferably used comprising an inner heat-sealable surface layer. For the manufacture of the bag the laminate COEX OPP/PETP (polyester) may for instance be used, in which the PE layer is on inner side seen in relation to the finished or prefabricated bag and COEX OPP denotes a co-extruded oriented polypropylene film on either side provided with a thin sealing medium layer comprising a copolymer of PP and PE. In order to obtain enhanced barrier properties a barrier layer, eg a metallisation layer or an aluminium film, maybe provided between the PBTP layer and the PE layer or between the COBX OPP film and the PBTP layer. Furthermore the PETP layer may be replaced by an oriented polyamide, OPA.

Brief Description of the Drawings

[0017] The invention is explained in greater detail below with reference to the accompanying drawings, in which

fig. 1 is an isometric view of a stand-up bag according to the invention,

Fig. 2 illustrates a collapsed stand-up bag according to the invention seen in a side view in the direction II in Fig. 1,

Fig. 3 is a sectional view along the line III-III in Fig. 2,

Fig. 4 is a side view corresponding to that in Fig. 2 of a bag according to the invention comprising a first alternative embodiment of the discharge spout, and

Fig. 5 is a side view corresponding to that in Fig. 2 of a bag according to the invention comprising a second alternative embodiment of the discharge spout.

Best Mode for Carrying Out the Invention

[0018] The stand-up bag shown in Figs. 1 to 3 comprises a first side wall 1 and a second side wall 2 arranged opposite each other and a top wall 3 and a bottom wall 4 also arranged opposite each other. The side walls 1,2 are sealed together by means of side sealing seams 5,6 extending along two opposed side edges. The bottom wall 4 is folded inwards along a bottom wall fold 13 and sealed to the side walls 1,2 along two opposed transverse bottom seams 7, 8. The bottom wall panels 4a, 4b are sealed together and also sealed to the side walls 1,2 along the bottom side seams 9,10 aligned with the side seams 5,6.

[0019] In a corresponding manner the top wall is folded inwards into V-shape along a top wall fold 14 and thus comprises a first top wall panel 3a and a second top wall panel 3b. The two top wall panels 3a, 3b are sealed together and sealed to the first side wall and the second side wall, respectively, along top side seams 15,16 aligned with the side seams 5,6. The first top wall panel 3a is sealed to the first side wall 1 along a transverse top sealing 11. The second top wall panel 3b and the second side wall 2 are sealed together along transverse aligned top seam portions 12a, 12b, an unsealed central area being provided therebetween. The second top wall panel 3b and the second side wall 2 both extend beyond the upper transverse top seam portions 12a, 12b, which are flush with the upper transverse top seam 11. The extension 17 of the second top wall panel 3b and the extension 18 of the second side wall 2 are sealed together to form a discharge spout 19 having a discharge passage 20. The discharge passage 20 is sideways defined by the spout side seams 21,22 connected to the respective upper transverse top seam portion. 12a and 12b. The dis-

charge passage 20 is closed by means of a sealing seam 23 interconnecting the spout side seams 21, 22 in an outer removable end portion 24 providing the passage with a discharge opening 25 when removed. In the embodiment shown in figs. 1-3, the discharge spout 19 is provided with an incision 26 for easy and well-defined removal of the removable end portion 24.

[0020] In order for the discharge spout 19 to serve as a drinking spout after the removable discharge portion 24 has been removed, the spout has an outer width B in the discharge portion 27 under the incision 26 preferably of less than 30 mm and a projecting length L preferably exceeding 10 mm. The shape and size of the removable end portion 24 may be altered in any way, as it has no influence on the function of the discharge spout 19 as a drinking spout.

[0021] In the embodiment shown in Figs. 1-3 the spout side seams 21, 22 extend substantially parallel such that the discharge passage 20 has a substantially constant effective flow area. The chosen effective flow area preferably corresponds to an effective passage width b preferably less than or equal to 15 mm, most preferably less than or equal to 10 mm, a suitable combination of the volume flow rate through the passage and the discharge velocity from the passage being obtained thereby. At a suitably small effective passage width, a self-sealing passage is obtained in the sense that the wall portions of the passage abut each other substantially so as to prevent liquid having a viscosity corresponding to that of water from flowing out of the passage, when pressure is not applied to the liquid contained in the bag by squeezing the latter when it horizontally positioned.

[0022] Figs. 1 and 2 further illustrate a prefabricated bag according to the invention for the manufacture of the bag. The prefabricated bag is identical to the shown bag with the exception that the side seam 6 has a unsealed area 30 between the bottom wall fold 13 of the bottom wall 4 and the top wall fold 14 of the top wall 3, said area 30 being between the lines 31 and 32. In fig. 1 the unsealed area is further illustrated by means of dotted lines between the lines 31 and 32. The unsealed area 30 of the side seam 6 between the side walls 1 and 2 forms an opening 33 into the interior of the bag. A filling tube for filling the prefabricated bag may be inserted through the opening 33. Subsequent to filling of the prefabricated bag the filling opening 33 is closed by sealing the side walls 2 together in the unsealed area 30 of the side seam 6.

[0023] As shown in Figs. 1 and 2, the bag may further be provided with oblique bottom side seams 34,35,36,37 extending from a level of the side seams 5,6 corresponding to the bottom wall fold 13 and between a side seam 5,6 and a transverse bottom seam 7,8. Each of the oblique seams 34-37 connects a bottom wall panel 4a,4b to the adjacent side wall 1,2. The provision of the oblique bottom side seams 34-37 makes it possible to cut away the corner portions of the side walls 1,2 and corner portions of the bottom wall 4, said corner portions of the side

walls being positioned outside of these oblique seams. Naturally, the top wall 3 may be connected to the side walls 1,2 by means of corresponding oblique top side seams.

[0024] Referring now to Fig. 4, in which a bag is diagrammatically shown comprising a discharge spout 39 having spout side seams 41,42 extending from the top seams portions 32a,32b so as to define a discharge passage 40 converging when seen in outward direction. The effective sectional area of flow of the discharge passage is thus determined by the inner width b of the passage 40 at the discharge opening 45 provided when the removable end portion 44 has been torn off along the tear line defined by the tear incision 46.

[0025] Advantageously, the width and the projecting length of the discharge spout 39 correspond to the width and length of the above discharge spout 19.

[0026] Fig. 5 is a diagrammatic view of a bag according to the invention, said bag comprising a discharge spout 59 with spout side seams 61,62 extending such from the upper top seam portions 52a,52b so as to define a discharge passage 60 substantially diverging when seen in outward direction. The smallest width b or the effective flow area of the discharge passage 60 is thus spaced apart from the discharge opening 65 formed by tearing off the removable end portion 64 along the tear line defined by the tear incision 66. The width b of the discharge passage 60 may for instance be between 6-10 mm and the width of the passage in the discharge opening 65 may for instance be 15 mm.

[0027] The outer width and the projecting length of the discharge spout 59 is advantageously as described above with reference to the discharge spout 19.

Claims

1. A stand-up bag of a heat-sealable plastic film for flowable products, said bag comprising:

a first and a second opposing side wall (1,2) being interconnected along two side seams (5,6), a bottom wall (4) folded inwards into V-shape and having with two bottom wall panels (4a,4b) connected, to the first and the second side wall, respectively, along transverse bottom connections (7,8) and along bottom side seams (34-36), a top wall (3) folded inwards into V-shape and having with a first top wall panel (3a) connected to the first side wall (1) and a second top wall panel (3b) connected to the second side wall (2) along top side seams (15,16), the first top wall panel (3a) further connected to the first side wall (1) along a transverse top connection (11) and the second top wall panel (3b) and the second side wall (2) further extending beyond the transverse top connection (11) and sealed together to form a discharge spout (19;39;59) having a

discharge passage (20;40;60) closed by the means of a removable end portion (24, 44, 64) and sideways defined by spout side seams (21, 22; 41, 42; 61, 62),

characterised in that one of the side seams (6) has an unsealed area (30) between the V-fold (13) of the bottom wall (4) and the V-fold (14) of the top wall (3) so as to provide an opening (33) in which a filling tube can be inserted for filling the prefabricated bag, and **in that** after removal of the removable end portion (24;44;64) the discharge spout (19;39;59) has an outer width (B) of less than or equal to 50 mm at least in the spout discharge portion (27) provided by removing the removable end portion.

2. A bag according to claim 1, **characterised in that** the outer width (9) of the discharge spout (19; 39; 59) is less than 40 mm, preferably less than 30 mm and most preferably less than 25 mm, at least in the spout discharge portion provided by removing the removable portion.

3. A bag according to claim 1 or 2, **characterised in that** the interior distance (b) between the spout side seams (21, 22; 41, 42; 61, 62) is less than or equal to 30 mm, preferably less than or equal to 20 mm and most preferably less than or equal to 15 mm, at least in area defining the effective flow area of the discharge passage (19; 39; 59).

4. A bag according to claim 3, **characterised in that** the width of the discharge passage (20;40;60) is such that the parts of the second top wall panel (3b) and the second side wall (2), respectively, forming the spout abut each other for closing the passage so as to prevent a liquid contained in the container and having a viscosity corresponding to the viscosity of water substantially from flowing out through the spout when the bag rests on the second side wall (2) after the removal of the removable end portion.

5. A bag according to claim 4, **characterised in that** the discharge passage (20;40;60) has such a width that in order to make the liquid contained in the container flow out through the discharge passage, a certain amount of pressure has to be applied on the liquid product in the bag by squeezing the bag.

6. A bag according to any of the preceding claims, **characterised in that** the spout side seams (21, 22) extend substantially parallel to each other.

7. A bag according to any of the claims 1-5, **characterised in that** the spout side seams (41, 42) extend in a substantially converging manner when seen in outward direction.

8. A bag according to any of the claims 1-5, **characterised in that** the spout side seams (61, 62) extend in a substantially diverging manner when seen in outward direction.

9. A bag according to any of the preceding claims, **characterised in that** it has an interior volume less than or equal to one litre.

Patentansprüche

1. Standbeutel aus einer heißverschweißbaren Kunststoff-Folie für fließfähige Produkte, wobei der Beutel aufweist:

eine erste und eine gegenüberliegende zweite Seitenwand 1,2), die entlang zweier Seitennähte (5,6) miteinander verbunden sind, eine untere Wand (4), die V-förmig nach innen gefaltet ist und zwei unter Wandelemente (4a, 4b) aufweist, die entlang transversaler unterer Verbindungen (7,8) und entlang unterer Seitennähte (34-36) mit der ersten bzw. zweiten Seitenwand verbunden sind, eine obere Wand (3), die V-förmig nach innen gefaltet ist und ein erstes oberes Wandelement (3a) aufweist, das mit der ersten Seitenwand (1) verbunden ist, und ein zweites oberes Wandelement (3b) aufweist, das entlang oberer Seitennähte (15,16) mit der zweiten Seitenwand (2) verbunden ist, wobei das erste obere Wandelement (3a) außerdem entlang einer transversalen oberen Verbindung (11) mit der ersten Seitenwand (1) verbunden ist und sich das zweite obere Wandelement (3b) und die zweite Seitenwand (2) außerdem über die transversale obere Verbindung (11) hinaus erstrecken und miteinander verschweißt sind, um eine Abgabetülle (19;39;59) mit einem Abgabekanal (20;40;60) zu bilden, der mittels eines abnehmbaren Endabschnitts (24,44,64) geschlossen ist und seitlich durch Tüllenseitennähte (21,22;41,42; 61,62) definiert ist,

dadurch gekennzeichnet, daß eine der Seitennähte (6) einen nicht verschweißten Bereich (30) zwischen der V-Falte (13) der unteren Wand (4) und der V-Falte (14) der oberen Wand (3) hat, um eine Öffnung (33) bereitzustellen, in welche ein Füllrohr zum Füllen des vorfabrizierten Beutels eingeführt werden kann, und dadurch, daß nach Abnahme des abnehmbaren Endabschnitts (24;44;64) die Abgabetülle (19; 39;59) zumindest in dem Tüllenabgabeabschnitt (27), der durch Abnahme des abnehmbaren Endabschnitts bereitgestellt wird, eine äußere Breite (B) von kleiner oder gleich 50 mm hat.

2. Beutel nach Anspruch 1, **dadurch gekennzeichnet, daß** die äußere Breite (B) der Abgabetülle (19; 39; 59) zumindest in dem Tüllenabgabeabschnitt, der durch Abnahme des abnehmbaren Endabschnitts bereitgestellt wird, kleiner als 40 mm, vorzugsweise kleiner als 30 mm und am stärksten bevorzugt kleiner als 25 mm ist. 5
3. Beutel nach Anspruch 1 oder 2, **dadurch gekennzeichnet, daß** der innere Abstand (b) zwischen den Tüllenseitennähten (21, 22; 41, 42; 61, 62) zumindest in dem Bereich, der den effektiven Durchflußquerschnitt des Abgabekanals (19; 39; 59) definiert, kleiner oder gleich 30 mm, vorzugsweise kleiner oder gleich 20 mm und am stärksten bevorzugt kleiner oder gleich 15 mm ist. 10 15
4. Beutel nach Anspruch 3, **dadurch gekennzeichnet, daß** die Breite des Abgabekanals (20; 40; 60) derart ist, daß die Teile des zweiten oberen Wandelements (3b) bzw. der zweiten Seitenwand (2), die die Tülle bilden, aneinander anliegen, um den Kanal zu schließen, um so ein wesentliches Ausfließen einer Flüssigkeit, die in dem Behälter enthalten ist und eine Viskosität hat, die der Viskosität von Wasser entspricht, durch die Tülle hindurch zu verhindern, wenn der Beutel im Anschluß an die Abnahme des abnehmbaren Endabschnitts auf der zweiten Seitenwand (2) liegt. 20 25 30
5. Beutel nach Anspruch 4, **dadurch gekennzeichnet, daß** der Abgabekanal (20; 40; 60) eine solche Breite hat, daß durch Zusammenpressen des Beutels ein gewisser Druck auf das flüssige Produkt im Beutel ausgeübt werden muß, um zu bewirken, daß die im Behälter enthaltene Flüssigkeit durch den Abgabekanal ausfließt. 35
6. Beutel nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, daß** sich die Tüllenseitennähte (21, 22) im wesentlichen parallel zueinander erstrecken. 40
7. Beutel nach einem der Ansprüche 1-5, **dadurch gekennzeichnet, daß** sich die Tüllenseitennähte (41, 42), in Auswärtsrichtung gesehen, im wesentlichen konvergent erstrecken. 45
8. Beutel nach einem der Ansprüche 1-5, **dadurch gekennzeichnet, daß** sich die Tüllenseitennähte (61, 62), in Auswärtsrichtung gesehen, im wesentlichen divergent erstrecken. 50
9. Beutel nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, daß** er ein Innenvolumen von kleiner oder gleich einem Liter hat. 55

Revendications

1. Sac sur pied en film plastique thermosoudable pour produits liquides, ledit sac comprenant :
 - une première et une deuxième paroi latérale en vis-à-vis (1, 2) interconnectées le long de deux jonctions latérales (5, 6),
 - une paroi de fond (4) repliée vers l'intérieur en forme de V et ayant deux panneaux de paroi de fond (4a, 4b) assemblés respectivement aux première et deuxième parois latérales le long d'assemblages de fond transversaux (7, 8) et le long de jonctions latérales de fond (34-36),
 - une paroi supérieure (3) repliée vers l'intérieur en forme de V et ayant un premier panneau de paroi supérieure (3a) assemblé à la première paroi latérale (1) et un deuxième panneau de paroi supérieure (3b) assemblé à la deuxième paroi latérale (2) le long de jonctions latérales supérieures (15, 16), le premier panneau de paroi supérieure (3a) étant en outre assemblé à la première paroi latérale (1) le long d'un assemblage supérieur transversal (11) et le deuxième panneau de paroi supérieure (3b) et la deuxième paroi latérale (2) s'étendant en outre au-delà de l'assemblage supérieur transversal (11) et étant soudés ensemble pour former une goulotte de distribution (19 ; 39 ; 59) ayant un passage de distribution (20 ; 40 ; 60) fermé au moyen d'une partie d'extrémité amovible (24, 44, 64) et défini sur ses côtés par des jonctions latérales de goulotte (21, 22 ; 41, 42 ; 61, 62),
 - caractérisé en ce que** l'une des jonctions latérales (6) comporte une région non soudée (30) entre le pli en V (13) de la paroi de fond (4) et le pli en V (14) de la paroi supérieure (3) afin de fournir une ouverture (33) dans laquelle peut être inséré un tube de remplissage pour remplir le sac préfabriqué, et **en ce que** après retrait de la partie d'extrémité amovible (24 ; 44 ; 64), la goulotte de distribution (19 ; 39 ; 59) a une largeur extérieure (B) inférieure ou égale à 50 mm au moins dans la partie distributrice de la goulotte (27) fournie en retirant la partie d'extrémité amovible.
2. Sac selon la revendication 1, **caractérisé en ce que** la largeur extérieure (B) de la goulotte de distribution (19 ; 39 ; 59) est inférieure à 40 mm, de préférence inférieure à 30 mm et mieux encore inférieure à 25 mm, au moins dans la partie distributrice de la goulotte fournie en retirant la partie amovible.
3. Sac selon la revendication 1 ou 2, **caractérisé en ce que** la distance intérieure (b) entre les jonctions latérales de goulotte (21, 22 ; 41, 42 ; 61, 62) est inférieure ou égale à 30 mm, de préférence inférieure

ou égale à 20 mm et mieux encore inférieure ou égale à 15 mm, au moins dans la région qui définit la région d'écoulement effectif du passage de distribution (19 ; 39 ; 59).

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4. Sac selon la revendication 3, **caractérisé en ce que** la largeur du passage de distribution (20 ; 40 ; 60) est telle que les parties du deuxième panneau de paroi supérieure (3b) et la deuxième paroi latérale (2), respectivement, formant la goulotte butent les unes contre les autres pour fermer le passage afin d'empêcher un liquide contenu dans le récipient et ayant une viscosité correspondant à la viscosité de l'eau substantiellement de s'écouler à l'extérieur par la goulotte lorsque le sac repose sur la deuxième paroi latérale (2) après retrait de la partie d'extrémité amovible. 10 15
5. Sac selon la revendication 4, **caractérisé en ce que** le passage de distribution (20 ; 40 ; 60) a une largeur telle que pour faire s'écouler le liquide contenu dans le récipient à l'extérieur par le passage de distribution, il faut appliquer un certain niveau de pression sur le produit liquide présent dans le sac en pressant le sac. 20 25
6. Sac selon l'une des revendications précédentes, **caractérisé en ce que** les jonctions latérales de goulotte (21, 22) s'étendent sensiblement parallèlement entre elles. 30
7. Sac selon l'une des revendications 1 à 5, **caractérisé en ce que** les jonctions latérales de goulotte (41, 42) s'étendent de manière sensiblement convergente en regardant vers l'extérieur. 35
8. Sac selon l'une des revendications 1 à 5, **caractérisé en ce que** les jonctions latérales de goulotte (61, 62) s'étendent de manière sensiblement divergente en regardant vers l'extérieur. 40
9. Sac selon l'une des revendications précédentes, **caractérisé en ce qu'il** a un volume intérieur inférieur ou égal à un litre. 45

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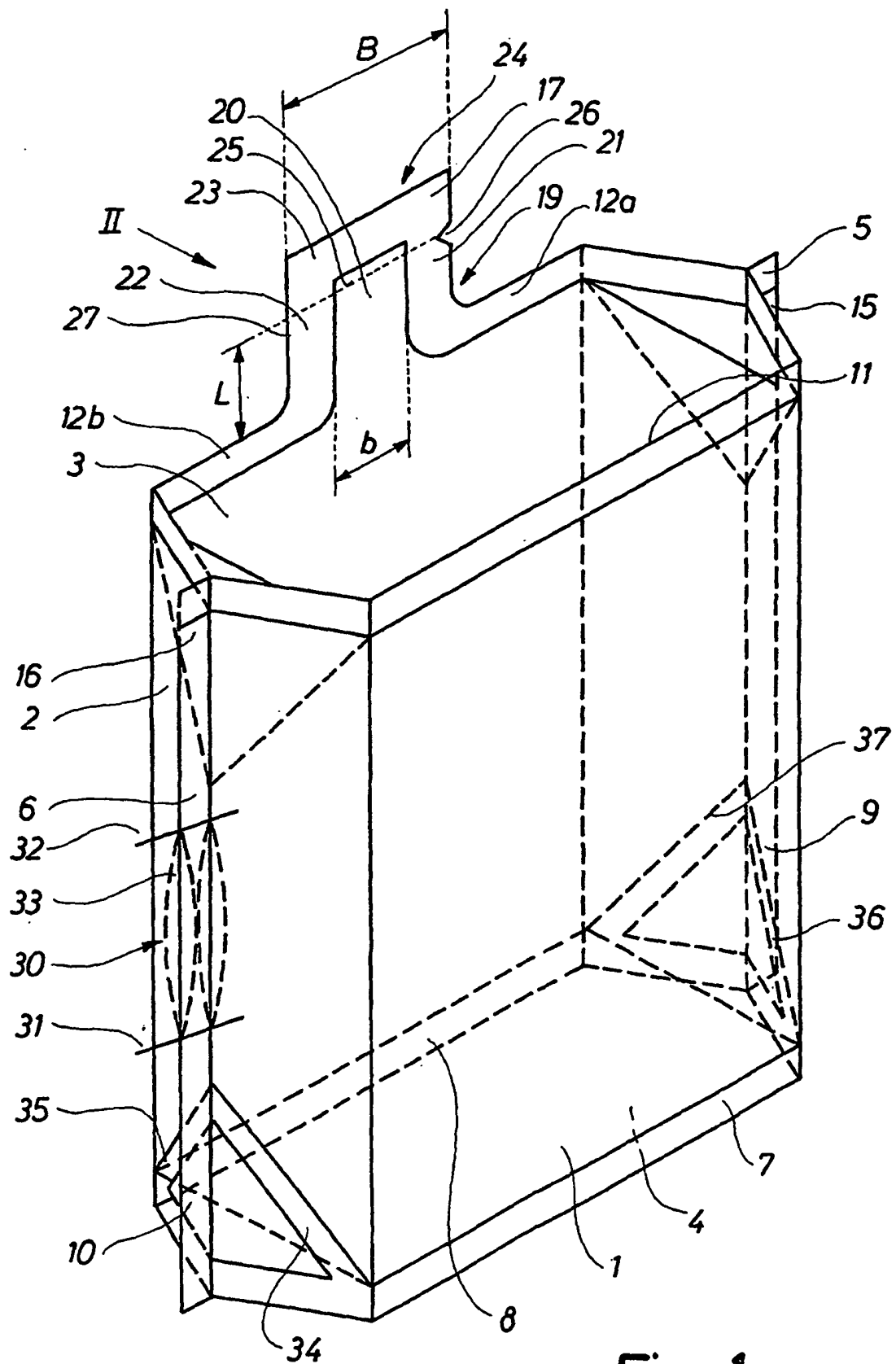


Fig. 1

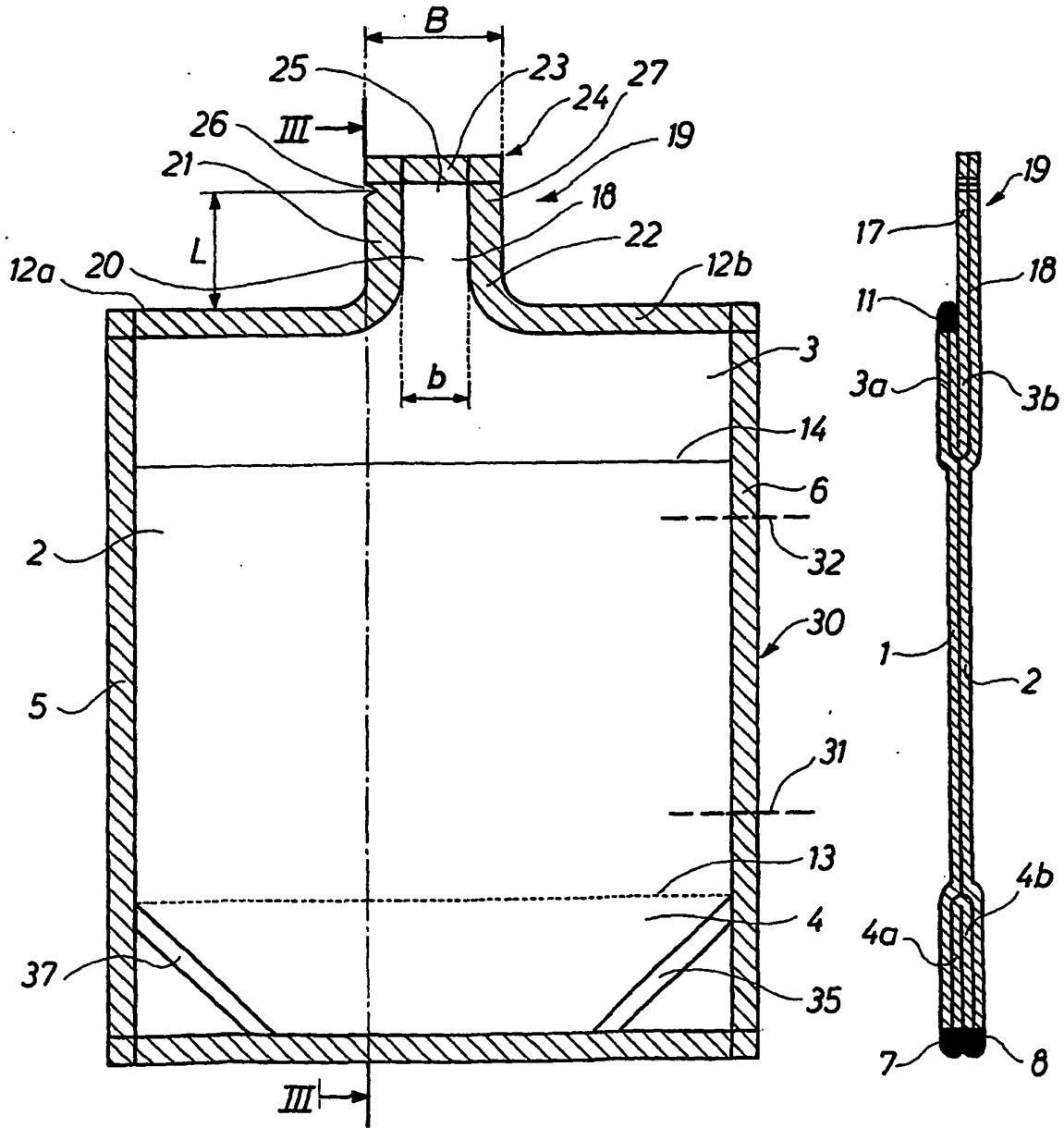


Fig. 2

Fig. 3

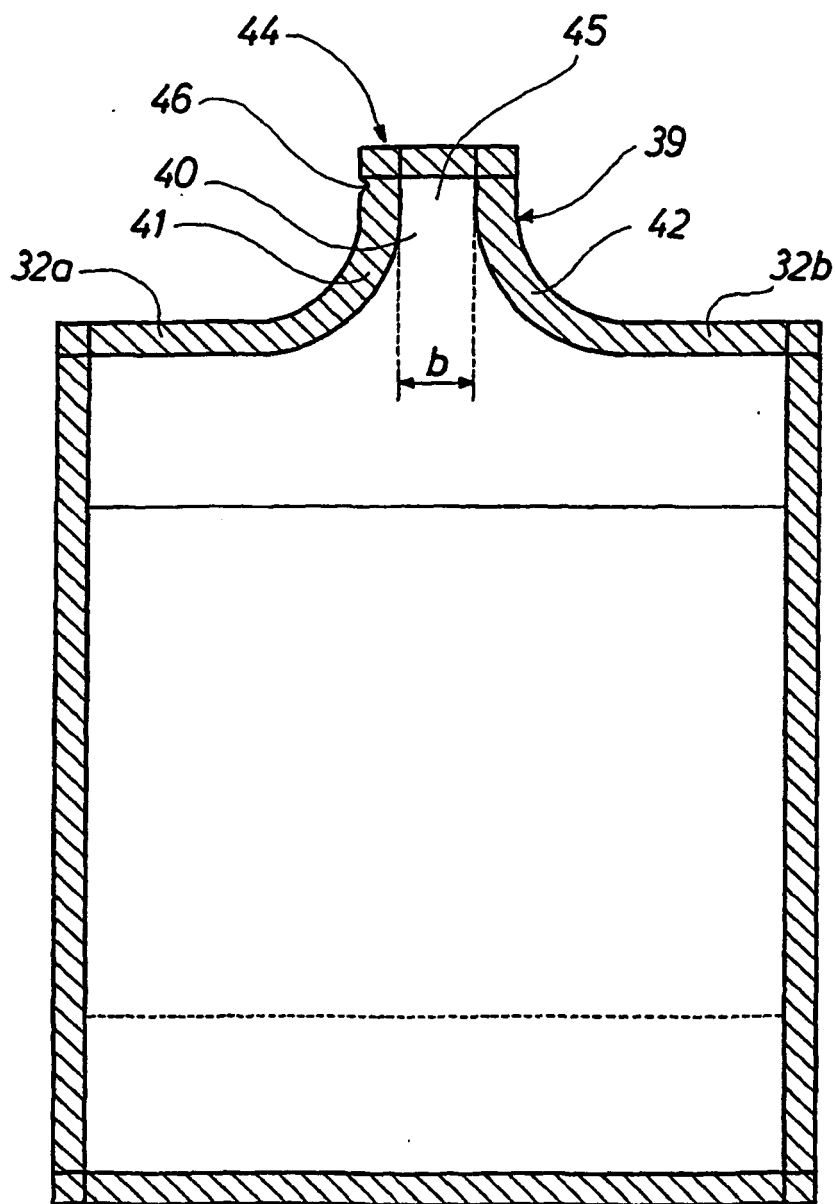


Fig. 4

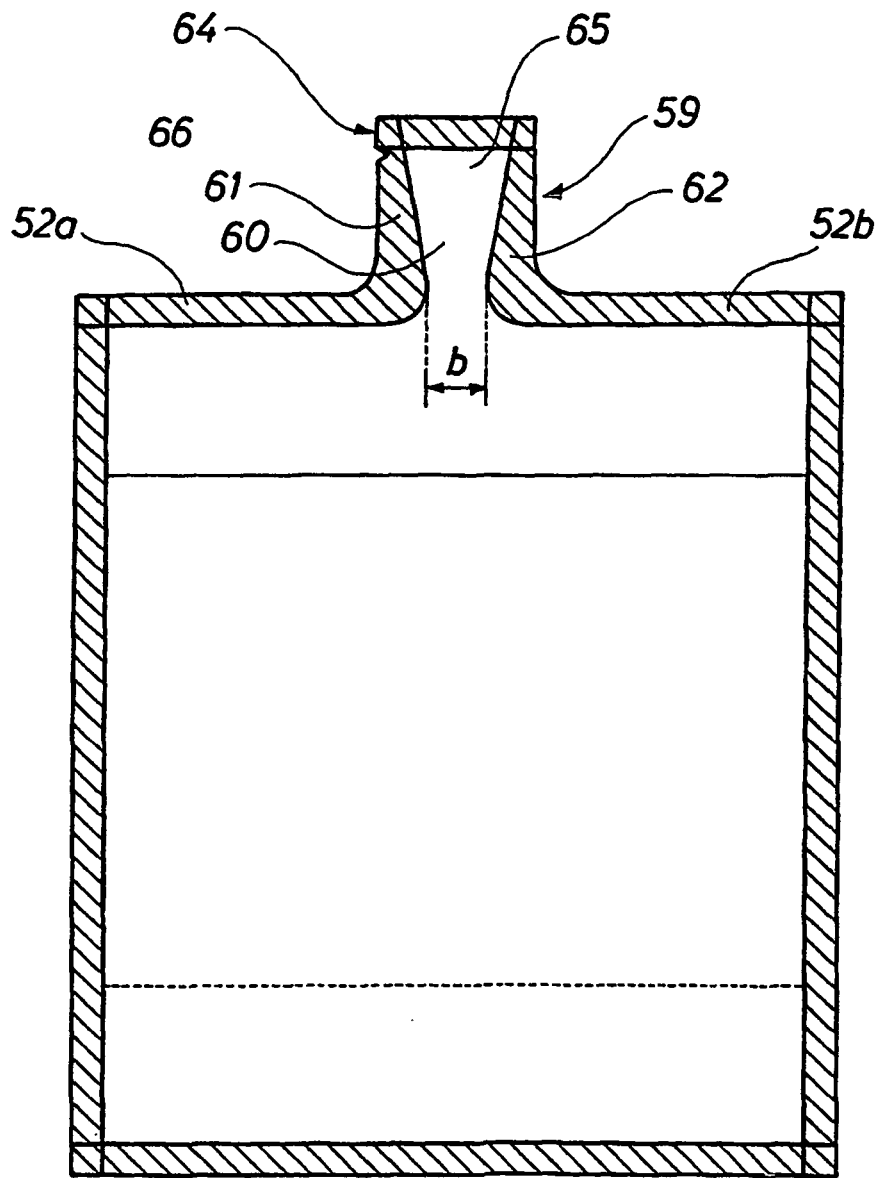


Fig. 5