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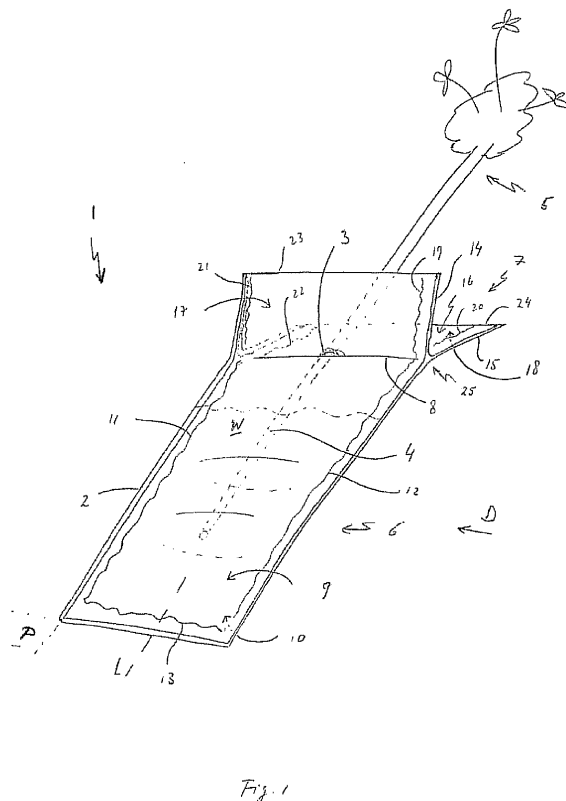
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(54) **A container serving as a substantially closed fluid reservoir for feeding a cut flower and a method of manufacturing a container**

(57) The invention relates to a container (1) serving as a substantially closed fluid reservoir for feeding a cut flower (5). The container (1) comprises a container wall (2) formed from a sheet material, the container wall (2) being provided with an aperture structure (3) for receiving a stem end of a flower (5), wherein the container (1) is integrally formed. The invention also relates to a method of providing a container. The method includes the steps of providing a strip of sheet material, creating an aperture structure for receiving a stem end of a flower in the container, folding the sheet over in overlapping arrangement, such that free ends of the folded sheet are contiguous at a bottom of the container, and connecting bottom and longitudinal edges of the folded sheet to form the substantially closed fluid reservoir.



Description

[0001] The invention relates to a container serving as a substantially closed fluid reservoir for feeding a cut flower, comprising a container wall formed from a sheet material, the container wall being provided with an aperture structure for receiving a stem end of a flower.

[0002] Such containers are known for preserving flowers, in particular cut flowers, more in particular cut flowers having long stems such as the anthurium (Araceae), Orchids, the Cymbidium, the Aronskelk and the Gerbera, for temporal storage and transport.

[0003] Japanese patent publication JP 8172910 discloses such a container serving as a substantially closed water reservoir feeding the cut flower. The container comprises a water reservoir and an opening receiving the stem end of the flower. The opening is surrounded using an elastic shrinkable string.

[0004] For the purpose of filling the reservoir with water, a tube can be inserted into the opening. Similarly, a stem end of the flower is inserted into the opening of the reservoir. However, it appears in practice that problems arise in localizing the opening and in suitably inserting the tube and the flower end, especially in the process of automating the step of filling the reservoir with water and the step of inserting the flower stem end. Further, after removing the tube and after inserting the flower stem end, it is highly desirable that the opening closes substantially free of leakage, so that the flower and the water reservoir can be stored and/or transported in a mainly horizontal position.

[0005] In view of the total production costs of cut flowers, it is desirable that the price of manufacturing containers for cut flowers decreases.

[0006] It is an object of the invention to provide a container according to the preamble that can be realized at lower costs. Thereto, the container according to the invention is integrally formed.

[0007] By forming the container as one piece, it is not required to assemble separate elements, thereby saving production steps, so that the containers can be formed at lower costs.

[0008] Preferably, the sheet material includes plastics material only, thereby saving even further costs in the manufacturing process.

[0009] In an advantageous embodiment according to the invention, the sheet is folded over in overlapping arrangement, such that free ends of the folded sheet are contiguous at a bottom of the container, thereby providing an efficient manufacturing process for the container. By folding the folded sheet back on itself, in an elegant way an integrated and strengthened gripping section can be formed for gripping the container during the process of filling the reservoir with a fluid and during inserting the flower stem end through the aperture structure. The gripping section can thus be formed as two 2-ply flaps.

[0010] Further, by locating the aperture structure on a folding line of the folded back sheet, the aperture struc-

ture can remain in a fixed position when gripping the two 2-ply flaps, thereby facilitating the process of finding the aperture structure for filling the reservoir with a fluid and for inserting the flower stem end. In addition, when releasing the two 2-ply flaps, the aperture can be closed substantially free of leakage. Due to the flap geometry, the flaps sheet assists in closing the aperture.

[0011] Further, the invention relates to a method of manufacturing a container.

[0012] Other advantageous embodiments according to the invention are described in the following claims.

[0013] By way of example only, embodiments of the present invention will now be described with reference to the accompanying figures in which

Fig. 1 shows a schematic perspective view of a first embodiment of a container according to the invention;

Fig. 2 shows a schematic perspective view of a second embodiment of a container according to the invention;

Fig. 3 shows a schematic perspective partial view of a third embodiment of a container according to the invention;

Fig. 4 shows a flow chart of method steps according to the invention;

Fig. 5 shows a schematic view of a row of containers shown in Fig. 1;

and

Fig. 6 shows a schematic perspective view of the container of Fig. 1.

[0014] The figures are merely schematic views of preferred embodiments according to the invention. In the figures, the same reference numbers refer to equal or corresponding parts.

[0015] Figure 1 shows a schematic perspective view of a container 1 according to the invention, serving as a substantially closed fluid reservoir for feeding a cut flower. The container 1 comprises a container wall 2 formed from a sheet material that is provided with an aperture structure 3 for receiving a stem end 4 of a flower 5. The container 1 is integrally formed from a single material. Preferably, the sheet is made from a flexible, fluid impermeable material such as a plastic foil material, so that the position and orientation of the wall 2 may be adjusted to a specific stem end 4 geometry. More preferably, a fluid impermeable material is used for forming the container wall 2.

[0016] Typically, the sheet foil comprises polyethylene (PE), polypropylene (PP), linear low density polyethylene (LLDPE) or metallocene linear low density polyethylene (m-LLDPE) having a thickness between approximately 50 micrometer and approximately 125 micrometer, thereby providing a cheap, light and compact basic material. However, also other foil materials and/or other dimensions can be applied. A m-LLDPE foil material has the advantage of providing a relatively high and uniform ma-

terial quality, providing good elasticity and stretch characteristics, and having a relatively low heat shrinkage. Preferably, the container wall 2 is a stretch foil, thereby facilitating that the stem end 4 can be inserted in the container 1 in a relatively easy way. More preferably, the foil stretches during the process of inserting the stem end 4 in the container 1 and then retracts around the stem end perimeter to provide a fluid tight sealing, so that the container and the stem can be stored and/or transported in a mainly horizontal position without substantial loss of the fluid in the container.

[0017] The principle of the water tightness of the film surrounding the stem is based on the rather high level of elastic and inelastic deformation of the plastic film material in combination with sufficient high tear strength. When a stem end is pushed through a pre-formed initiation spot in the film, the film deformation will be partly elastic, inelastic and plastic. Under the condition that no tearing occurs, the elastic and inelastic deformation will cause a circumferential stress on the stem and herewith the water tightness of the water container. The elastic and inelastic deformation is proportional to the strain at yield. The strain level at yield of the film applied is preferably at least 5 % and more preferably exceeding 15 %.

[0018] The force that is required for pushing a stem through a pre-formed initiation spot is determined by the thickness and the drawing stress of the film material. Typically, hardly stretched flexible PE (polyethylene) films having a thickness between about 75 and 125 micrometer provide a cheap, light and compact choice of film material.

[0019] PE (polyethylene) films, especially flexible ones, which are hardly stretched during production, show excellent sealing and welding capacity. Stretched, also called oriented, flexible films can also be applied but require special measures during the production of the container by welding to prevent dramatic shrinkage. Stretched films will be more appropriate when the container is obtained by a low temperature bonding process, for example adhesive bonding.

[0020] Besides PE, other types of plastic monolayer and multilayer films can be applied for the production of the container, for example plastic film based on PP (polypropylene), EVA (ethylene vinyl acetate) and TPE (thermoplastic elastomer).

[0021] The container sheet is folded over in overlapping arrangement, such that free ends of the folded sheet are contiguous at a bottom of the container. The folded sheet forms a single overlap in a main section 6 of the container. Further, the folded sheet is folded back on itself in a gripping section 7 of the container. The gripping section 7 is used for gripping the container and fixing the aperture structure in a stable position. Then, the reservoir can be filled and the flower stem end can be inserted through the aperture structure. The strengthened and integrated gripping section is formed by a double overlap including two 2-ply flaps 14, 15. The reservoir is formed by welding the folded sheet at bottom and longitudinal

edges.

[0022] The container includes a main section 6, also called sachet, forming a reservoir during use of the container, and a gripping section 7 that are mutually connected via a connection line 8 that may be implemented as a folding line. Optionally, the sachet is provided with an adhesive layer on the outer surface for connecting the container to a storage or transport box. When positioned upright, the main section 6 constitutes a bottom part of the container 1 that may be filled with a fluid such as water W optionally including nutrients while the gripping section 7 constitutes a top part of the container 1. The gripping section 7 is arranged for gripping the container 1 near the aperture structure 3.

[0023] In the embodiment shown, the main section 6 includes two overlapping wall sections, viz. an upper section 9 and a lower section 10 that are interconnected via an interconnection structure including interconnection side sections 11, 12 and an interconnection bottom section 13. By interconnecting edge sections of overlapping foil material a water impermeable container wall is realized. The interconnection structure may be realized by sealing the upper foil section 9 to the lower foil section 10, thus forming a weld. However, also other interconnection structure can be formed, e.g. by mutually gluing the upper and lower sections 9, 10. Further, the reservoir section 6 is closed at a top side, in the shown embodiment by the folding line 8.

[0024] In Fig. 1, the gripping section includes two gripping parts 14, 15 extending away from a plane P wherein the main part 6 of the container 1 extends. The gripping parts 14, 15 include a common top layer 16 that is folded back along the folding line 8 and includes the aperture structure 3. The aperture structure is located on a folding line of the folded back sheet to provide an aperture that can easily be found and opened when the gripping flaps are gripped and that can be closed substantially free of leakage when the gripping flaps are released after inserting the stem of the flower. Further, the common top layer 16 is connected to corresponding bottom layers 17, 18 to form the gripping parts 14, 15. In the shown embodiment, the connection is performed by side connection structures 19-22 and folding lines 23, 24. It is noted that, similar to the interconnection structure of the main section 6, other connection types may be used to connect the common top layer 16 with the corresponding bottom layers 17, 18. It is further noted that, instead of using a common top layer 16, also separate top layers may be used for realizing the gripping parts 14, 15. Further, in principle, the gripping parts may be formed by a single layer. However, by realizing the gripping parts as a double layer, the strength of the gripping section increases and any chance of damage of the container 1 in the gripping process is reduced. Further, the container 1 can in an advantageous manner be realized using a single foil sheet as is explained in more detail below.

[0025] As shown in Figure 1, in the described embodiment of the container 1 according to the invention, the

container wall 2 is substantially constant in cross section with respect to a longitudinal axis L of the container 1, thereby simplifying the production process of the container 1. Also other geometries can be designed, e.g. having a main part 6 that is provided with a downwardly tapered bottom part 13.

[0026] In a cross-section along the longitudinal axis L of the container 1, the container may have a T- or Y-shaped form. In the embodiment shown in Fig. 1 the extending gripping parts 14, 15 form the upper segment or upper arms of an Y-shaped form, the intersection point 25 of the Y coinciding with the connection line 8.

[0027] The aperture structure 3 is realized in the common top layer and can be formed in several ways. As an example, the aperture structure includes an aperture or opening that may be formed in a punching or cutting process. The aperture diameter is preferably less than approximately 3 mm. Alternatively, the aperture structure may include a puncturable area that is e.g. realized by locally pre-treating or weakening the common top layer 16. Preferably, the aperture structure 3 is located in a container wall section that is sealing free, thereby improving sealing properties of the aperture structure after inserting the stem end 4 of the flower 5.

[0028] Preferably, the aperture structure 3 is located in a sheet area that is free of sealing, so that the sealing properties of the aperture are not deteriorated.

[0029] Figure 2 shows a schematic perspective view of a second embodiment of a container 1 according to the invention. Here, the gripping parts 14, 15, also called flaps, are interconnected at their side connection structures 19-22, so that, in a cross-section along the longitudinal axis L of the container 1, the container has an 1-form, thereby saving a gluing or sealing step.

[0030] Figure 3 shows a schematic perspective partial view of a third embodiment of a container 1 according to the invention. Here, the common top layer 16 is shaped as a funnel 26 by realizing tapering folding lines 27, 28 between the aperture structure 3 and side edges 29, 30 of the main part 6. By providing a funnel-shaped structure, the process of finding the aperture structure for filling the container with a fluid such as water and/or inserting the stem end of the flower is simplified. The container can be filled by inserting a tube through the aperture structure 3 and by flowing a fluid through the tube into the container reservoir. Further, as an option, the gripping section 7 is provided with gripping openings 31, 32 for improving the process of gripping the container 1. The gripping openings 31, 32 are sealed to prevent fluid leakage from the container. As a further option, for the purpose of enhancing a lining process, the folding lines 23, 24 can be provided with a specific edge profile such as a staggered pattern.

[0031] Figure 4 shows a flow chart of method steps according to the invention. The method is used for manufacturing a container 1 serving as a substantially closed fluid reservoir for feeding a cut flower. The method comprises a step 100 of providing a strip of sheet material, a

step 110 of creating an aperture structure 3 for receiving a stem end 4 of a flower 5 in the container 1, a step 120 of folding the sheet over in overlapping arrangement, such that free ends of the folded sheet are contiguous at a bottom of the container, and a step 130 of connecting bottom and longitudinal edges of the folded sheet to form the substantially closed fluid reservoir. A single foil may be folded along folding lines separating the upper foil section 9 and the lower foil section 10 from the corresponding bottom layer 17 of the gripping parts 14, 15. Further, the foil can be folded along a folding line 23 between the bottom layer 17 and the common top layer 16, along a folding line 24 between the common top layer 16 and a further bottom layer 18, and along a central folding line 8' in the common top layer 16. As such, the entire container 1 may be realized from a single foil, either in flat form or on a roll. As an advantage, a container is provided that is very compact in terms of volume during storage and transport before being used. Preferably, the method according to the invention is at least partially performed by machine operations, such as the folding process, the connecting process using gluing or sealing technology, and/or the process of providing the aperture structure.

[0032] After the container has been formed, the container can be filled with a fluid such as water, optionally provided with conditioning elements for conditioning the flower 5. The fluid filling procedure may include gripping the gripping section, inserting a needle through the aperture structure and feeding the fluid into the container 1. Then, the stem end 4 of a flower 5, preferably a cut flower having a long stem having a smooth surface and a mainly circular or mainly oval cross section, may be inserted, through the aperture structure 5, into the container. It is noted that also the fluid filling step and/or the stem end inserting process can be performed using machine operations. Further, the container may be pre-filled with a fluid before storage and/or transport. In principle, the container can also be filled with the fluid after the flower stem end has been inserted.

[0033] Figure 5 shows a schematic view of a sequence of containers 1 that have been realized on a strip of foil material 50 separated by a perforation contour 51. The strip can be wound to form a roll containing the containers 1, so that the sequence of containers constitute the roll. However, the strip can also be folded, e.g. in a zigzag configuration, for storage in a box. Otherwise, the containers can be placed on top of each other to form a stack of containers 1. Longitudinal edges may form cut or separation lines.

[0034] Figure 6 shows a schematic perspective view of the container shown in Fig. 1. The gripping section 7 including the gripping parts 14, 15 are clearly visible. At the intersection point 25, the gripping parts 14, 15 are connected via a central folding line 8'. The aperture structure 3 is located on said folding line 8'. Further, Fig. 6 shows the folding lines 23, 24 forming borders of the gripping parts 14, 15. The invention is not restricted to the

embodiments described herein. It will be understood that many embodiments are possible.

[0035] As an example, the container wall can be formed by either a single layer sheet or a multilayer sheet. Further, instead of realizing the entire container from a single material, the container may include a multiple number of materials, e.g. a first foil material and an integrated part made of a second foil material. The integrated first and second foil material, e.g. a two-layer structure wherein the individual layers have been made from different foil material, then form a sheet from which the container is constructed. It is also noted that the container wall can be formed as a flexible or a rigid structure.

[0036] It is further noted that the gripping section may be provided with a single gripping part or with three or more gripping parts. The gripping parts may also include one or more rigid elements for further facilitating gripping the container.

[0037] According to an aspect of the invention, the container may be formed using more than two foil layers, e.g. three or more foil layers.

[0038] It is further noted that instead of filling the container with water, the container can also be filled with other fluids such as an aqueous solution or a solvent.

[0039] These and other embodiments will be apparent for the person skilled in the art and are considered to lie within the scope of the invention as defined in the following claims.

Claims

1. A container serving as a substantially closed fluid reservoir for feeding a cut flower, comprising a container wall formed from a sheet material, the container wall being provided with an aperture structure for receiving a stem end of a flower, wherein the container is integrally formed.
2. A container according to claim 1, wherein the sheet material includes plastics material only.
3. A container according to claim 1 or 2, wherein the sheet material includes PE, PP, EVA, TPE, LLDPE or metallocene LLDPE foil material.
4. A container according to any of the previous claims, wherein the sheet is folded over in overlapping arrangement, such that free ends of the folded sheet are contiguous at a bottom of the container.
5. A container according to any of the previous claims, wherein the folded sheet forms a single overlap in a main section of the container.
6. A container according to any of the previous claims, wherein the folded sheet is folded back on itself in a gripping section of the container.

7. A container according to any of the previous claims, wherein the gripping section is formed by two 2-ply flaps.

8. A container according to any of the previous claims, further comprising welds at bottom and longitudinal edges.

9. A container according to any of the previous claims, wherein the aperture structure is located on a folding line of the folded back sheet.

10. A container according to any of the previous claims, wherein the common top layer is shaped as a funnel.

11. A container according to any of the previous claims, wherein, in a cross section across the longitudinal axis of the container, the container has a T- or Y-shaped form.

12. A method of manufacturing a container serving as a substantially closed fluid reservoir for feeding a cut flower, including the steps of:

- providing a strip of sheet material;
- creating an aperture structure for receiving a stem end of a flower in the container;
- folding the sheet over in overlapping arrangement, such that free ends of the folded sheet are contiguous at a bottom of the container; and
- connecting bottom and longitudinal edges of the folded sheet to form the substantially closed fluid reservoir.

13. A method according to claim 12, further including the step of:

- folding the folded sheet back on itself for forming two 2-ply flaps.

14. A method according to claim 12 or 13, further including the steps of:

- filling the container with a fluid; and
- inserting the stem end of the flower into the container through the aperture structure.

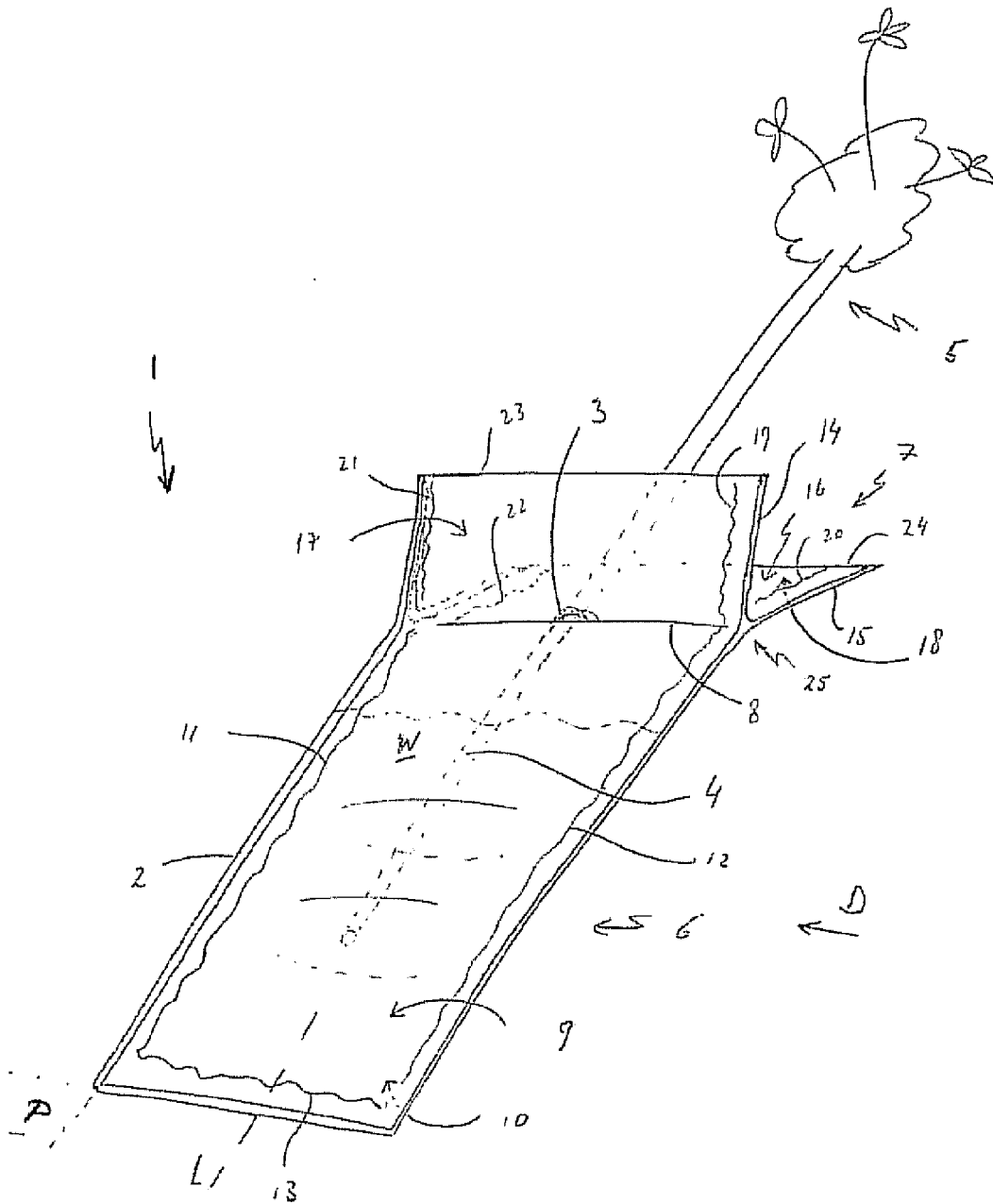


Fig. 1

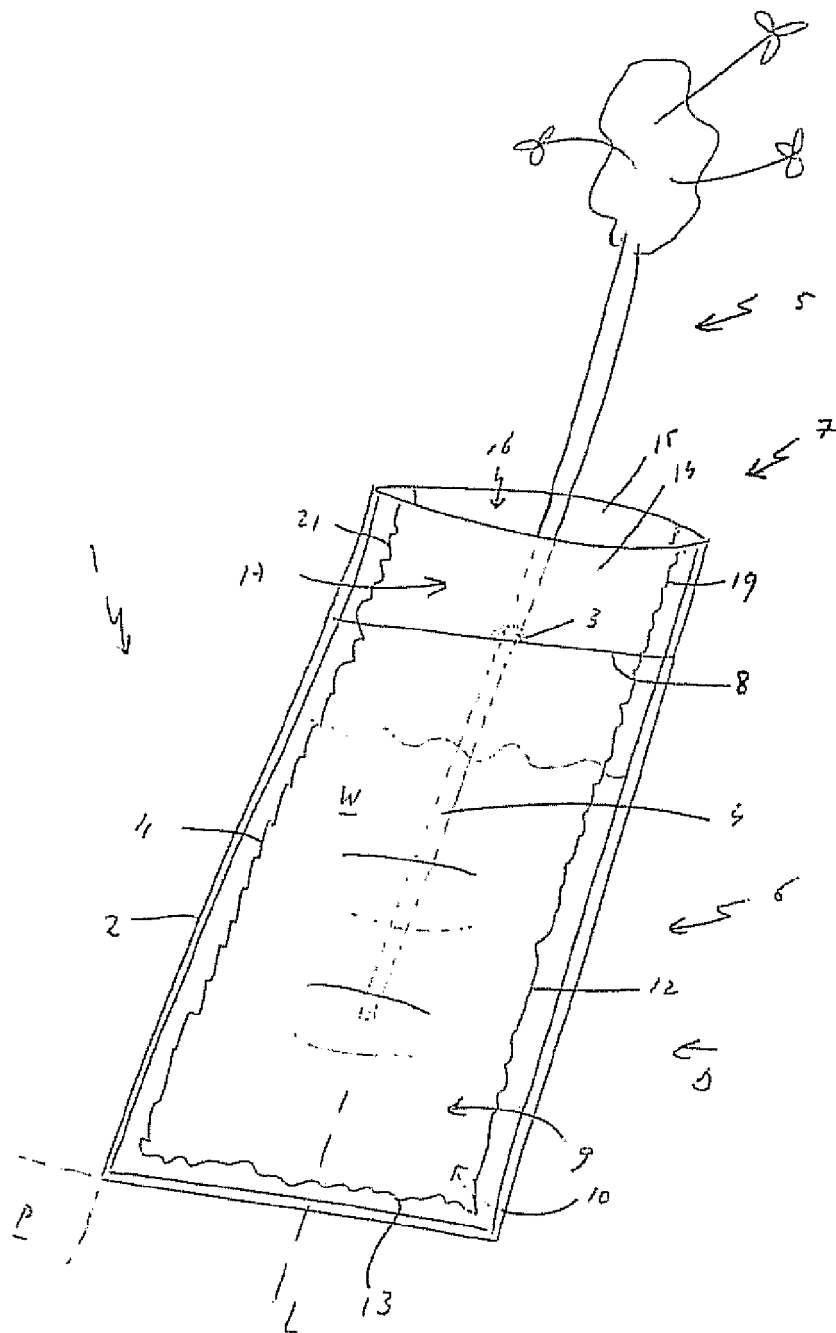


Fig. 2

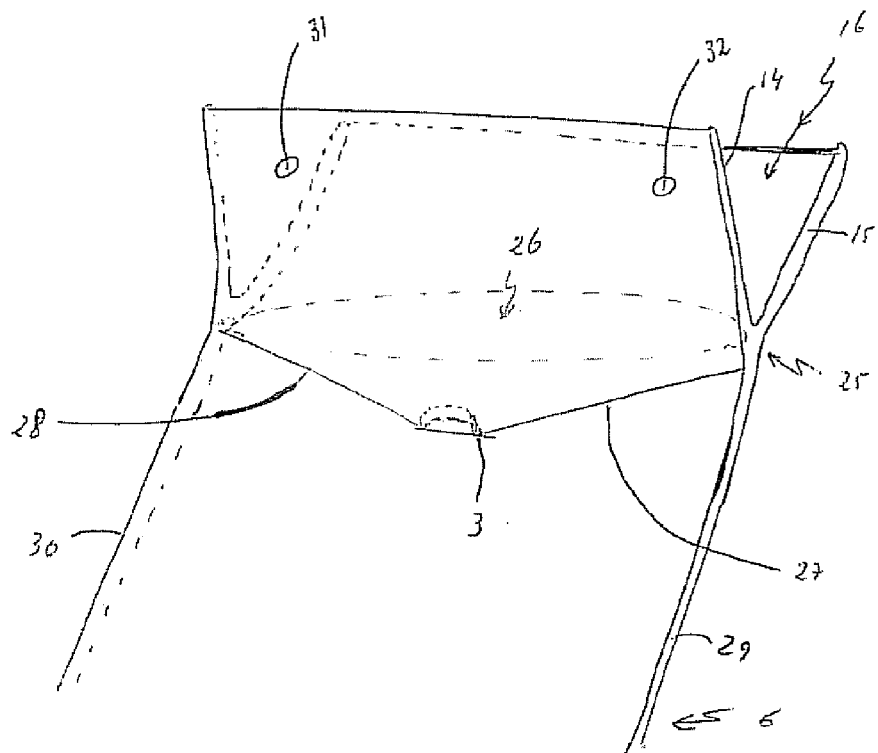


Fig. 3

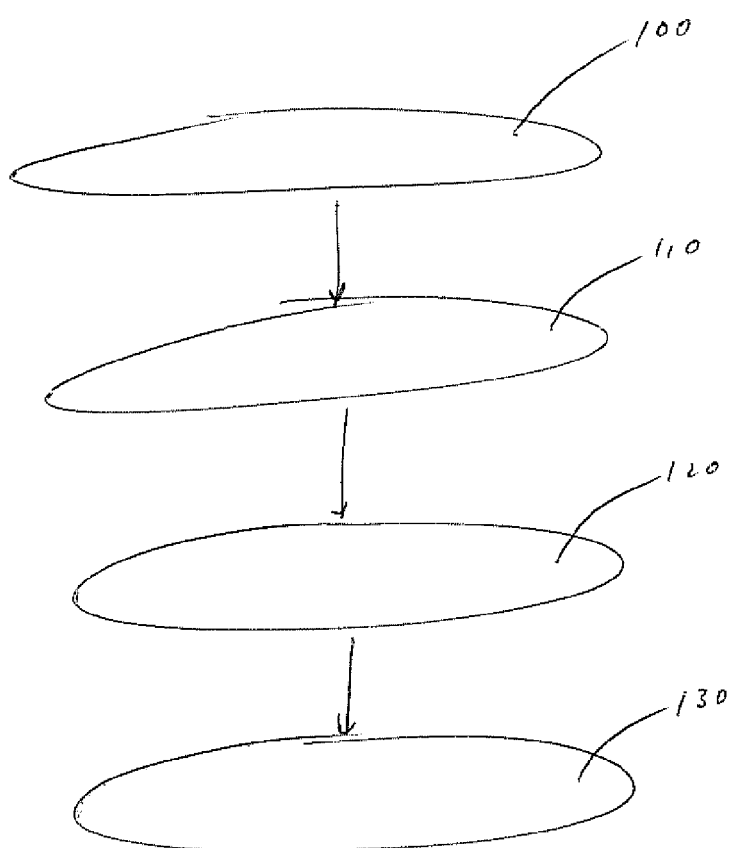


Fig. 4

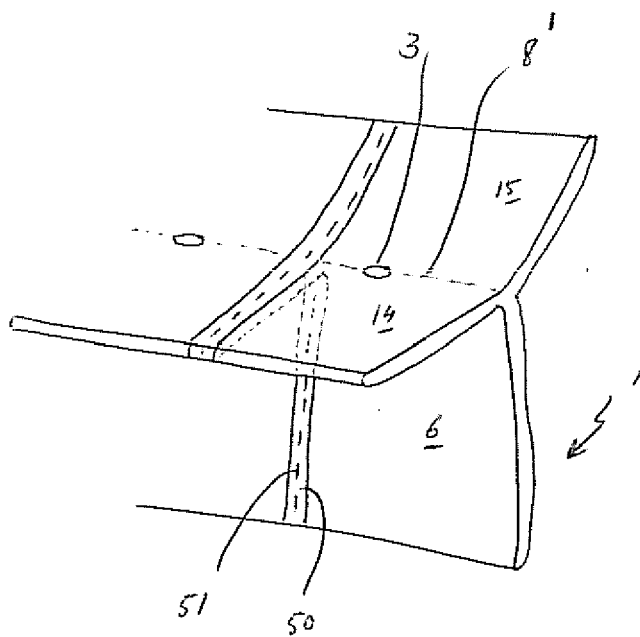


Fig. 5

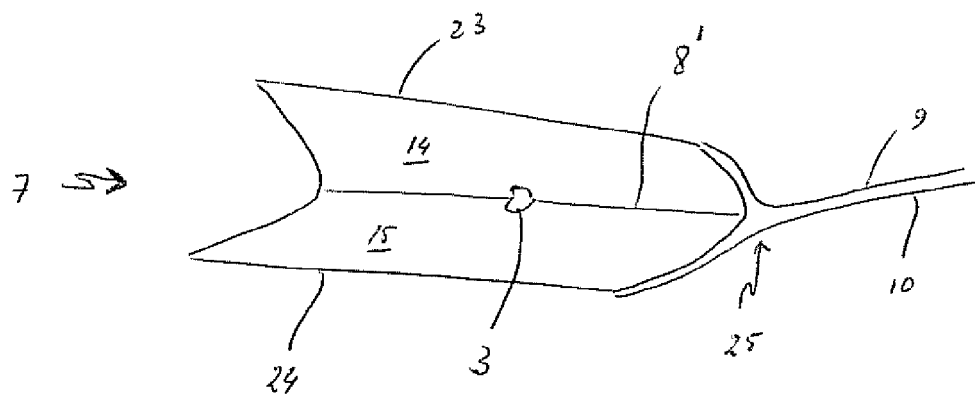


Fig. 6



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Application Number
EP 09 17 9964

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 20 May 2010	Examiner Merckx, Alain
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			

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

EP 09 17 9964

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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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