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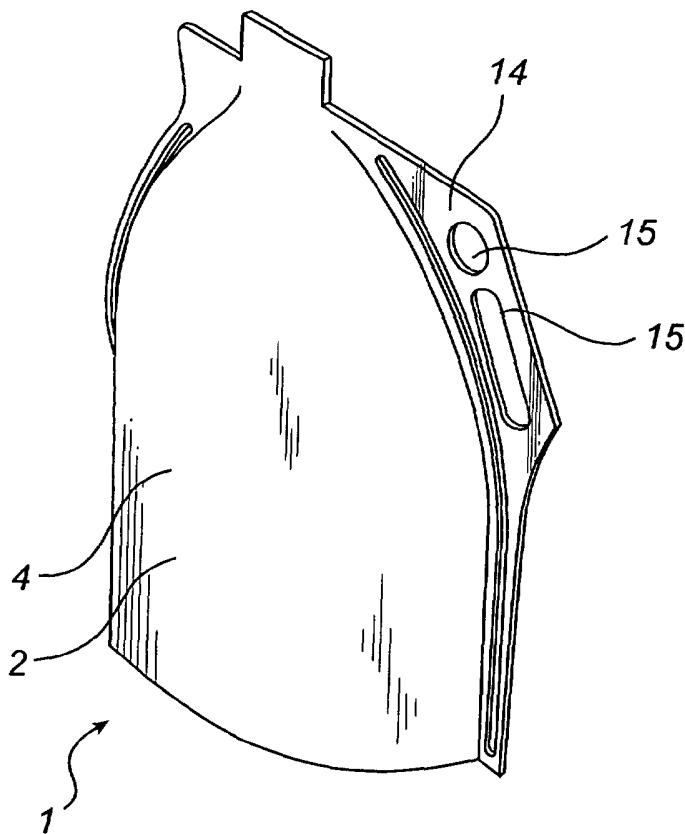
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(54) Title: CONTAINER



(57) Abstract: A container (1) comprising a compartment (4) which is defined by flexible walls and whose volume depends on the relative position of the walls, two opposite side walls (2) being joined along a common connecting portion (5). The container is characterised in that a first gasfilled duct means (11) is arranged in the connecting portion (5) along at least a first side (12) of the container (1). The invention also concerns a method of producing such a container by forming at least one gap in said side walls (2) in connection with the forming of the connecting portion (5) and, in connection with the filling of the container (1), filling each gap with gas and sealing it to form a gas-filled duct (11, 16, 18).



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SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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CONTAINER

## FIELD OF THE INVENTION

The present invention relates to a container of a collapsible type, more specifically such a container comprising a compartment which is defined by flexible walls and whose volume depends on the relative position of the walls, two opposite side walls being joined along a common connecting portion, and a method of producing the same.

## 10 BACKGROUND ART

A container of the type described by way of introduction is known from e.g. WO9941155 which discloses a container of a collapsible type comprising three wall portions, of which two form opposite side walls and a third one forms a bottom wall. The walls which are made of a plastic material are flexible and interconnected to form a compartment whose volume depends on the relative position of the walls. The container has a carrying means which is integrated with the connecting portion and comprises openings to form a handle.

In the transition between the upper and the lower portion of the container, i.e. between the lower edge of the carrying means which is slightly more stiff than the connecting portion, and the lateral connecting portion of the container there forms a zone with a locally somewhat lower stiffness, in which zone the wall portion of the container may unintentionally be upset or folded. The deformation bears great resemblance with the one occurring when a filled bag is placed on its end. Wrinkling usually arises along the lateral seams of the bag. For the type of container in question, only one deep wrinkle as a rule arises in the connecting portion, said wrinkle often spreading over part of the side wall of the container.

The deformation may take place, for instance, during long transports or by careless handling and is in most cases permanent. The wrinkle affects the shape and appearance of the container in a negative fashion and, if the worst comes to the worst, causes wear on the side walls and a notch with a risk of leakage.

In such a container, it is known to arrange a gas-filled duct in the space between the openings of the carrying means and the periphery of the carrying means for the purpose of providing a good handle. Such a duct certainly provides a good, three-dimensional handle but does not contribute to the stiffness or stability of the container. The gas-filled duct rather causes an increased risk of wrinkling.

In addition it is also known, e.g. by US 3 742 994, to improve the rigidity of a container by using a double walled structure enclosing together with the connecting portion a circumferential cavity. This cavity is intended to be filled with e.g. air by the consumer when the container is to be used. Thereby a self-supporting container in the open standing position is achieved.

#### OBJECTS OF THE INVENTION

The object of the present invention is to provide an improved container of the known type to impart to the container inherent strength that counteracts upsetting or folding of its connecting portion and side walls.

Another object of the invention is to achieve these properties without adding a further amount of material or a material of another type.

One more object of the invention is that it should be possible to make the container in existing manufacturing equipment after only minor modifications thereof.

#### DESCRIPTION OF THE INVENTION

These and other objects, which will be evident from the following description, are now achieved by a con-

tainer comprising a compartment which is defined by flexible walls and whose volume depends on the relative position of the walls, two opposite side walls being joined along a common connecting portion, characterised  
5 in that a first gas-filled duct means is arranged in the connecting portion along at least a first side of the container.

As a result, the first gas-filled duct means forms a kind of backbone in the container which gives stiffness  
10 and stability in each side of the container in which the gas-filled duct means is arranged. This counteracts the container losing shape and appearance during transport or careless handling. Moreover, the risk of notches by  
15 wrinkle-related wear is reduced. By arranging the stiffening in the form of a gas-filled duct means, no new type of material or no further amount of material is added. The inventive container can thus be introduced into existing manufacturing processes with only minor modifications of the manufacturing equipment. Furthermore, the  
20 environmental aspects of the container in the form of e.g. environmental influence, recovery or decomposition capability are not affected.

In a preferred embodiment, the first gas-filled duct means is arranged in the connecting portion also along a  
25 second side of the container opposite to the first side. As a result, the container will be stiff on two opposite sides, which prevents the problem of upsetting and wrinkling from only being moved to another area of the container.

30 In another preferred embodiment, the first gas-filled duct means comprises at least one gap which is arranged in said connecting portion and formed along said side walls and which by introducing a gaseous medium into the same forms a gas-filled duct. The gas-filled duct  
35 means is in its simplest form a duct which is formed by a gap which is filled with gas and then sealed. By arranging the first duct means in the form of a gap in the con-

necting portion, no new or additional material is added to the container. Moreover, the gap can be formed in connection with the forming of the connecting portion, and therefore modifications of existing manufacturing equipment, if any, will be limited to essentially comprising the tool which is used for the forming of the connecting portion.

Arranging the first duct means in the form of a gap further means that the container will be completely flat until the gap is filled with gas. This is advantageous in the cases where the container is made at a central location and delivered to local producers which on their own take care of filling the container. This saves space during transport and storage.

It is also preferred for the first gas-filled duct means to be continuous along its entire length. This facilitates the filling of the duct arranged in the connecting portion since filling with gas can take place from one direction and by means of one nozzle. Making the first duct means continuous along each side in combination with the arrangement thereof on both sides of the container additionally ensures that any problems with upsetting and folding are not merely moved to another area of the container.

It is also preferred for the connecting portion on the first and/or the second side of the container to comprise a carrying means, which accommodates a second gas-filled duct means.

By arranging a carrying means, the handling of the container will be significantly facilitated since the user does not have to grip the flexible side walls of the container. A second gas-filled duct means in the carrying means also implies that a handle which is easy to grasp is formed.

In another preferred embodiment, the first gas-filled duct means is continuous with the second gas-filled duct means and communicates with the same. This

means that when the carrying means is grasped, air is pressed out of the second duct means and into the first duct means, which increases the pressure and, thus, the stiffness along the side of the container in which the carrying means is arranged. Consequently, stiffness and stability of the container increase temporarily while being handled, which is most advantageous.

In another preferred embodiment, the gas-filled duct means are filled with air.

Moreover, it is preferred for the container to be made of a material containing a filler of mineral material and a binder of polyolefin material. The mineral material should consist of chalk (calcium carbonate). Such a choice of material is advantageous since the raw materials are inexpensive and the completed product is harmless to the environment and easy to recover.

#### DESCRIPTION OF THE DRAWINGS

The invention will now be described in more detail by way of example with reference to the accompanying drawings which illustrate a currently preferred embodiment.

Figs 1a and 1b are perspective views of a preferred embodiment of an inventive container in a filled, non-opened state.

Fig. 2a is a top plan view of the container shown in Figs 1a and 1b, some parts being removed to illustrate the construction of the container.

Fig. 2b is a section III-III through the container according to Fig. 2.

Figs 3a-3c show preferred embodiments of a gas-filled duct means.

#### TECHNICAL DESCRIPTION

With reference to Figs 1a and 1b, an embodiment of a container 1 according to the invention is shown in an unopened state, filled with liquid contents. The con-

tainer 1 is particularly intended for liquid food products such as milk, water, juice or wine.

The container 1 is of a collapsible type, i.e. compressible or foldable, and comprises three flexible  
5 walls, two of which constitute opposite side walls 2 and the third constitutes a bottom wall 3. The walls 2, 3 are interconnected to form a compartment 4 whose volume depends on the relative position of the walls 2, 3.

With reference to Fig. 2a, a top plan view of the  
10 container 1 shown in Figs 1a and 1b is shown with one side wall 2 removed. The walls 2, 3 included in the container 1 are interconnected along a continuous connecting portion 5 which, to facilitate the description, can be divided into partial portions as described below.

15 The two side walls 2 are along the upright sides of the container 1 interconnected along a lateral connecting portion 6. In the bottom area 7 of the container 1, the side walls 2 are also connected with the bottom wall 3 via on the one hand a bottom connecting portion 8 along  
20 which each side wall 2 is connected with the bottom wall 3 and, on the other hand, via the lower connecting portion 9 along which all three walls 2, 3 are interconnected (in a common joint). With reference to Fig. 2b, a section of the bottom area 7 of the container 1 is illustrated to show how the bottom wall 3 can be arranged  
25 relative to the side walls 2. The compartment 4 of the container 1 is thus defined by the side walls 2 and the bottom wall 3. The connecting portion 5 forms boundary lines 10 facing the compartment 4. The joining of the  
30 connecting portion 5 preferably takes place by welding.

With reference to Fig. 3a, the connecting portion 5 comprises along the sides of the container 1, i.e. the lateral connecting portion 6, a first gas-filled duct means 11. The first gas-filled duct means 11 is arranged  
35 in at least a first side 12 of the container 1, but preferably also in the second side 13 of the container 1, opposite to the first side 12. The duct means 11 is in



its simplest form a duct. The duct is arranged to follow the boundary line 10 between the compartment 4 and the connecting portion 5 and should be continuous along the entire container side in which it is arranged.

5           In a first side 12 of the container 1, a carrying means 14 is arranged in the connecting portion 5. The carrying means 14 is preferably arranged in the upper portion of the container 1 and should constitute part of the connecting portion 5.

10           The carrying means 14 should in prior art manner comprise a first, essentially round opening 15, and a second, essentially elongate opening 15. As a result, the carrying means 14 forms a handle which gives the user the possibility of lifting the container 1 using four fingers  
15 while at the same time a force-absorbing portion is formed between the openings 15 so that the handle is not wrinkled or deformed in another way. The two openings 15 have an extent which makes an angle of about 25 degrees to a vertical line through the container. Various tests  
20 have shown that an angle in the range 20-30 degrees results in good user friendliness.

          With reference to Figs 3b-3c, further embodiments of the duct means 11 are shown. Supplementing the first gas-filled duct means 11, a second gas-filled duct means 16  
25 can according to Fig. 3b be arranged in the outer part of the carrying means 14, i.e. between the openings 15 of the carrying means 14 and the circumference of the carrying means 14. The main purpose of this second duct means 16 is to form a three-dimensional, user-friendly handle.

30           It is also possible, according to Fig. 3c, to join the first duct means 11 with the second duct means 16 to form a common duct means 18. Consequently one and the same duct means can constitute both handle reinforcement and reinforcement along the first side 12 of the con-  
35 tainer 1. The latter variant is advantageous by the first side 12 of the container being temporarily reinforced when the user grasps the handle of the container 1 since

the air in the second duct means 16 is pressed into the first duct means 11. The stiffness of the container 1 thus increases temporarily while the container 1 is being handled.

5 All gas-filled duct means 11, 16, 18 arranged in the container 1 should be filled with air.

With reference to Fig. 2a, it should be pointed out that the inventive container 1, like prior art containers, may comprise an outlet means 17. The outlet means 17  
10 should be arranged at a distance from the bottom area 7 and preferably opposite the same. The outlet means 17 can be used to fill the container 1 with the intended product, after which it is sealed to be opened again by the consumer. The outlet means 17 may comprise a sealing mechanism, for instance a screw stopper.  
15

In the cases where the container 1 has an outlet means 17, at least the first duct means 11 should extend up along the same.

An outlet area 19, if any, can be arranged in the  
20 connecting portion 5 in the upper portion of the container 1, opposite to the carrying means 14. The purpose of the outlet area 19 is to form a spout through which the contents of the container 1 can be portioned. The outlet area 19 is opened by, for example, separating its  
25 outer portion.

The duct means 11, 16, 18 are preferably made by forming, in connection with the forming and joining of the connecting portion 5 and the carrying means 14, gaps  
20 in the positions where the duct means are desired.  
30 This can take place, for example, by arranging recesses, conforming with the shape of the gaps 20, in the forming/joining tool (not shown) which is used for the connecting portion 5 and the carrying means 14. The material of this recess will thus remain unaffected, and therefore  
35 gaps 20 are formed between the wall portions 2 included in the connecting portion 5 and the carrying means 14. The gaps 20 should be open or be made openable at one end

to allow, at a later stage, filling with gas. The gap opening (not shown) preferably opens in connection with the mouth of the outlet means 17. The filling with gas can take place in connection with the container 1 being filled with the intended product. After filling with gas, the gap 20 is sealed and thus forms a gas-filled duct.

By arranging the gap opening in connection with the mouth of the outlet means 17, it is possible to integrate a nozzle for filling with gas with a nozzle (not shown) for the product intended for the container.

Arranging the duct means 11, 16, 18 as gaps 20 and filling them with gas only in connection with the filling of the container means that the container 1 is completely flat until being filled. The inventive container 1 thus occupies no extra space in the cases where the container 1 is made at a central location and is then transported to local producers which carry out the actual filling with the intended product.

Forming the gaps 20 by means of recesses in the forming tool and arranging the filling of the formed gaps 20 with gas in connection with the filling operation means that a modification to existing manufacturing equipment is limited to comprise only the filling nozzle and the forming/joining tool. These two machine modules can easily and rapidly be replaced, which means that the same manufacturing equipment can be used for manufacturing both conventional and inventive containers.

The present invention thus relates to an improved variant of prior art containers 1, in which the connecting portion 5 on at least one side of the container 1 comprises a first gas-filled duct means 11 which extends along the side of the container 1. This first gas-filled duct means 11 counteracts that the container 1 is upset or folded in careless or extensive handling. As a result, the shape and appearance of the container 1 is retained while at the same time the risk of wear-related leakage is reduced.

The first gas-filled duct means 11 can be combined with a second gas-filled duct means 16 arranged in the carrying means 14. The two duct means 11, 16 can be continuous and communicate with each other.

5 Providing reinforcement by means of gas-filled ducts is advantageous since a new type of material or a further amount of material need not be added to the container 1. This saves weight as well as cost of material. The possibility of recovering the container 1 is not affected.  
10 Moreover, existing manufacturing equipment can be used with only minor modifications.

It will be appreciated that the present invention is not restricted to the shown embodiment of the inventive container. Several modifications and variants are thus  
15 feasible, and the invention is consequently defined exclusively by the appended claims.

## CLAIMS

1. A container (1) comprising a compartment (4)  
5 which is defined by flexible walls and whose volume depends on the relative position of the walls, two opposite side walls (2) being joined along a common connecting portion (5), c h a r a c t e r i s e d in that a first gas-filled duct means (11) is arranged  
10 in the connecting portion (5) along at least a first side (12) of the container (1).
2. A container (1) as claimed in claim 1, in which the first gas-filled duct means (11) is arranged in the connecting portion (5) also along a second side (13) of  
15 the container (1) opposite to the first side (12).
3. A container (1) as claimed in claim 1 or 2, in which the first gas-filled duct means (11) comprises at least one gap arranged in said connecting portion (5) and formed between said side walls (2), said gap forming a  
20 gas-filled duct by a gaseous medium being introduced into the same.
4. A container (1) as claimed in any one of the preceding claims, in which the first gas-filled duct means (11) is continuous along its entire length along each  
25 side.
5. A container (1) as claimed in any one of the preceding claims, in which the connecting portion (5) on the first side (12) and/or the second side (13) of the container (1) comprises a carrying means (14) which accommodates a second gas-filled duct means (16).  
30
6. A container (1) as claimed in any one of the preceding claims, in which the first gas-filled duct means (11) is continuous with the second gas-filled duct means (16).
- 35 7. A container (1) as claimed in any one of the preceding claims, in which the first gas-filled duct means

(11) communicates with the second gas-filled duct means (16).

8. A container (1) as claimed in any one of the preceding claims, in which the gas-filled duct means (11, 5 16, 18)) are filled with air.

9. A container (1) as claimed in any one of the preceding claims, which is made of a material containing a filler of mineral material and a binder of polyolefin material.

10 10. A container (1) as claimed in claim 9, in which the mineral material is chalk (calcium carbonate).

11. A method of producing a container (1) with features as claimed in any one of claims 1-10, c h a r - a c t e r i s e d i n

15 that at least one gap is formed between the side walls (2) in said connecting portion (5) in connection with the forming thereof, and

20 that each gap is filled with gas and sealed to form a gas-filled duct (11, 16, 18) in connection with the filling of the container (1).

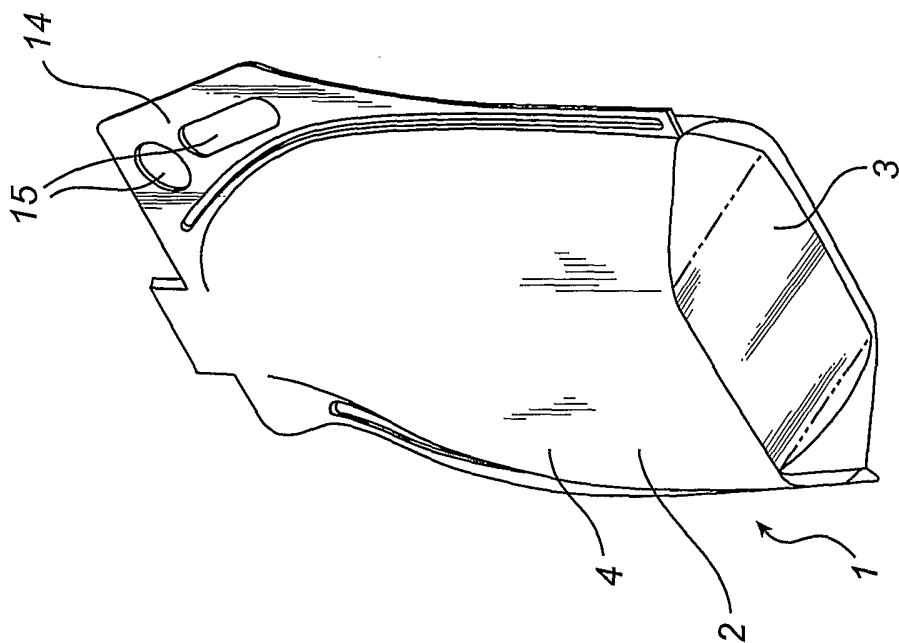


Fig. 1B

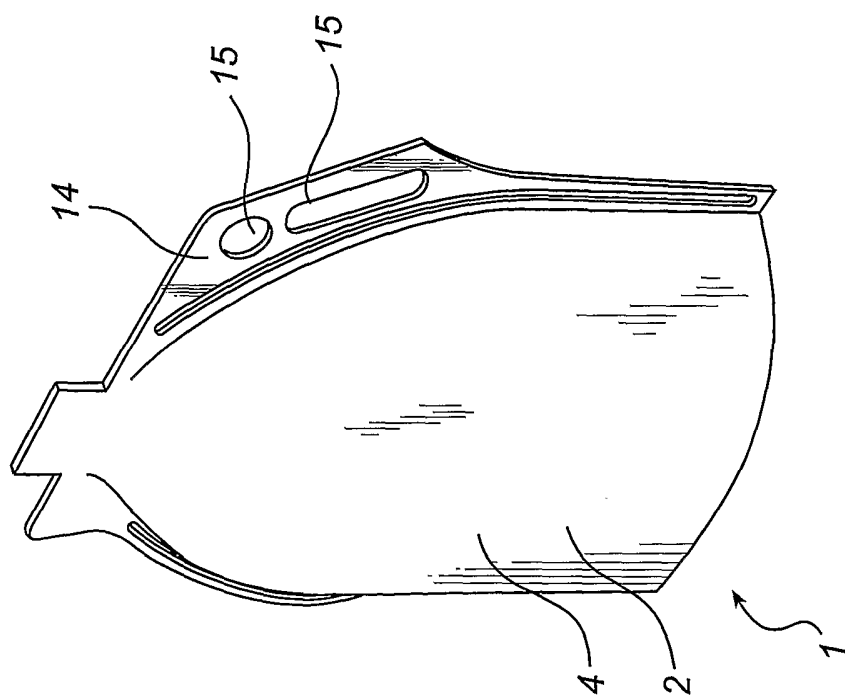


Fig. 1A

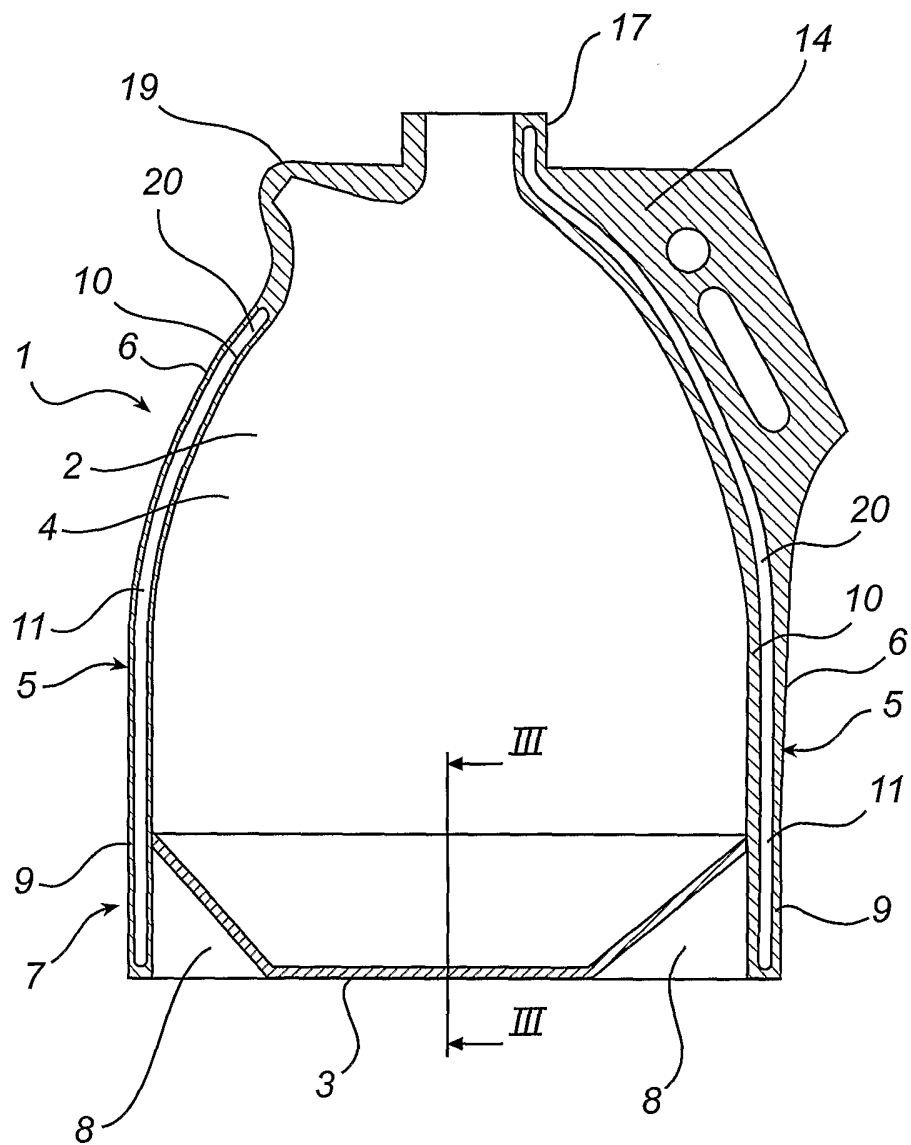


Fig. 2A



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*Snitt III - III*

*Fig. 2B*

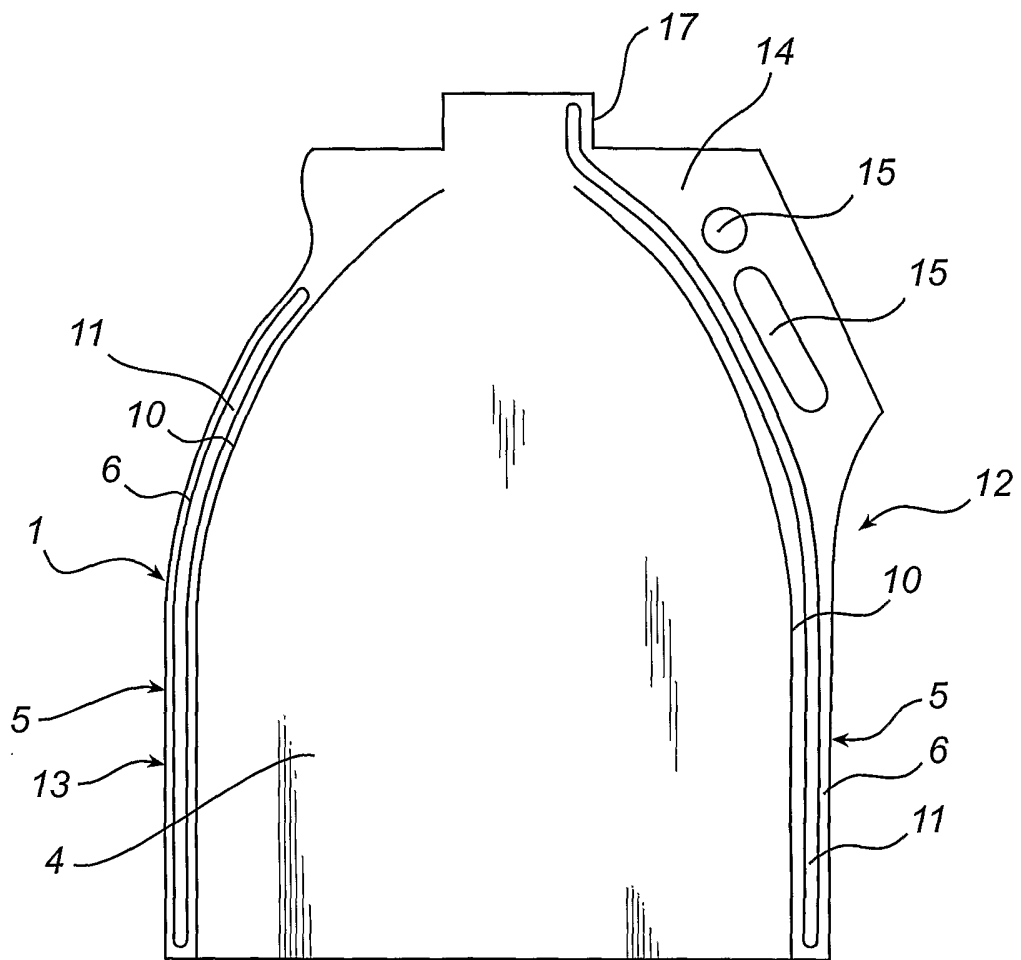


Fig. 3A

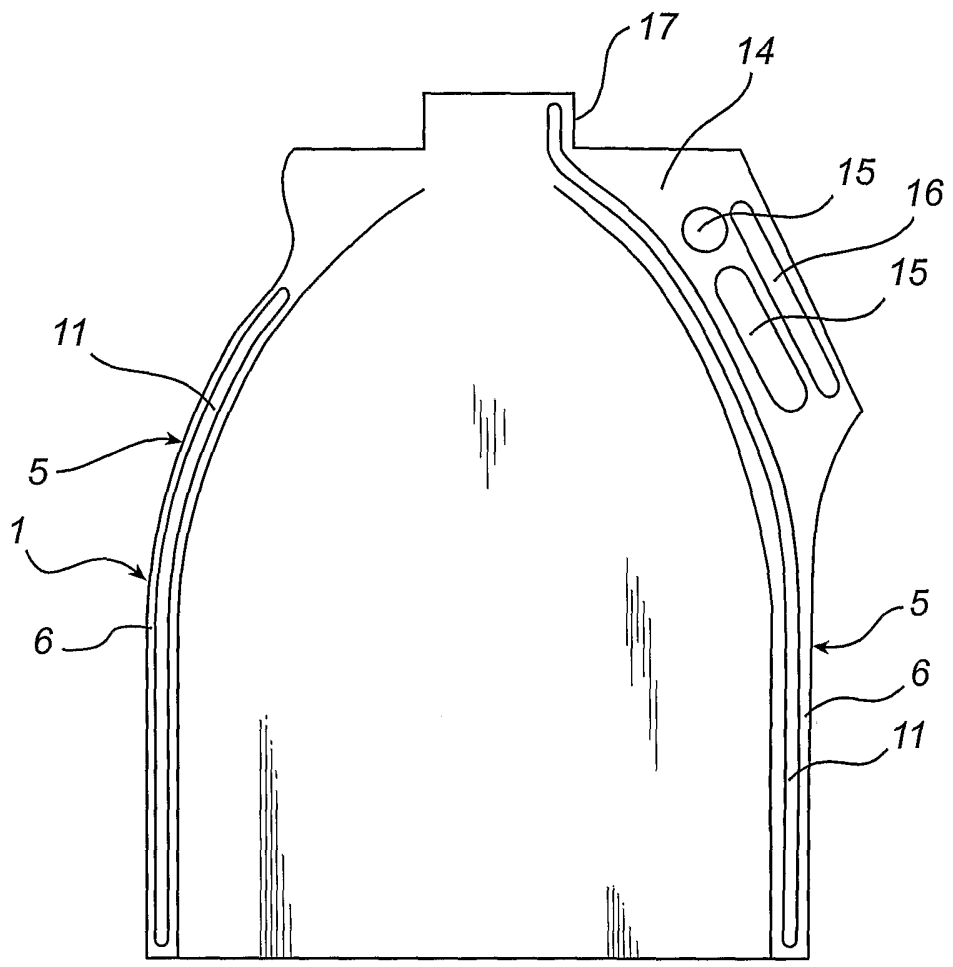
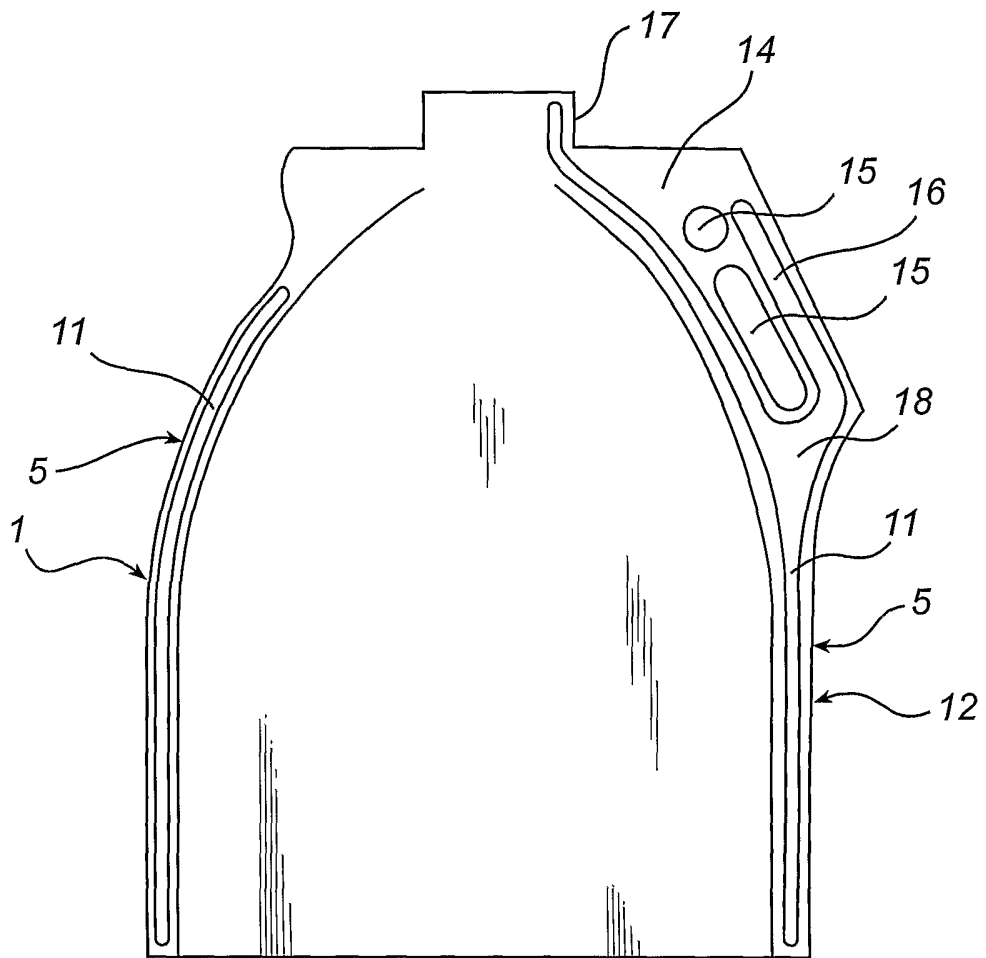


Fig. 3B



*Fig. 3C*

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 02/00764

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B65D 33/36, B65D 33/38, B31B 19/84

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B65D, B31B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, PAJ EPOQUE, FULLTEXT, INSPEC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	SE 513561 C2 (ECO LEAN AB), 2 October 2000 (02.10.00), figures 1-2, 6, page 9, line 32 - page 10, line 9, page 10, lines 22-37 --	1-11
A	US 3742994 A (PHILIP PENSAK), 3 July 1973 (03.07.73), figures 1-2, 5, column 1, lines 3-8 --	1-11
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 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents:

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Date of the actual completion of the international search

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## INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP 0389257 A1 (COLGATE-PALMOLIVE COMPANY (A DELAWARE CORPORATION)), 26 Sept 1990 (26.09.90), figures 1-10, abstract  --	1-11
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