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(71) Applicant: **Cartonificio Fiorentino S.p.A.**
55011 Altopascio (LU) (IT)

(72) Inventor: **Padovani, Mario**
50019 Sesto Fiorentino (Firenze) (IT)

(74) Representative: **Bardini, Marco Luigi et al**
Società Italiana Brevetti SpA
Corso dei Tintori, 25
50122 Firenze (IT)

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(54) **Cardboard packaging container with bag-in-box for containing liquid or viscous products**

(57) A tank pack comprising a box-shaped body (1) with a bottom (1d) and defining a housing (6), made from cardboard, and a sack (S) made from plastic for containing liquids, purees or similar products suitable for being housed in the housing (6), the sack (S) foreseeing at least one outlet valve (Vu) and one inlet valve (Vi), the outlet valve being connected to a cardboard support base (10) of the sack (S) comprising a base sheet (12) suitable for being arranged laying over the bottom (1d), a front wall (1a) of the body (1) foreseeing an opening (2) to externally expose the outlet valve (Vu), characterised in that the support (10) also comprises a front sheet (13) foldably connected to the base sheet (12), comprising anchoring means (15) for the outlet valve (Vu) and suitable for internally laying over the front wall (1a) of the body (1), and a manipulation and fastening flap (14) foldably connected to the front sheet (13) so as to be accessible near to or at the upper end of the body (1). The manipulation and fastening flap (14) preferably comprises means for fastening the support (10) to the body (1) and grip means (16) suitable for allowing manual gripping by the worker.

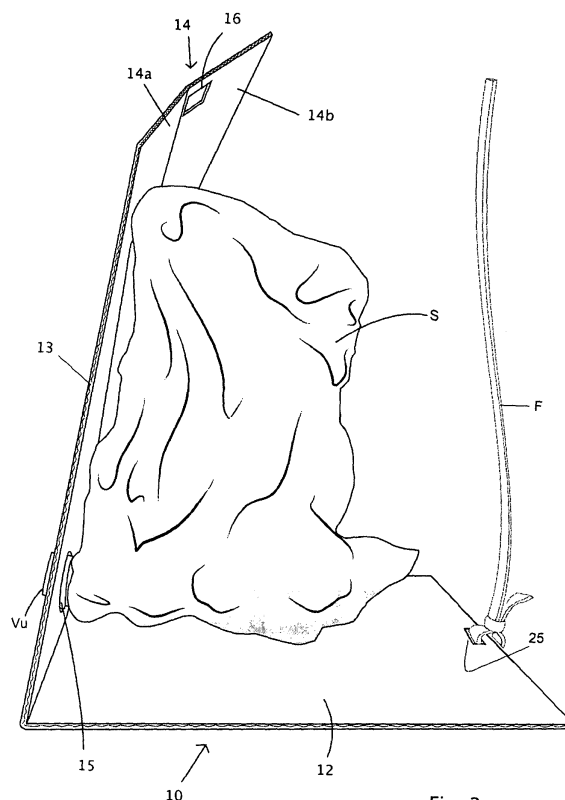


Fig. 2

Description

[0001] The present invention concerns the field of the production of containers made from paper-based material, and more specifically it concerns a new tank packaging intended for storing and transporting liquid or viscous materials in the field of agrifoodstuffs and chemicals, such as in particular, but not exclusively, preserves, mashed substances etc.

[0002] Cardboard tank packagings are known and highly appreciated due to their biodegradability and ease of recycling. The parallelepiped shape is preferred, which allows the transportation and storage logistics to be optimized. The packaging comprises an outer body made from cardboard of suitable strength, which houses a collapsible sack made from plastic intended for containing liquids. The sack is supported by a cardboard base that is inserted into the outer body for internally superimposing the bottom of the body. The base and the sack are fixedly connected to one another by an outlet valve for the outlet of the liquid from the sack. Said valve, when arranging the sack with the relative base inside the body, has to be placed in correspondence with a preformed opening on a side wall of the body, near to the bottom. In addition to the outlet valve, the sack includes a filling valve, in an opposite position to the outlet valve.

[0003] Such known packagings have two main types of drawbacks. Firstly, the arrangement of the sack with its support base in the body is very difficult and troublesome, in particular as far as the control of the correct positioning of the valve is concerned, working from outside of the body. Regarding this, it is worth remembering that the body has very high side walls, for which reason the arms of a worker cannot reach the area of the bottom inside the body, and they are also hindered by the presence of the sack. Secondly, when the sack is progressively emptied of its content, and consequently collapses in the body, the folds form pockets that trap the material, preventing complete emptying unless a part of the sack is lifted manually, inserting the arm inside the body, with the difficulties already mentioned for the operator.

[0004] The object of the present invention is to solve the aforementioned problems, by providing a new tank packaging that, thanks to original constructive features, is easier to assemble and more user-friendly and safe in use than analogous known packagings.

[0005] According to the present invention, this and other objects are achieved with a cardboard tank packaging the essential characteristics of which are defined in the first of the attached claims.

[0006] The characteristics and advantages of the packaging according to the present invention will become clearer from the following description of an embodiment thereof, given as an example and not for limiting purposes, with reference to the attached drawings, in which:

- figure 1 schematically represents a perspective view of a cardboard packaging according to the invention;

- figure 2 shows a side view of an inner sack and the relative cardboard support in the packaging of figure 1;
- figure 3 is a front view of the assembly of figure 2;
- figure 4 is an enlargement in the area of the outlet valve of the assembly of figures 2 and 3;
- figures 5 and 6 show respective successive and final steps of the stabilisation procedure of the assembly of the previous figures to the rest of the pack, through perspective views of the upper area of the latter;
- figures 7 to 9 are respective cardboard flat blanks of different embodiments of the support of the sack according to the invention, cut edges being represented with a continuous line, while discontinuous lines represent folding lines, the blank of figure 7 substantially corresponding to the support in the embodiment according to the previous figures; and
- figure 10 is a flat blank of a further, different embodiment of the support of the sack according to the invention, intended for a prism-shaped pack with an octagonal base.

[0007] With reference to figures 1 to 7, a packaging according to the invention comprises a box-shaped body 1 made from corrugated cardboard, in the illustrated embodiment having a parallelepiped shape, substantially cubic, formed according to the usual techniques of the field. On a front wall 1a, near to the bottom 1d, an opening 2 is formed for the insertion and exposure to the outside of an outlet valve Vu which shall be discussed in greater detail later on.

[0008] From the upper edges of the side walls of the body 1 respective upper flaps foldably extend, and more specifically: a front flap 3a, at the front wall 1a, two side flaps 3b at respective side walls 1b adjacent to the front wall 1a, and a rear flap 3c at a rear wall 1c parallel and opposite to the front wall 1a. The upper flaps have key engagement means formed on them, suitable for ensuring that they are engaged with one another to obtain a partial top closure of the body 1. Such engagement means comprise, in particular, arrow-shaped tabs 4 on the free margins of the front and rear flaps 3a, 3c, suitable for being inserted in slits 5 that extend on the side flaps 3b, according to a construction technique that is commonly used in the field.

[0009] In the housing 6 internally defined by the body 1, one or more (two in the illustrated example) tubular sleeve structures 7, 8 for stiffening and strengthening the side walls are preferably inserted. In practice, these are strips folded into a sleeve shape so as to define, in turn, side walls that internally line the walls 1a-1c of the body 1, thickening them. On the front walls 7a, 8a that lay on the front wall 1a respective openings 7b, 8b are formed, corresponding to the opening 2 for the outlet valve Vu.

[0010] The body 1 also comprises a cover 9, formed according to conventional techniques, to shut the housing 6 on top. This housing 6 houses a sack S (figure 2), made from plastic such as a transparent food contact PE

film of suitable strength, connected to a support made from corrugated cardboard 10 that, due to its peculiar characteristics, represents the core of the present invention.

[0011] The support 10 consists of a strip on which parallel and consecutive transverse folding lines 11 define (reference is made in particular to figure 7): a base sheet 12, suitable for internally superimposing the bottom of the body 1 and sized to this purpose; a front sheet 13 adapted to internally lay on the front wall 1a (and relative stiffening walls 7a, 8a); and a fastening flap 14 adapted to be arranged substantially flush with the upper edge of the body 1.

[0012] In greater detail, the base shape 12 is the actual lower support of the sack 9, whereas the front sheet 13, in a suitable position near to the fold with the base sheet 12 (defined by two adjacent side-by-side lines for better functionality), houses a fitting 15 for anchoring the valve Vu. The valve, with characteristics that can vary according to the prior art, is, in any case, represented by a rigid tubular element. In the depicted example the fitting (not represented in figure 1) is formed from a hole with a periphery having deformable radial tongues 15a, which allow for the insertion of the valve and hold it exerting a certain elastic clamping. As described shortly hereafter, the fitting can take up different configurations, according to the type of valve and, however, in accordance with what is already known as such.

[0013] Also the fastening flap 14 has a pre-cut fitting 17, in this case intended to hold an inlet (filling) valve Vi of the sack 9, in turn consisting of a rigid tubular element. Also in this case the fitting can take up different shapes, for example that of a seating shut by a foldable tongue that, by lifting, opens the seat itself to a lesser or greater extent, also acting as a holding element. The fitting 17 can also, like in the example here considered, be housed by an inner portion 14a of the flap 14, adapted to be articulated along one of the folding lines 11 with respect to an end portion 14b, all of this also in view of the positioning of the inlet valve in a stocking configuration that will be discussed shortly hereafter.

[0014] The fastening flap, in addition to grip windows 16, comprises a foldable tongue 18, with contoured ends, projecting from the free edge of the flap, free edge which corresponds to one of the transversal sides of the strip that realizes the support 10. The tongue 18 is suitable for laying over the front top flap 3a of the body 1, to engage with a slot 21 formed therein, and finally with a further, corresponding slot 19 in the same fastening flap 14. The front top flap 3a of the body 1 is also equipped with a passage 20 to give access to the inlet valve 18.

[0015] In use, the arrangement of the sack S in the housing 6 of the body 1 can be controlled by a worker precisely by operating from the outside on the fastening flap 14 through the grip windows 16, which act as handles, whereas the front sheet 13 constitutes an element for transmitting the displacement to the base sheet 12. Therefore, there is a real manoeuvrability of the support,

which can be arranged with precision, effortlessly and above all without needing to insert the arms in the housing 6. The same capabilities also make it easy to extract the sack/support assembly, when required.

[0016] A further advantageous characteristic deriving from the special structure of the support 10 consists in the possibility of anchoring the inlet valve Vi at the top, which, besides making the filling operations of the sack S easier, has the effect of supporting the latter as is emptied, preventing it from completely collapsing, counteracting the formation of folds and pockets that trap the liquid contained, and therefore promoting regular flow up to the end. If necessary, such a flow can also be further assisted by lifting the side of the base sheet 12 opposite the front sheet 13, so as to make the former close in rotation towards the latter and thus obtain a sort of squeezing of the sack. To this purpose, as represented in figure 2, a string F, to be gripped from the outside of the packaging, can be linked to a slot 25 formed in a suitable position in the base sheet 12.

[0017] It should also be noted that the assembly of the support 10 and the sack S, once extracted and separated from the body 1, can be folded neatly so as to occupy a very small space in a stocking arrangement. Indeed, thanks to folding lines (or creases) arranged in pairs, like in the example, it is possible to fold the two base and front sheets 12, 13 like a book, leaving in between the volume necessary to contain and clamp the encumber of the empty sack S and the valve Vi. The closure of the assembly can be ensured by the same tongue 18 that will engage with the aforementioned slot 25.

[0018] With reference now also to figures 8 and 9, numerous variants can be proposed in the configuration of the strip-like sheet that constitutes the cardboard support of the sack S. Firstly, in the embodiment of figure 8 it can be seen that the fastening flap can be more elongated, until it degenerates into an actual covering sheet 114 that shuts the entire opening gap, or open top, of the housing 6 of the body 1 and protects the sack S on top. The manipulation and fastening sheet 114 has two pairs of gripping windows 116, and at the end of the strip a foldable edge 123 to stabilize the sheet itself, being tucked in between the reinforcement sleeves 7, 8 and the rear wall 1c of the body 1.

[0019] Moreover, an inspection door 124 is foldably articulated at the center of the manipulation and fastening sheet 114. The foldable fastening tongue 118 in this case is actually formed by subtracting material from the door, at the opposite side to that of articulation. Furthermore, a locking tang 122 is arranged at the end of the base sheet 112, to act as a locking element of the assembly in the aforementioned stocking configuration folded like a book, engaging with the slot 119 that, when the support is assembled with the body 1, receives the tongue 118. Finally, it should be noted that an engagement fitting 115 of the outlet valve is shaped in this case more simply according to a polygonal outline, as in a different known standard.

[0020] In the embodiment of figure 9, the fastening, manipulation and shutting sheet 214 has in turn an inspection door 224, of a smaller size than in the previous case, and there can be noticed engagement fittings 215, 217 for the discharge and inlet (filling) valves, respectively, shaped again differently with respect to the previous examples, for both of the valves. In particular, in this case, and according to a further standard, known as such, there will be tongues 215a, 217a with an isosceles trapezoidal profile, incident to the periphery of a circular hole 215b, 217b and adapted to be lifted to make such a perimeter breakable upon the act of insertion of the relative valve. The stabilization of the sheet via the edge 223 on the rear side can make the presence of an engagement tongue superfluous; in fact, the tongue is indeed absent in this embodiment. Nevertheless, it is possible to see the slot 219 that in this case will only be used to engage with the locking tang 222 in the stocking arrangement.

[0021] Between the two solutions indicated above (covering sheet limited to a flap, or else a complete one shutting the entire open top of the housing 6), there can also be intermediate solutions, i.e. with a fastening, manipulation and covering sheet that partially shuts the open top of the housing, and carrying the engagement fitting of the upper valve cut on the relative free edge or transversal side. The latter edge can also provide for foldable keys that engage with slots of the bottom sheet, also in this case to the purpose of keeping the sheets clamped together in the stocking arrangement, again made possible by the folds/creases in adjacent pairs that, suitably spaced, ensure that there can be a properly compact boxing of the sack.

[0022] In all cases, the strip that makes the support 10 can also comprise, along the longitudinal sides, i.e. those that extend along the direction of development of the strip, but also along the transversal side opposite the fastening one, some tabs that can be folded towards the inside of the housing to consolidate the pack at the corners and increase the stability of the assembly, at the same time realizing side supports that make the inside of the corners more regular, avoiding the formation of gaps that could even cut the sack. An example of this is provided by the same figure 8, in which it is possible to see tabs 126 along the longitudinal sides of all three sheets. Furthermore, it is clear that the handles 16, 116, 216 can be positioned and configured differently, and that both the base sheet and the front sheet can have low surface extension in width through shaping or profiling of various kinds.

[0023] Furthermore, figure 10 highlights the possibility of using the invention also with packagings of a different shape than a parallelepiped, for example prisms with a hexagonal, octagonal or polygonal base and in general of any other profile. The flat blank represented in such a figure is entirely comparable to the example described earlier, with obvious adaptations to the profile of the base sheet 312 and fastening and manipulation sheet 314 (octagonal in this case). Otherwise, the components corre-

spond to those of the previous examples, as made clear by the congruence between the various reference numerals.

[0024] The body 1, and consequently the support structure 10 with the sack S, can of course be made according to various sizes, again resulting in an ecological but very strong pack. The assembly as described is made up of modules that are fitted together extremely easily. The support 10 is introduced from the outside without the need to manoeuvre the other components and acts also as a container of the sack. Along with the possibility of locking also the filling valve, it is even possible, contrary to known packagings, to use standard filling units that can work on the valve exposed and stabilized at the top. Thanks to the locking system of the upper flaps of the body 1, the side walls stay firmly and precisely upright, even after the sack has been filled.

[0025] The possibility of folding every component (even the body 1 that will, as mentioned, be made from a flat blank according to conventional methods), ensures that the packaging, in unassembled condition, occupies small spaces, with enormous advantages compared to conventional tanks. All of the components can be recovered and/or replaced when they have deteriorated. The use of cardboard, in addition to the obvious advantages over materials like plastic, iron and wood, also allows personalised prints to be applied, making a great advertising power available. Finally, the high thickness of the side walls constitute an effective insulating barrier that protects the product contained from thermal excursions, both during the summer and in extreme cold conditions.

[0026] All of the engagement systems with arrow-like keys can be replaced by analogous solutions appearing equivalent to a man skilled in the art. At least some of the cutting lines of the flat blank to which reference was made in the description can initially be formed as pre-cut lines, to be torn at the time of forming the packaging.

[0027] The assembly of support 10 and sack S with the special features here described and claimed is obviously to be considered in the scope of the present invention also when considered alone, that is apart and isolated from the body 1.

[0028] The present invention has been here described with reference to preferred embodiments. It should be understood that there may be other embodiments within the same inventive concept, as defined by the scope of protection of the following claims.

Claims

1. A tank-like packaging comprising a box-shaped body (1) made of cardboard with a bottom (1d) and defining a housing (6), and a sack (S) made of plastic material for containing fluids, mashed substances or the like, the sack (S) being adapted to be housed in said housing (6) and comprising at least one outlet valve (Vu) and at least one inlet valve (Vi), said outlet

- valve (Vu) being connected to a support (10) for the sack, made of cardboard and comprising a base sheet (12) adapted to be arranged laying over said bottom (1 d) of said body, a front wall (1 a) of said body (1) comprising an opening (2) for externally exposing said outlet valve (Vu), **characterized in that** said support (10) further comprises a front sheet (13) foldably connected to said base sheet (12), comprising anchoring means (15) for said outlet valve (Vu) and adapted to internally superimpose said front wall (1a) of said body (1), and a manipulation and fastening flap (14) foldably connected to said front sheet (13) so as to be accessible near to or at the upper end of said body (1).
2. The packaging according to claim 1, wherein said manipulation and fastening flap (14) comprises fastening means for fastening the support (10) to the body (1) and grip means (16) adapted to allow the grip by the hands of a worker.
 3. The packaging according to claim 1 or 2, wherein said manipulation and fastening flap comprises anchoring means (17) for said inlet valve (Vi).
 4. The packaging according to claim 1, 2 or 3, wherein said manipulation and fastening flap (14) takes the fashion of a covering sheet (114) adapted to shut in a substantially entire manner the top of said housing (6), arranged substantially parallel to said bottom (1 d) above said sack (S).
 5. The packaging according to claim 5, wherein at least one inspection door (124) is formed in said covering sheet (114).
 6. The packaging according to any of the previous claims, wherein said grip means (16) comprise one or more windows for the insertion of the hands of the worker.
 7. The packaging according to any of the previous claims, wherein said anchoring means for said outlet valve (Vu) and possibly said inlet valve (Vi) comprise shaped patterns (15, 17) comprising holes, cut or pre-cut lines on the respective sheets or flaps.
 8. The packaging according to any of the previous claims, wherein said fastening means comprise a tongue (18) foldably projecting from said manipulation and fastening sheet or flap (14, 114) and adapted to engage with engagement means (21) formed in a top front flap (3a) foldably extending from said front wall (1 a) of said body
(1) and with engagement means (19) formed in the same manipulation and fastening sheet or flap (14, 114).
 9. The packaging according to any of the previous claims, wherein said fastening means comprise a foldable edge (123, 223) adapted to be engaged with a rear wall (1 c) opposite said front wall (1 a) of said body.
 10. The packaging according to any of the previous claims, further comprising at least one stiffening sleeve (7, 8), made of cardboard, adapted to be inserted within said housing (6) for increasing the stiffness of the side walls.
 11. The packaging according to claims 9 and 10, wherein said foldable edge is tucked in between said rear wall (1 c) and said at least one stiffening sleeve (7, 8).
 12. The packaging according to any of the previous claims, wherein from at least one among said base sheet (12), said front sheet (13) and said manipulation and fastening sheet or flap (14), foldable flaps extend towards the inside of said housing (6), for strengthening the packaging at the corners and increasing the stability of the assembly.
 13. The packaging according to any of the claims from 8 to 12, wherein said body (1) comprises, in addition to said top front flap (3a), other top flaps (3b, 3c) foldably extending from respective other side walls (1b, 1c) of the body, key engagement means (4, 5) being provided for carrying out a mutual engagement between said top flaps (3a, 3b, 3c) to form a partial covering of the top of said housing (6).
 14. The packaging according to any of the previous claims, wherein said base sheet (12), said front sheet (13) and said manipulation and fastening sheet or flap (14, 114, 214) are mutually separated by twin folding or creasing lines, adapted to permit a book-like folding of the sheets, in a stocking arrangement when the sack (S) is empty, defining a volume which is suitable to contain the same sack and the relative outlet valve (Vu), locking means being further provided for making said stocking arrangement stable, said locking means being arranged between said manipulation and fastening sheet or flap and said base sheet (12).
 15. The packaging according to claim 14, wherein said locking means for making said stocking arrangement stable comprise said fastening tongue (18) cooperating with a slot (25) formed in said base sheet (12).
 16. The packaging according to claim 14, wherein said locking means for making said stocking arrangement stable comprise at least one tang (122, 222) formed in said base sheet (112, 212) cooperating with a slot (119, 219) of said manipulation and fastening flap (114, 214).

17. The packaging according to any of the previous claims, wherein on said base sheet (12) tying means (25) are formed for allowing string-like means (F) to be connected, said string-like means being adapted to be gripped from the outside of the packaging for assisting the rotation of the same base sheet (12) towards said front sheet (13), so as to squeeze said sack (S). 5
18. The packaging according to any of the previous claims, wherein at least said front sheet (113, 313) has side tabs (126, 326) that can be folded towards the inside of the housing for strengthening the packaging at the corners and increasing the stability of the assembly, at the same time realizing side supports that make the inside of the corners more regular, avoiding the formation of gaps that could cut said sack (S). 10 15
19. An assembly of a sack (S) made of plastic materials for containing liquids or the like and a cardboard support (10) realized and adapted be used in the packaging according to any of the previous claims. 20

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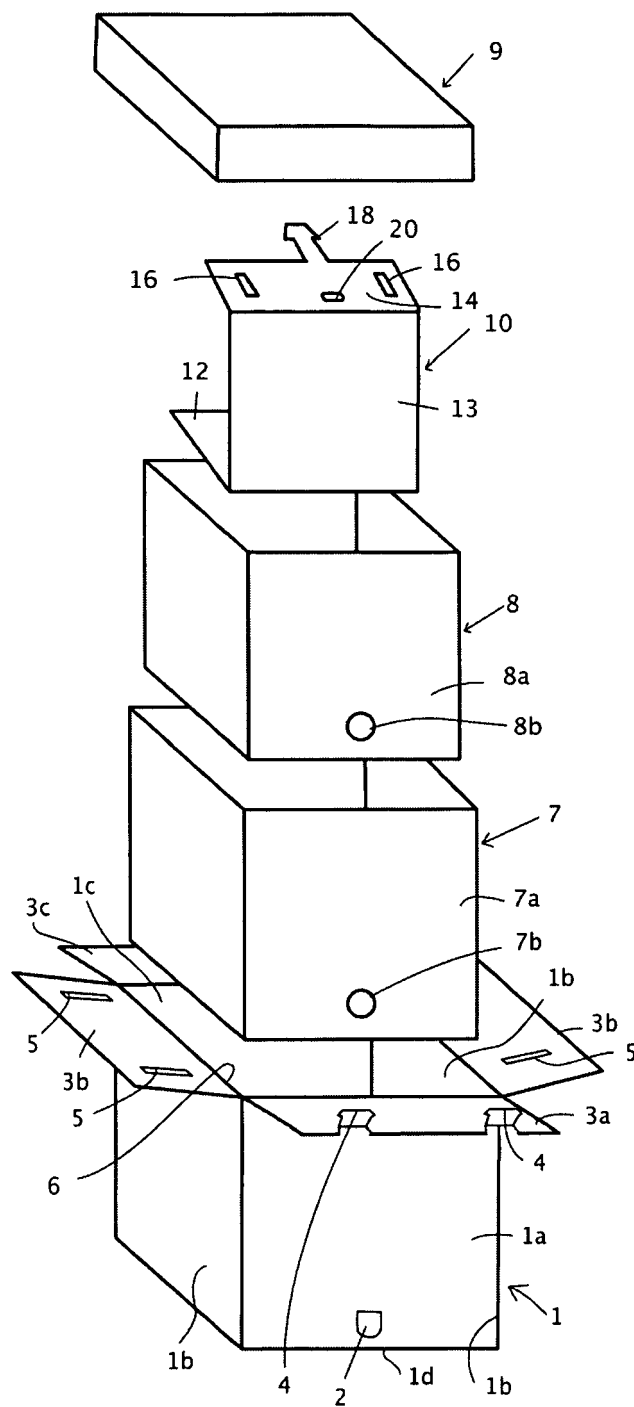


Fig. 1

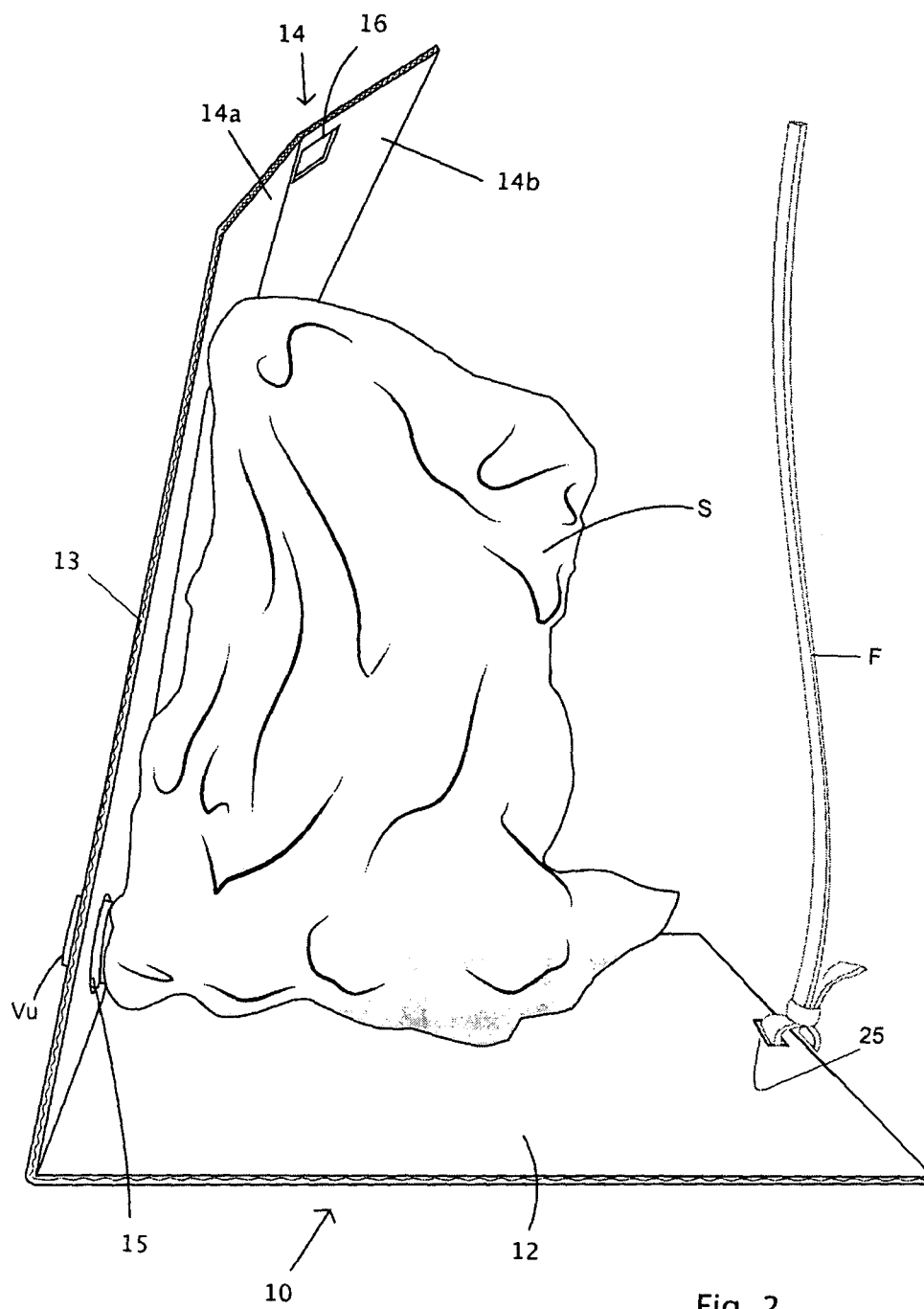
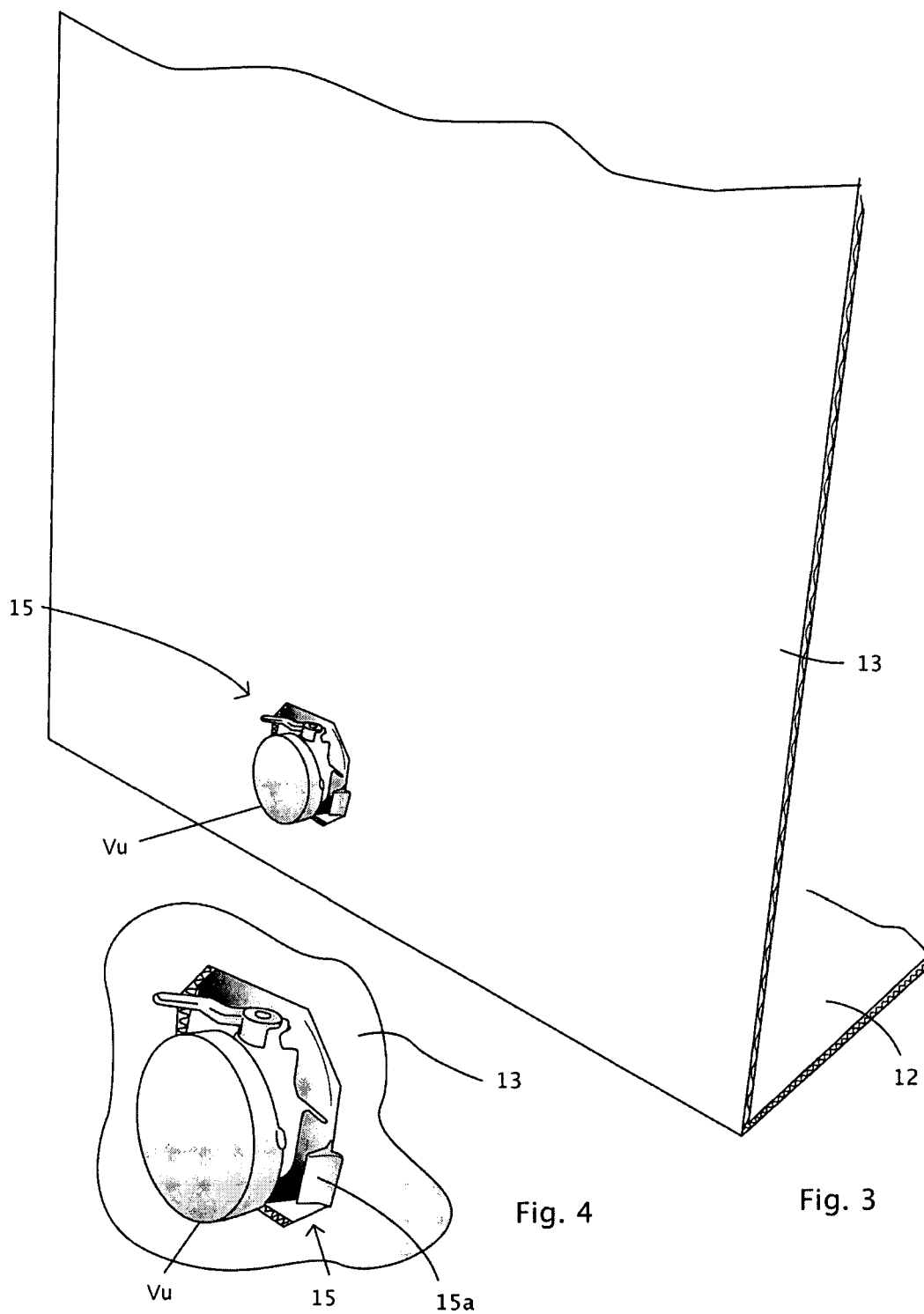
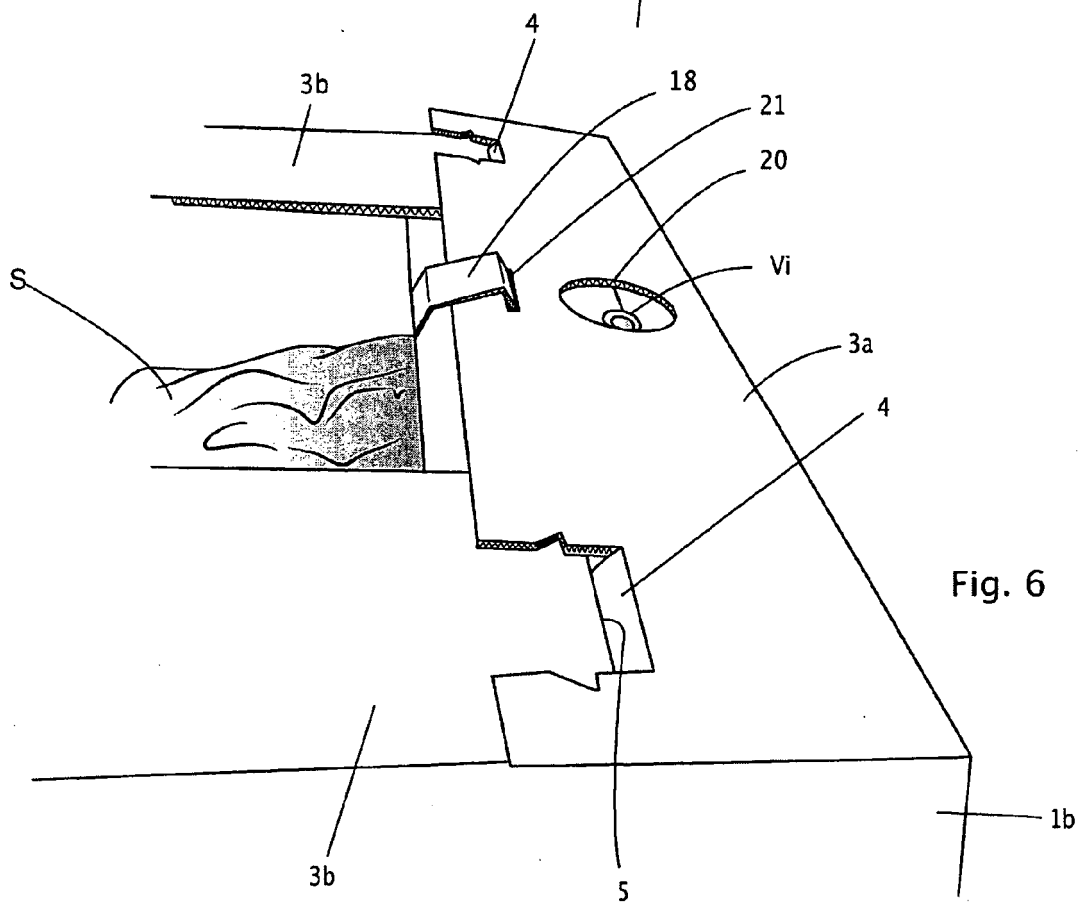
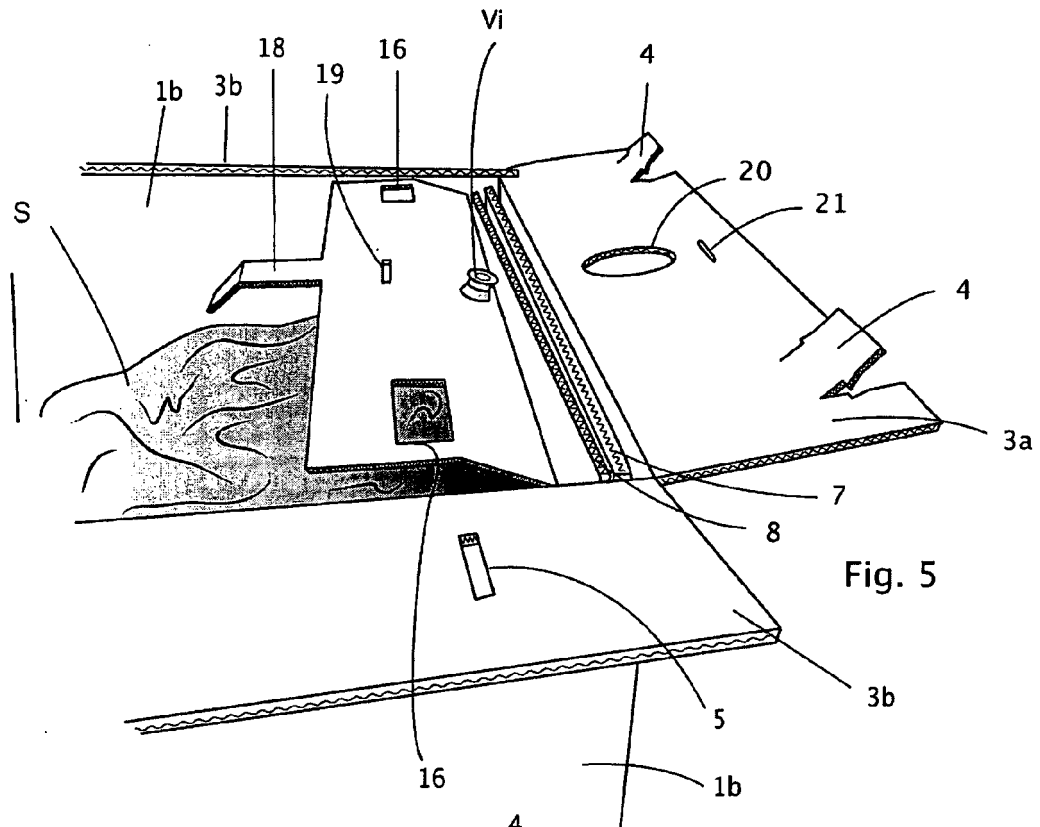


Fig. 2





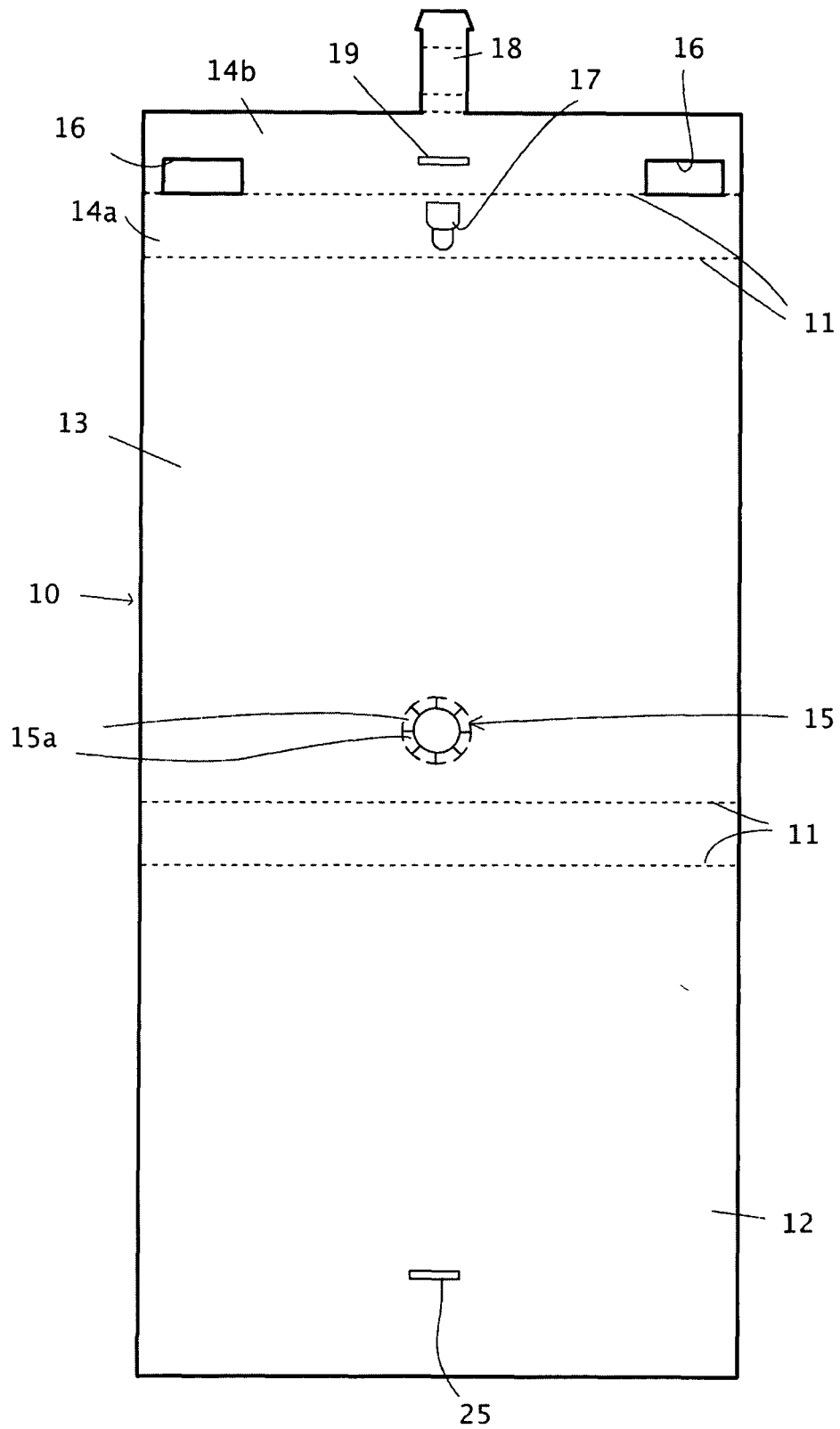


Fig. 7

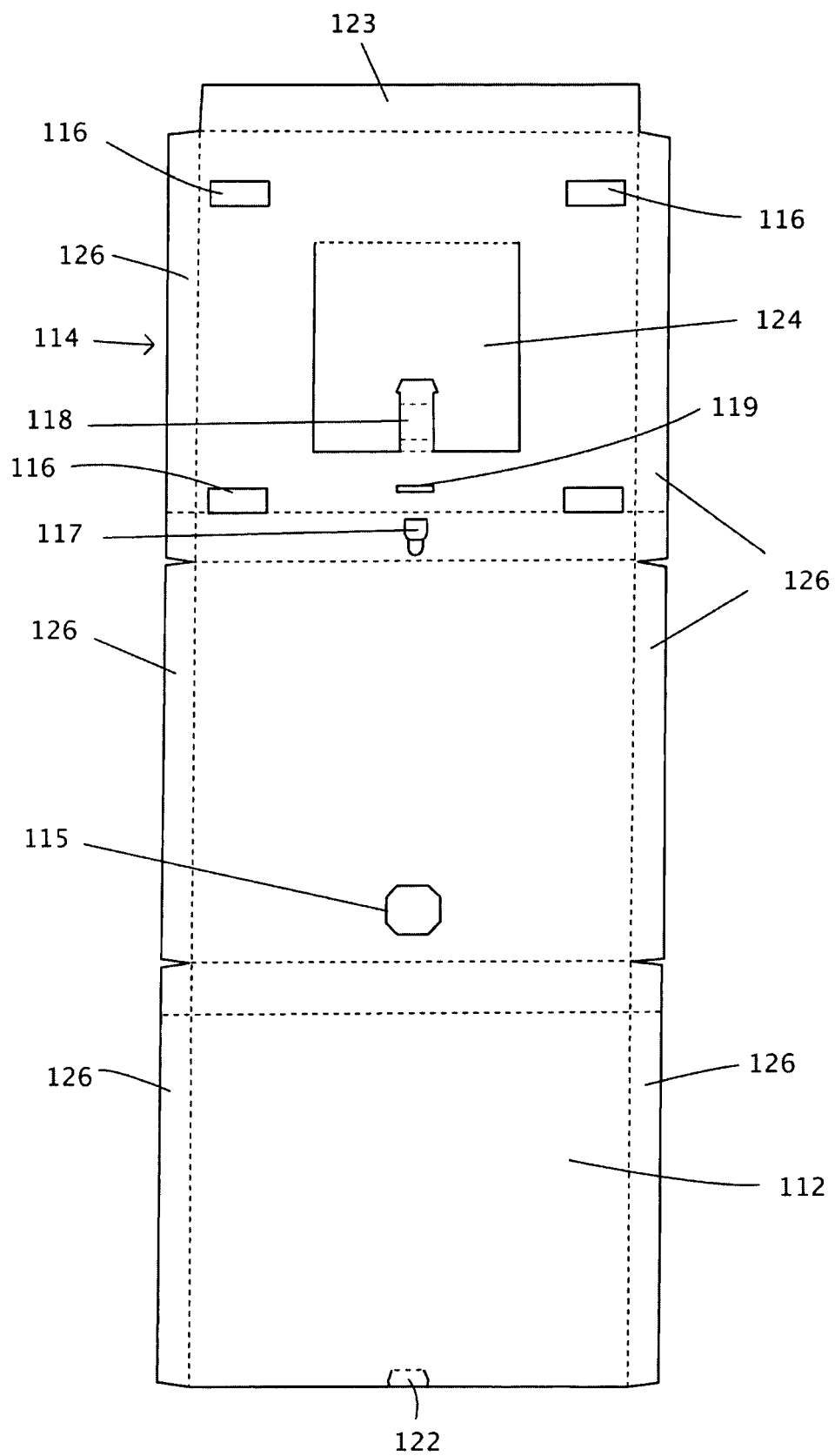


Fig. 8

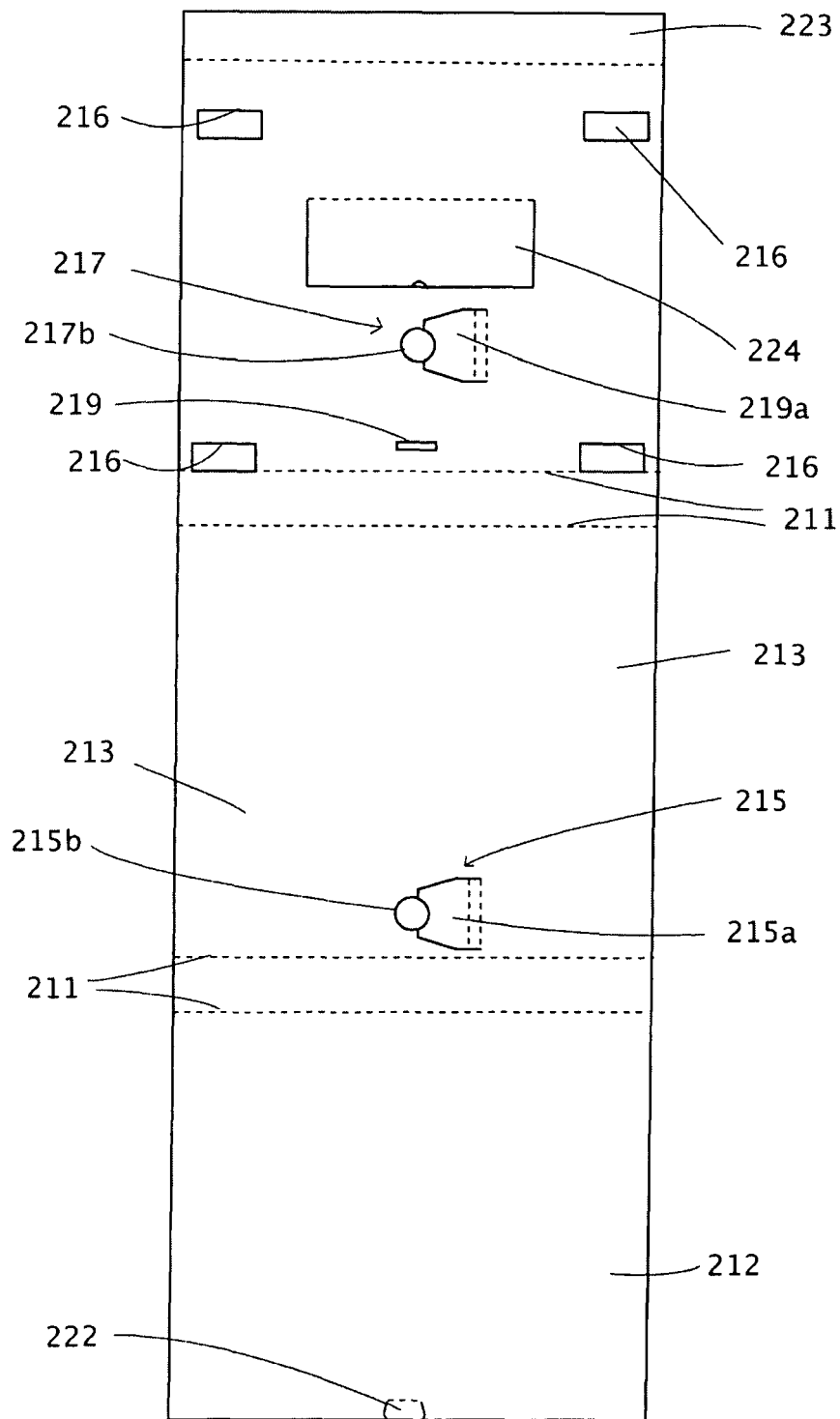


Fig. 9

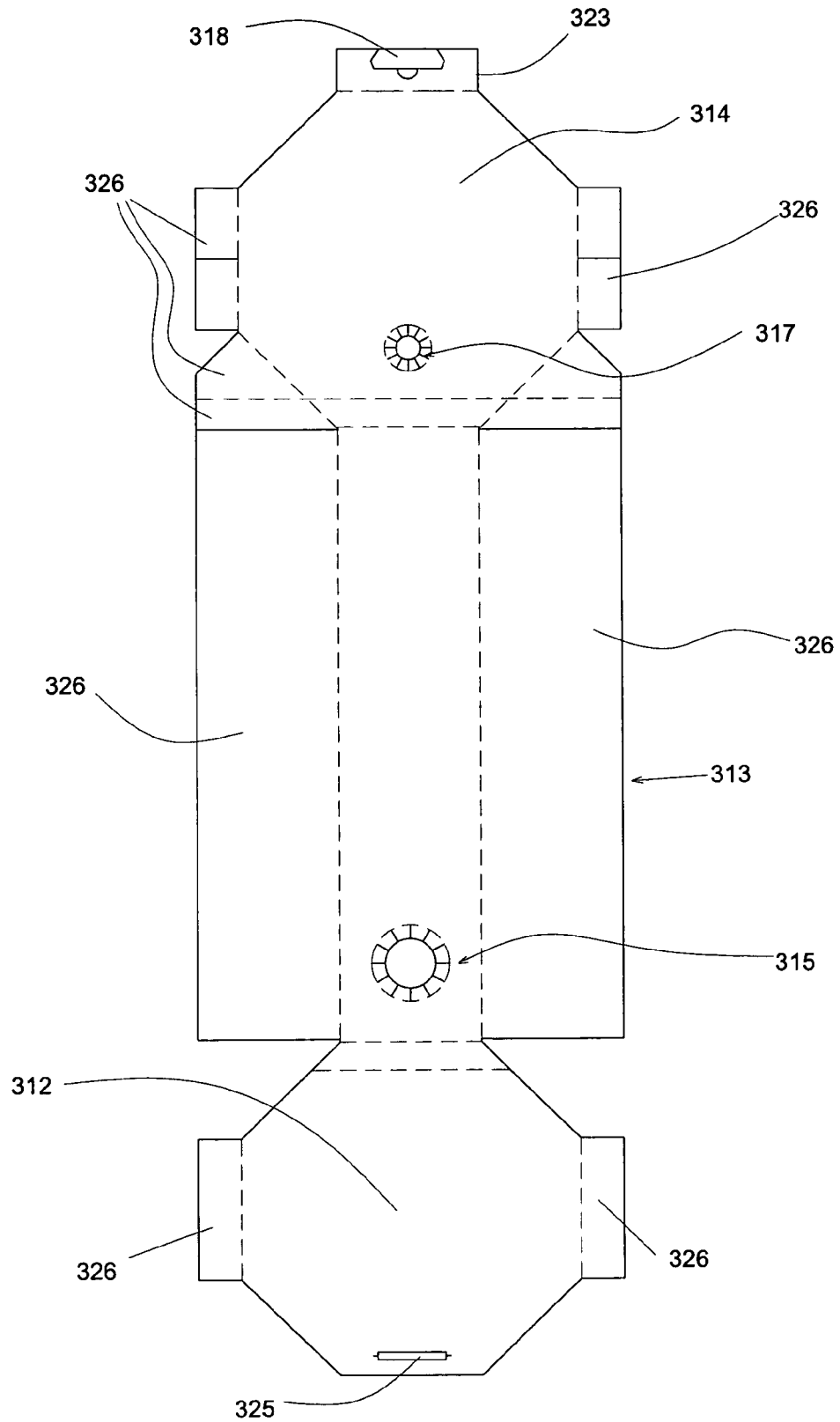


Fig. 10



EUROPEAN SEARCH REPORT

Application Number
EP 09 42 5271

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Place of search The Hague		Date of completion of the search 30 August 2010	Examiner Gino, Christophe
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 42 5271

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