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(54) **Package**

(57) The present invention relates to a flexible package comprising a front wall (12), a back wall, a front channel (5), a back channel, transverse seals (4), two flat draw strings (10, 11) within each channel, tacking seals (16, 17), detachable corner parts (8, 9), channel perforations (6, 7), string perforations, and a gusset. The strings are essentially parallel and in a face-to-face configuration, and they have been attached to the side edges (1, 2) of the package and by the tacking seals to the channels. When the detachable corner parts at the ends of the channels are grasped and pulled in opposite directions, the channel perforations and the string perforations are torn, the tightening parts (13) of the channels are bunched, and the package becomes closed. The present invention also relates to a pre-fabricated package, comprising said draw strings, in the form of a wicket package.

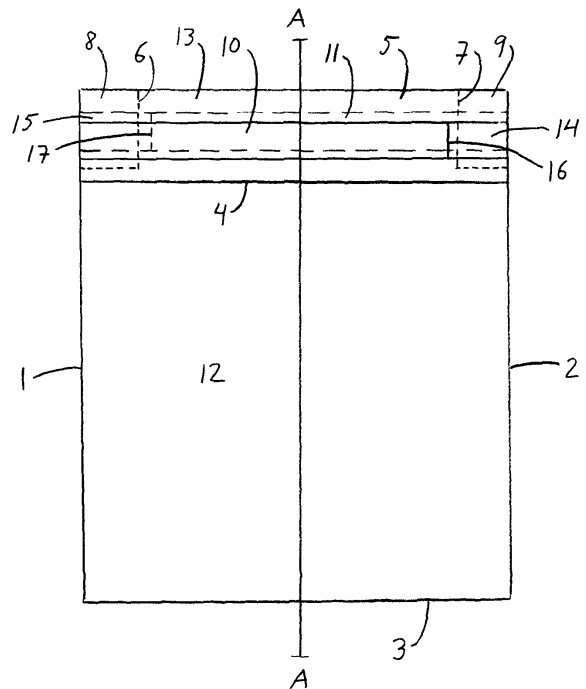


Fig. 1A

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Description

Field of the invention

[0001] The present invention relates to a flexible package, and more particularly to a flexible package comprising draw strings. The present invention also relates to a pre-fabricated package, comprising said draw strings, in the form of a wicket package.

Background of the invention

[0002] Flexible packages made of thin plastic film are commonly used in many different applications, such as for storing personal hygiene articles or food. These applications often require a mechanism for reclosing the package in a manner that holds the contents in place and enables easy reopening. Flat draw strings made of plastic film and encased in tubular channels around the top edge of the package can be applied for this purpose. The package can be closed either by pulling one or more strings in one direction and by bunching together the package opening by hand, or by pulling two or more strings in essentially opposite directions, whereby the package becomes closed.

[0003] In prior art it is known that a draw string package can be manufactured of plastic film, e.g. polyethylene, by joining the front wall and the back wall of the package by heat-sealing the side edges and the bottom edge, and by forming channels for plastic draw strings along the top edge of the package. Several different types of draw string packages have been described in prior art, mainly differing in the number of the strings and in the orientation and attachment of the strings with respect to each other and with respect to the channels encasing them.

[0004] Publication US 4,786,191 describes a draw string package comprising single strings (i.e. one string per channel), which are pulled at their ends in opposite directions to close the package. The attachment points of the strings are situated lower than the pulling points with respect to the top edge of the package, i.e. the strings are not completely horizontal. This package model provides exposed (i.e. uncovered, visible at channel openings) string ends at the opposite ends of separate channels for pulling.

[0005] Publication US 4,792,241 describes a dual string variant of the above-mentioned package. In this case, each channel encases two crossing strings, whereby none of the strings is completely horizontal. The package is closed by grasping the exposed string folds at the opposite ends of the channels and by pulling them in opposite directions.

[0006] Publication US 4,850,946 describes another dual string variant of the above-mentioned package, where closing the package involves grasping exposed string ends, although string folds are available as well, and pulling them in opposite directions. The string ends are located at the opposite ends of the same channel or

at the opposite ends of separate channels.

[0007] Publication US 3,738,567 describes a draw string package with dual offsetted strings, all string ends initially attached to the side edges and totally enclosed by the channels. Within each channel, there are two strings in an edge-to-edge configuration (mutually parallel but offsetted by one string width) and initially joined together by a line of partial separation. Here, all strings are entirely horizontal, i.e. parallel with the package top edge. Upon closing the package, the areas separated by perforations at the ends of the channels and concurrently the string ends are grasped and pulled apart.

[0008] In the packages according to the first three publications described above, the string ends and/or folds are vulnerable, since they are uncovered during manufacture and subsequent transport, which raises a possibility of their breakage, unwanted entangling and getting dirty before reaching the consumer. Also the preferred pulling mechanism of the package according to the publication US 4,850,946 is not unambiguous for the consumer, since both string ends and string folds are available and visible for pulling at the channel openings. The availability of loose string ends involves a risk of losing the ends of the strings inside the respective channel and thus impairing the reclosing function even during the normal usage of the package.

[0009] A disadvantage of draw string packages with crossing strings is that pulling force is not directed parallel to the top edge of the package but at a certain angle, since the secured ends of the strings are situated lower than the opposite ends that are exposed for pulling. Prior art packages featuring exposed string ends (in comparison to solutions with exposed string folds) for pulling also have the drawback that pulling is directed only to one of the two channels from each side and not to both of them, thus introducing unnecessary twisting upon pulling. Draw string packages with strings that are essentially parallel, horizontal, non-crossing, but offsetted by one string width also lead to asymmetry upon pulling due to said offsetting. Here it should be noted that in prior art packages with dual string closure mechanisms, the string arrangement always involves either lowering one end of each string with respect to its other end (crossing strings), or offsetting the strings inside the same channel by one string width with respect to each other to provide an edge-to-edge configuration.

[0010] The present invention provides an improved dual draw string package with such a string arrangement and with such a string attachment mechanism, which ensure that the strings remain entirely protected during the manufacture of the package, during the filling of the package with items, and during the transport of the package. The present invention also ensures that the draw strings are protected while the package is being handled in retail shops and by end-users, up to the point where it is desired to use the strings e.g. for reclosing or hanging the package.

[0011] The package according to the present invention

comprises a more effective dual draw string closure mechanism with easy and symmetrical pulling of the strings. In the package according to the present invention, the strings are essentially parallel to the package top edge, pulling is directed simultaneously to both channels from both sides of the package, and the strings and the channels are essentially in a face-to-face configuration (in comparison to the crossing and/or edge-to-edge string solutions presented in prior art). The draw strings according to the present invention are flat and they are made of essentially the same plastic material as the package itself.

[0012] The package according to the present invention is provided e.g. for storing personal hygiene articles or food. Draw string packages with flat strings have not yet been introduced on the market for this type of goods. Flat strings offer many advantages in this field in comparison to packages without any strings or with thin cotton strings. First, flat draw strings made of plastic film can be incorporated into the channels at an early manufacturing stage as they do not interfere with heat-sealing as cotton strings would do. Due to the facilitated processing and manufacturing of the package and the strings, the production costs of the package will be reduced. Plastic flat strings also enable the design of sophisticated closure mechanisms, since their attachment by the well-known heat-sealing technique is straightforward and reliable. Also, draw strings can serve as a means to add unique appearance to the product.

[0013] From a consumer's point of view, it is often desirable to reclose a package containing toiletries or food items. Draw strings can also serve as a means to hang the package at a suitable location, e.g. on a hook at its site of usage. Especially, it is convenient that the walls, the channels, and the draw strings of the package are made of essentially the same material, implicating that the end-user can recycle the empty package as such, without separating the strings.

[0014] The package with flat draw strings according to the present invention accomplishes the above-mentioned tasks effectively, and the present invention thus introduces an improvement to the conventional toiletry and food packages on the market, which comprise no draw strings at all or only thin cotton strings, and to the draw string packages of prior art. The package according to the present invention may be useful also for other purposes not mentioned in this description.

Brief description of the invention

[0015] The present invention relates to a package comprising

a front wall and a back wall of flexible sheet material, joined to each other along a first side edge, a second side edge, and a bottom edge;

a first transverse seal extending from the first side

edge to the second side edge, adapted to define a front channel of flexible sheet material above said front wall;

5 a second transverse seal extending from the first side edge to the second side edge, adapted to define a back channel of flexible sheet material above said back wall;

10 a gusset of flexible sheet material, said gusset connected to said transverse seals along their entire length;

15 a storage volume defined by said front wall, said back wall and said gusset;

20 a detachable corner part at both ends of each of said channels, adapted to be torn off along a channel perforation;

25 a first string and a second string of flexible sheet material inside each of said channels, each string extending through the respective channel, one end of each string attached to the first side edge, and the other end of each string attached to the second side edge, said strings being adapted to be pulled by detaching said detachable corner parts;

30 at least one perforation enabling access to said storage volume.

[0016] In particular, the package according to the present invention is characterized by the features specified in the characterizing part of claim 1.

35 **[0017]** Thus, said channel perforations are adapted to divide each of said channels to said detachable corner parts and to a tightening part; said first string and said second string are essentially in a face-to-face relationship with respect to each other inside the channel;

40 each of said strings comprises a string perforation that is essentially in line with and parallel to one of the channel perforations of the respective channel, said string perforation extending across the width of the respective string, and adapted to define a detachable string end;

45 said package further comprises a tacking seal essentially adjacent to each of said string perforations within the tightening part, said tacking seal adapted to attach the string to the respective tightening part, the tacking seal and the string perforation of the first string being at the opposite end of the tightening part as compared to the tacking seal and the string perforation of the second string in each channel.

50 **[0018]** According to the preferred embodiment of the present invention, said at least one perforation enabling access to said storage volume (32) is a gusset perforation (29) within said gusset (28).

[0019] According to the preferred embodiment of the

present invention, said flexible sheet material is polyolefin, preferably polyethylene.

[0020] The present invention also relates to a pre-fabricated package, comprising said draw strings, in the form of a wicket package, wherein the bottom edge is open, and further comprising a means to hang said pre-fabricated package from its bottom edge to be used, for example, in automatic packaging machines.

[0021] The present invention also relates to the use of said package for storing personal hygiene articles or food.

Brief description of the drawings

[0022]

Figures 1A-1C show two-dimensional front-views of the package according to an embodiment of the invention. Figure 1A shows the package before use, Figure 1B shows the detachment of the corners and Figure 1C shows the package in a closed configuration with the detachable corner parts pulled apart.

Figure 2 shows a cross-section along the line A-A in Fig. 1A. The front and back walls are not drawn in their entire height to emphasize the structure of the channels.

Figure 3 shows a three-dimensional tilted side-view of the package according to an embodiment of the invention with the corner detached.

Figure 4 shows a top-view of the package according to an embodiment of the invention.

Detailed description of the invention

[0023] Figure 1A shows a two-dimensional front-view of the package according to an embodiment of the present invention, said package comprising a front wall (12) and a back wall (18, not shown in this figure), joined together by heat-sealing along a first side edge (1), a second side edge (2) and a bottom edge (3). The package further comprises a first transverse seal (4) and a second transverse seal (19, not shown in this figure), each extending from the first side edge (1) to the second side edge (2) and dividing the package to a storage volume (32, not shown in this figure) below said transverse seals (4; 19) and to a front channel (5) and a back channel (22, not shown in this figure) above said transverse seals. Thus said channels (5; 22) are located above the respective walls along their total width. The first transverse seal (4) separates the front wall (12) and the front channel (5) from each other. The heat-sealed side edges (1, 2) join the front channel and the back channel from their ends, in addition to joining the front wall and the back wall from their sides.

[0024] The discussion hereafter regarding Figures 1A-

1C concentrates only on the front side of the package (the front wall (12), the front channel (5) and other parts therein), but, as is evident, the structure of the package is symmetrical and includes corresponding parts in the back side.

[0025] Referring still to Fig. 1A, the package further comprises detachable corner parts (8, 9) at the opposite ends of the front channel (5), adapted to be torn off along channel perforations (6, 7), and a first string (10) and a second string (11) essentially in a face-to-face relationship with respect to each other (in Figures the strings are facing each other only partly for illustrative purposes) inside the front channel (5). Said channel perforations (6, 7) are adapted to divide the front channel (5) to the detachable corner parts (8, 9) for pulling and to a tightening part (13) that is adapted to remain attached to the front wall (12) via the first transverse seal (4) upon pulling. It should be noted, that said channel perforations (6, 7) and said detachable corner parts (8, 9) extend from the front channel to the back channel via the side edges (1, 2).

[0026] In the context of the present invention, the term "perforation" refers to a locally weakened (mechanically or otherwise), curved or straight line in the package material, which enables the material to be torn along said line. Suitable techniques for achieving locally weakened lines are apparent to a person skilled in the art.

[0027] Both strings (10, 11) within the front channel (5) have been attached from their ends to the first side edge (1) and to the second side edge (2). Additionally the first string (10) has been heat-sealed by a first tacking seal (16) to the front side (24, not shown in this figure) of the front channel (5) within the tightening part (13) adjacent to the first channel perforation (7). The second string (11) has been heat-sealed by a second tacking seal (17) to the back side (25, not shown in this figure) of the front channel (5) within the tightening part (13) close to the second channel perforation (6). Each string (10, 11) comprises a string perforation (not shown) adjacent to the respective tacking seal (16, 17) essentially in line with the respective channel perforation (7, 6) for detaching a string end (14, 15) together with the respective corner part (9, 8).

[0028] It is apparent to a person skilled in the art that the string perforations, the channel perforations and the tacking seals must be situated with respect to each other in such a way that one end of each string remains attached to the respective tightening part even after detaching the corner parts (8, 9) together with the string ends (15, 14). More particularly, each of the tacking seals (16, 17) will attach one string to the respective tightening part (13), and there will be a string perforation adjacent to said tacking seal and in line with a channel perforation (7, 6).

[0029] An analogous description as above applies for the back wall (18) and the back channel (22), and the strings, the perforations and the seals therein.

[0030] Figure 1B shows the package of Fig. 1A but with the corner parts (8, 9) and the string ends (15, 14)

detached. At this stage both strings (10, 11) have been partly exposed, i.e. they are no longer entirely encased and protected by the front channel (5). The first string (10) is secured by the first side edge (1) and the first tacking seal (16), and the second string (11) is secured by the second side edge (2) and the second tacking seal (17).

[0031] Figure 1C shows the package of Fig. 1A with the corner parts (8, 9) pulled apart and the tightening part (13) bunched together to close the package. From this configuration it is possible to return to the open configuration of Fig. 1A or 1B by straightening the tightening parts (13; 23, latter not shown in this figure).

[0032] Figure 2 shows a cross-section taken along the line A-A in Fig. 1A. The front channel (5) and the back channel (22) are comprised of folded sheet material, which has been heat-sealed along the transverse seals (4; 19), and adapted to leave a gusset (28) between the two channels (5; 22). Said transverse seals are thus adapted to divide the package to the storage volume (32) and to two channels (5; 22). Each of said channels (5; 22) consists of a front side (24; 26) and a back side (25; 27) and hosts two strings (10, 11; 20, 21) that are essentially in a face-to-face relationship with respect to each other.

[0033] Figure 3 shows a three-dimensional tilted side-view of the package according to an embodiment of the present invention. The ends of the upper (i.e. closer to the front side of the respective channel) strings (10; 20, solid line) have been attached to the first side edge (1). The detachable string ends (15; 30) of the lower strings (11; 21, dashed line) have been detached together with the first detachable corner part (8). Each of the lower strings (11; 21) has been heat-sealed along the second tacking seal (17; 31) to the back side (25; 27) of the respective tightening part (13; 23). Correspondingly each of the upper strings (10; 20) has been heat-sealed along the first tacking seal (not shown in this figure) to the front side (24; 26) of the respective tightening part (13; 23) at its opposite end (not shown in this figure).

[0034] Figure 4 shows a top-view of the package according to the preferred embodiment of the present invention. The package comprises a gusset (28) of flexible sheet material, which is connected to said transverse seals (4; 19) along their entire length. According to this embodiment, said gusset (28) contains a gusset perforation (29). Preferably the gusset perforation is line-shaped and extends essentially from the first side edge (1) to the second side edge (2), but it can be of any other suitable shape and length as well. By tearing open the gusset perforation it is possible to open the package for taking out items.

[0035] When it is desired to use the strings of the package, e.g. for closing the package, the detachable corner parts (8, 9) are grasped, for example by a thumb and a forefinger, and pulled laterally, causing the corner parts and concomitantly the detachable string ends to become separated from the tightening parts (13; 23) of the chan-

nels (5; 22), whereby the tightening parts tighten and bunch, and the package becomes closed.

[0036] The package according to the present invention comprises one or more perforations enabling access to the storage volume and to the contents of the package. These perforations may be placed, for example, within the front wall or within the back wall or within the gusset, and they may be of any suitable shape, e.g. line-shaped, broken line-shaped, circular, elliptical or square. Regarding the placement of said perforations, three functional embodiments can be envisaged easily, although other embodiments are within the scope of the present invention as well. According to the first embodiment, the package comprises a gusset perforation (29) within the gusset (28). According to the second embodiment, the package comprises one or more perforations within the front wall and/or the back wall, and a gusset perforation (29) within the gusset (28). According to the third embodiment, the package comprises one or more perforations within the front wall and/or the back wall. Said first embodiment is the most preferred embodiment, since it allows the consumer to tear open the package, to take out (or to insert) items easily through the gusset and subsequently to re-close the opened package effectively by pulling the draw strings.

[0037] The package according to the present invention is formed from any suitable flexible sheet material, which can vary depending on the actual application of the invention at issue. The flexible sheet material of the walls, the channels and the gusset can be, for example, polyolefin or plastic sheet laminate, preferably it is polyethylene or polypropylene, and most preferably polyethylene. The thickness of the flexible sheet material of the walls, the channels and the gusset is preferably 20-100 μm , more preferably 30-100 μm , and most preferably 30-50 μm .

[0038] The appropriate dimensions of the front wall (12), the back wall (18), the gusset (28) and the channels (5; 22) can be easily estimated by a person skilled in the art depending on the actual application of the invention at issue. The width of the walls (i.e. the distance from the first side edge to the second side edge) is preferably 50-600 mm. The height of the walls (i.e. the distance from the bottom edge to the transverse seal) is preferably 100-600 mm. The height of the channels is preferably 7-40 mm. The length of the channels is essentially the same as the width of the walls. The respective dimensions of the front wall and the back wall are essentially the same to provide a symmetrical package structure. Also the respective dimensions of the front channel and the back channel are essentially the same.

[0039] The strings (10, 11; 20, 21) are formed from any suitable flexible sheet material, which can vary depending on the actual application of the invention at issue. The flexible sheet material of the strings can be, for example, polyolefin, preferably it is polyethylene. The strings are essentially flat, i.e. their width is significantly larger than their thickness. The appropriate aspect ratio

(i.e. the ratio of the string width to the string thickness) can be easily estimated by a person skilled in the art. The width of the strings is preferably 5-30 mm. However, a person skilled in the art will understand that the width of the strings should be so small that the strings will fit into the channels and at the same time large enough to allow the strings to be effectively heat-sealed and to be pulled without any damage or breakage. The thickness of the flexible sheet material of the strings is preferably 50-150 μm , more preferably 50-120 μm , and most preferably 60-100 μm . The length of the strings is essentially the same as the length of the channels and the width of the walls.

[0040] The appropriate size and shape of the detachable corner parts (8, 9) can be easily estimated by a person skilled in the art depending on the actual application of the invention at issue. Preferably, the detachable corner parts should be large enough to accommodate the string ends and to enable easy grasping, for example by a thumb and a forefinger, but at the same time small enough to leave a reasonable length of the channel for the tightening part. Consequently, the length of the detachable string ends as defined by the string perforations is preferably essentially of the same magnitude as the distance from the respective side edge to the respective channel perforation. More preferably, the length of the detachable string ends is the same as the distance from the respective side edge to the respective channel perforation.

[0041] The invention also relates to a pre-fabricated package in the form of a wicket package. Said pre-fabricated package comprises the walls, the channels, the draw string mechanism (i.e. the strings, the string perforations, the channel perforations and the tacking seals) and the gusset, which have been arranged and joined to each other as described above, except that the front wall (12) and the back wall (18) have not been joined together along the bottom edge (3) (i.e. the bottom edge is open), and the pre-fabricated package additionally comprises a means to hang said pre-fabricated package from its bottom edge. Preferably said means to hang is provided by increasing the height of the front wall beyond the height of the back wall (or vice versa) to form a lap at the bottom edge of the front wall (or the back wall), and by forming one or more openings within said lap for hanging the wicket package.

[0042] The wicket package according to the present invention can be, for example, filled automatically by packaging machines that are used in the art. Usually such automated filling comprises hanging the wicket package at the packaging machine, inserting the contents, and heat-sealing the bottom edge.

[0043] A person skilled in the art will understand that the embodiments and the uses of the present invention and the package materials and the dimensions presented above are not intended to be in any way limiting. Other possible embodiments, uses, package materials and dimensions are within the scope of the present invention

as well.

Claims

1. A package comprising

a front wall (12) and a back wall (18) of flexible sheet material, joined to each other along a first side edge (1), a second side edge (2), and a bottom edge (3);

a first transverse seal (4) extending from the first side edge (1) to the second side edge (2), adapted to define a front channel (5) of flexible sheet material above said front wall (12);

a second transverse seal (19) extending from the first side edge (1) to the second side edge (2), adapted to define a back channel (22) of flexible sheet material above said back wall (18); a gusset (28) of flexible sheet material, said gusset connected to said transverse seals (4; 19) along their entire length;

a storage volume (32) defined by said front wall (12), said back wall (18) and said gusset (28);

a detachable corner part (8, 9) at both ends of each of said channels (5; 22), adapted to be torn off along a channel perforation (6, 7);

a first string and a second string (10, 11; 20, 21) of flexible sheet material inside each of said channels (5; 22), each string extending through the respective channel, one end of each string attached to the first side edge (1), and the other end of each string attached to the second side edge (2), said strings being adapted to be pulled by detaching said detachable corner parts;

at least one perforation enabling access to said storage volume (32);

characterized in that:

said channel perforations (6, 7) are adapted to divide each of said channels (5; 22) to said detachable corner parts (8, 9) and to a tightening part (13; 23);

said first string (10; 20) and said second string (11; 21) are essentially in a face-to-face relationship with respect to each other inside the channel;

each of said strings (10, 11; 20, 21) comprising a string perforation that is essentially in line with and parallel to one of the channel perforations of the respective channel, said string perforation extending across the width of the respective string, and adapted to define a detachable string end (14, 15; 30);

said package further comprising a tacking seal (16, 17; 31) essentially adjacent to each of said string perforations within the tightening part (13;

23), said tacking seal adapted to attach the string (10, 11; 20, 21) to the respective tightening part, the tacking seal and the string perforation of the first string being at the opposite end of the tightening part as compared to the tacking seal and the string perforation of the second string in each channel. 5

2. A package according to claim 1, wherein said at least one perforation enabling access to said storage volume (32) is a gusset perforation (29) within said gusset (28). 10
3. A package according to claim 1 or claim 2, wherein said flexible sheet material is polyolefin, preferably polyethylene. 15
4. A pre-fabricated package according to any of claims 1-3 in the form of a wicket package, wherein the bottom edge is open, and further comprising a means to hang said pre-fabricated package from its bottom edge. 20
5. Use of a package according to any of claims 1-3 for storing personal hygiene articles or food. 25

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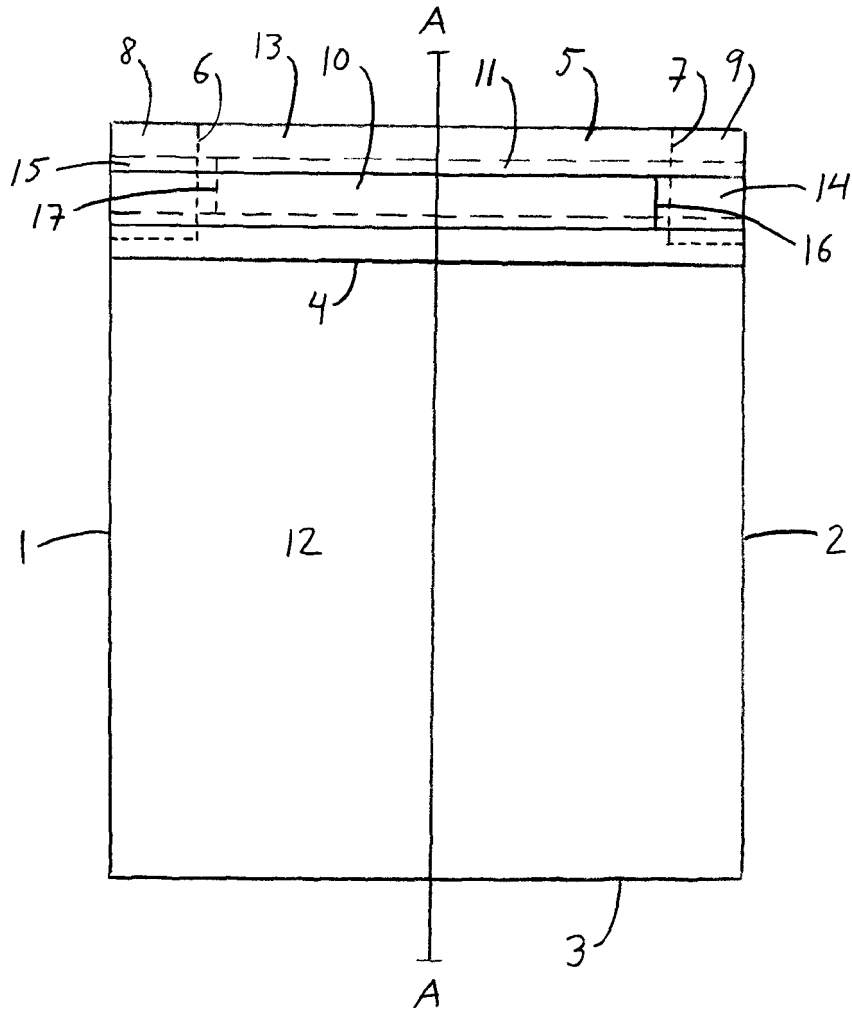


Fig. 1A

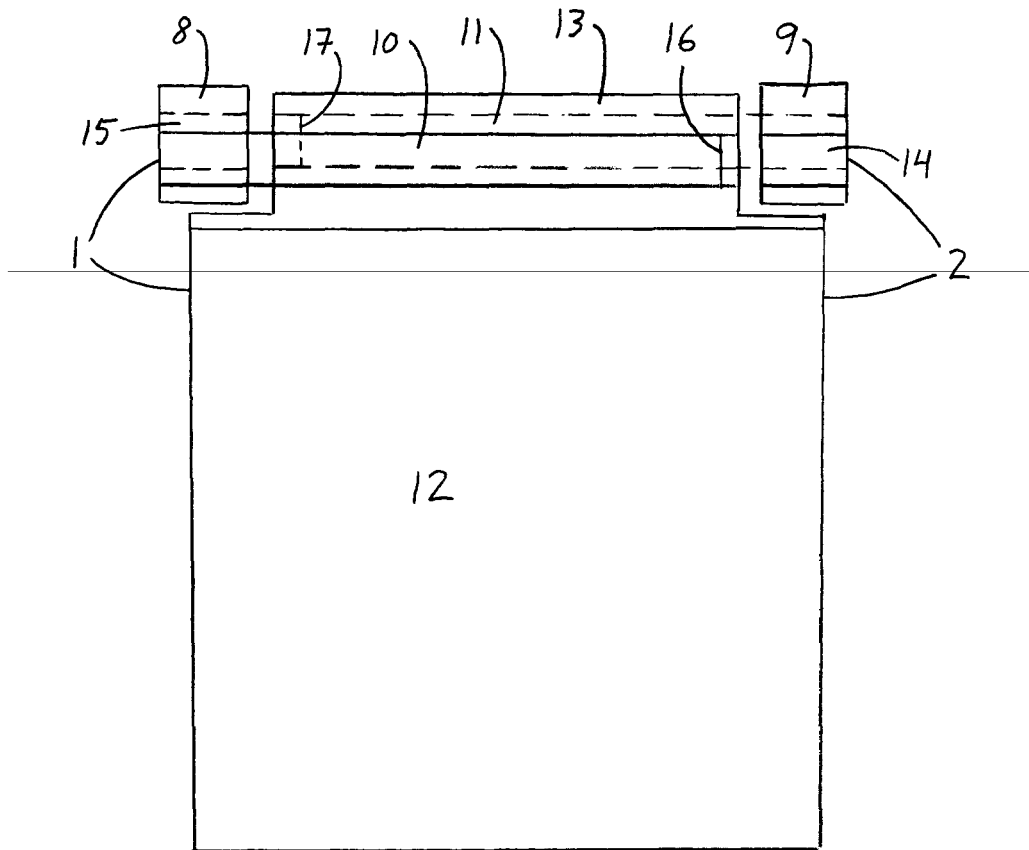


Fig. 1B

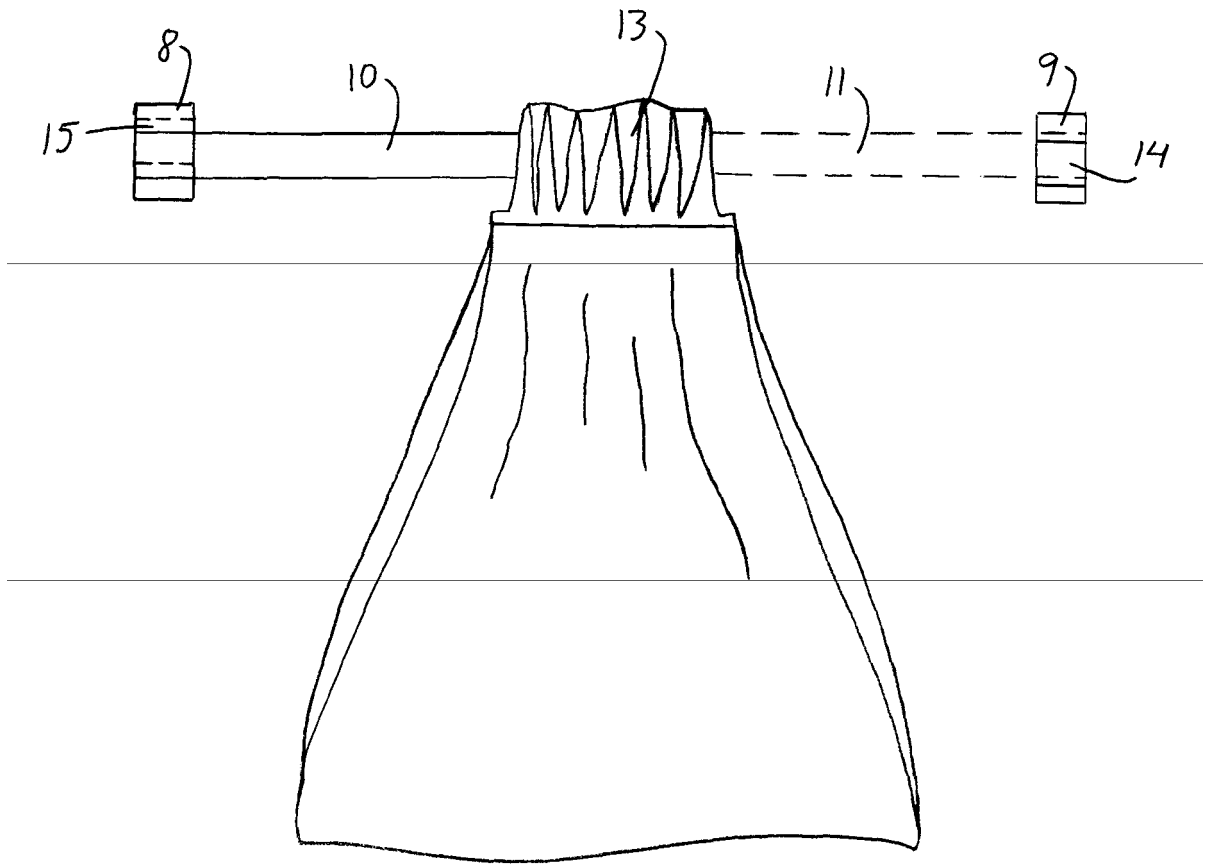
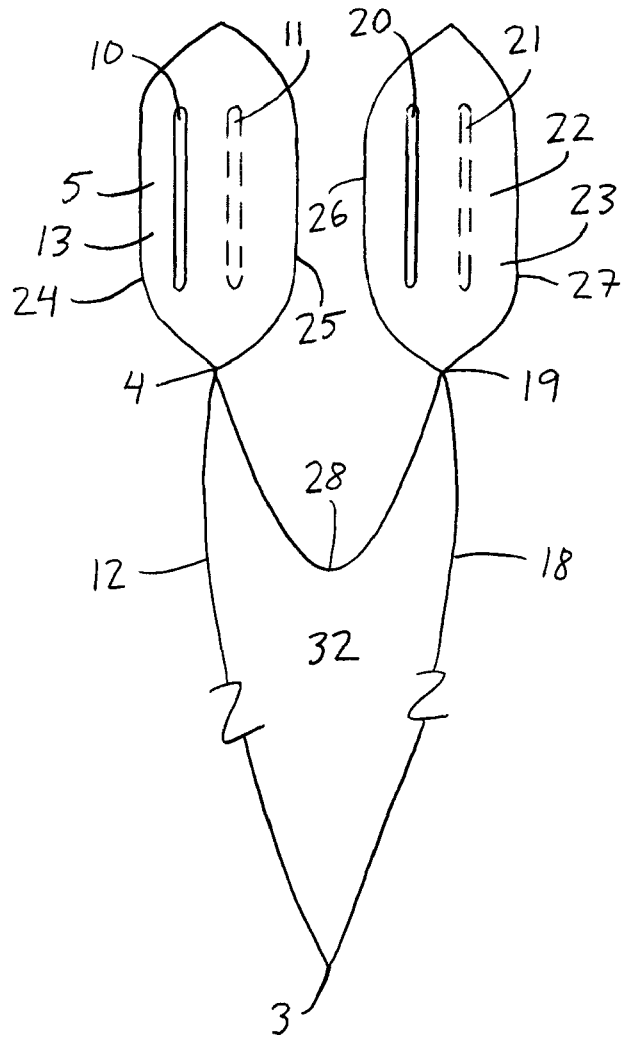


Fig. 1C



cross-section A - A

Fig. 2

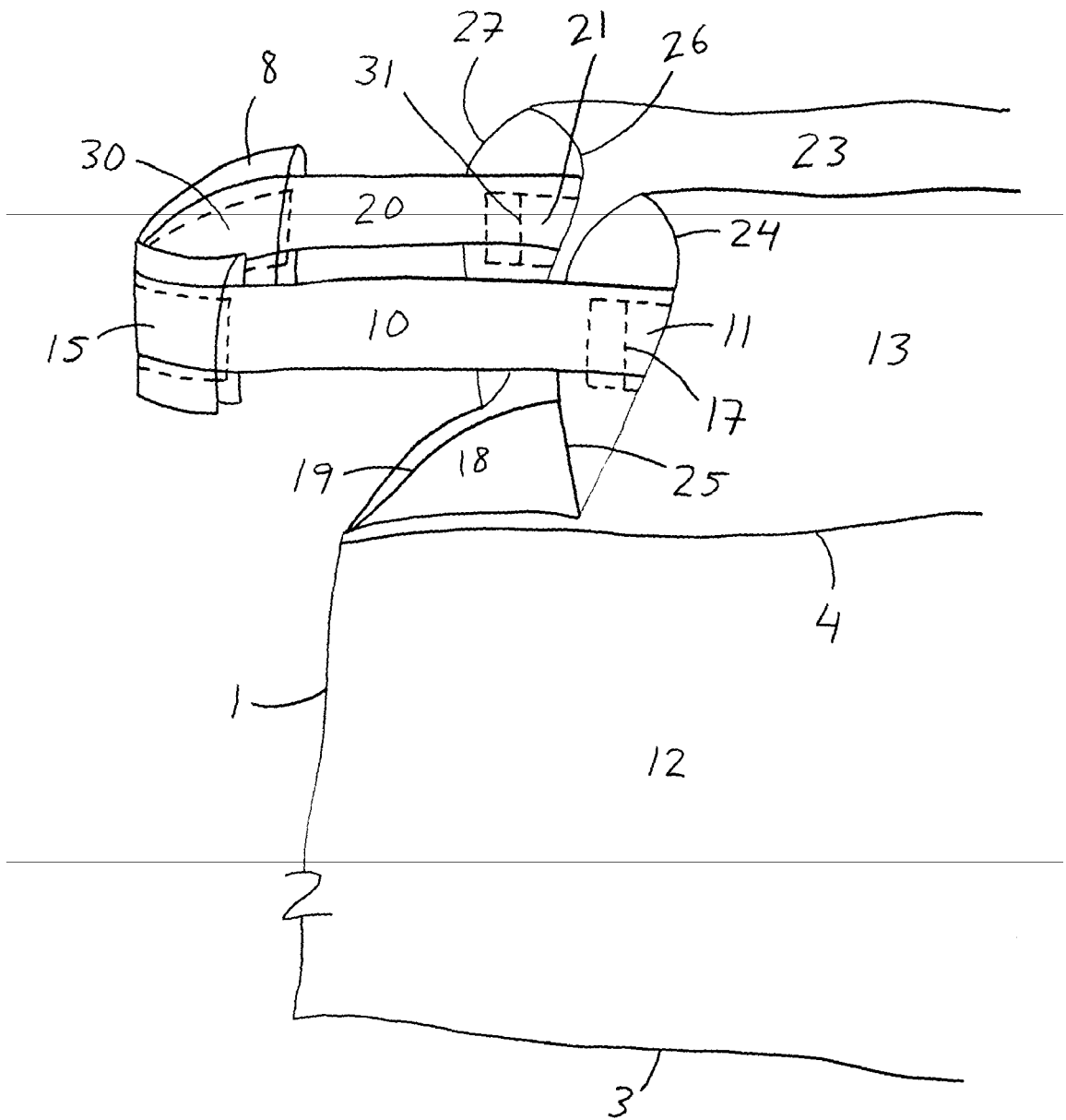


Fig. 3



EUROPEAN SEARCH REPORT

Application Number
EP 08 39 7524

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 203 04 188 U1 (PELZ & CO KG W [DE]) 5 June 2003 (2003-06-05) * claims; figures * -----	1,3	INV. B65D33/28
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
1	Place of search The Hague	Date of completion of the search 10 March 2009	Examiner Jagusiak, Antony
CATEGORY OF CITED DOCUMENTS		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	
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			

EPO FORM 1503 03/02 (P04C01)

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

EP 08 39 7524

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10-03-2009

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