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(12) # EUROPEAN PATENT SPECIFICATION

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(54) **Liquid storage bag.**

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FR-A- 1 290 641
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GB-A- 1 595 227

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Description

This invention relates to a storage bag which is particularly suitable for transportation in a container. The bag of the invention will mainly find application in the storage of liquids, but is not limited to such application.

Conventionally when liquid storage bags are housed within ISO containers, a bulkhead / pallet is provided with the bulkhead disposed adjacent to and supported by the doors of the container, such bulkhead / pallet serving to prevent the bag from bulging out of the container during filling and discharge operations. It will be appreciated that such a bulkhead / pallet arrangement adds weight to a load, and is also space consuming particularly in relation to an empty storage bag.

DE-A-3 123 150 discloses a rectangular storage container formed from a tube of flexible material by stitching a seam diametrically across the tube, flattening the seam onto material in the tube so that opposed ear formations project upwardly, and folding these ear formations flat onto the seam. One ear formation is folded back on itself to provide a spout.

FR-A-2 351 855 discloses a harness to support a non-rigid container against movement, comprising a number of spaced flexible steps, and anchoring straps to hold the harness in fixed relation to a support means.

It is an object of the present invention to provide a novel storage bag and accessories therefor which it is believed will overcome or at least minimise the difficulties mentioned above.

The storage bag and the method of forming said bag are defined by the features of the independent claims. The storage bag is made of flexible sheet material. It is of generally rectangular configuration, comprising a generally planar base section, opposed generally vertically disposed side wall sections, opposed generally vertically disposed end wall sections, and a generally planar roof section. The term "generally vertically wall section" herein is meant to include an upwardly directed slanting wall section.

In a preferred arrangement the bag will comprise a tubular section defining the base side walls and roof, with rectangular end wall sections being secured to each end of the tubular section. The end wall sections will be constituted by two sections which fold towards one another from the side wall sections or alternatively from the roof and base sections.

In one arrangement where the side wall sections and end wall sections are substantially vertically disposed, the end wall sections will be constituted by two half sections of substantially equal size. Alternatively, where the side wall and the end wall sections either converge or diverge upwardly, the end wall sections will be constituent by unequal sections.

Where the bag is housed in a rigid container, it may further include a reinforcing harness comprising a plurality of strap elements whereof the free ends are adapted to be secured to the container, preferably to the floor thereof. In a preferred embodiment, the reinforcing harness will include two or more longitudinal straps extending over the end sections and the roof of the bag, and one or more transverse straps extending over the side wall sections and the roof of the bag. Preferably two longitudinal straps will be provided, the straps diverging outwardly at the end panels towards the lower bottom corners of the bag. With the latter arrangement a series of cross-brace straps will preferably be provided to link the outwardly diverging straps together at intervals at one or both end zones thereof.

Also included within the scope of the invention is a blank of elastomeric or plastic sheet material which may or may not be reinforced with fabric for forming the bag of the invention, as disclosed herein.

In order to illustrate the invention two embodiments thereof will be described hereunder purely by way of example with reference to the accompanying drawings wherein:

- Figure 1 is a schematic perspective view of a storage bag in accordance with the invention positioned within a container;
- Figure 2 is a perspective view of a bag in accordance with the invention together with a harness therefore;
- Figure 3 is a plan view of the harness for use with the bag of the invention;
- Figure 4 is a plan view of a blank of elastomeric or plastic sheet material for use in the formation of the bag of the invention. Such a blank may consist of one or more panels joined by suitable seams;
- Figure 5 is a schematic illustration of the blank which has been joined together to form a sleeve or tube open at each end which has then had the corner cutouts removed providing tongues to form end panels;
- Figure 6 illustrates the horizontal seam joining the tongues to form the end panel;
- Figure 7 is a schematic illustration of the folded end of the bag with the cutouts arranged to provide the seams which form the end of the

side or vertical panels;

Figure 8 is a schematic illustration of the bag with all panels seamed to constitute the storage bag of the invention;

Figure 9 is a perspective schematic view of a different embodiment of the arrangement shown in figure 8, with the side and end wall sections of the bag converging upwardly;

Figure 10 is a schematic illustration of a blank for forming the bag in Figure 9, which has been joined longitudually to form a sleeve;

Figure 11 is a schematic illustration of the blank in Figure 10 which has had corner cutouts removed therefrom to provide tongues to form the end panels; and

Figure 12 is a schematic illustration of the folded end of the bag in Figure 9 arranged to provide the seams at the junction between the end and side panels.

Referring to Figures 1 to 8 of the drawings, one embodiment of a liquid storage bag in accordance with the invention is characterised in that it is of generally rectangular configuration comprising a base panel 10, a pair of opposed side panels 11 and 12, a pair of opposed end panels 13 and 14 and a roof panel 15.

With reference to Figure 4 the bag will be formed from a blank 16 which is of rectangular shape. By means of a longitudinal joint 29 this blank is formed into a tubular configuration. Square cutouts 31 are made in the tube to form a pair of tongues 17 at each end as illustrated in Figure 5. The tongues 17 are joined by seams 30 to make the end panel 13 as shown in Figure 6.

The ends are folded as shown in Figure 7 in such a manner that the pair of cutouts 31 are transformed into two openings 27 lying one above the other each of which can be joined to form the vertical end seams 18 of the bag.

The seams of the bag will be sealed in a conventual manner with additional reinforcement where necessary. A bag formed as above and depicted in Figure 8 will be of a generally rectangular profile and particularly suitable for housing within a rigid container 19 such as a conventional ISO container. It is envisaged that the bag will be dimensioned to be a snug fit within the container 19.

The bag shown in Figure 8 will preferably be provided with a harness as described in more detail below and housed within the container 19, An alternative arrangement is shown in Figures 9 to 12 which show a version of the bag having side and end walls which slope upwardly in a convergent fashion and which is designed to be free standing within a container 19 without the need for a harness or other supporting devices. It will be noted that the bag is of generally trapezoidal profile. The bag is formed in a similar manner to the bag shown in Figure 8, by utilizing a blank of rectangular shape, not shown, which is formed into a tubular configuration by means of a longitudinal joint 29a, Figure 10. The difference in construction is found in the cutouts 31a which were not square, but of angled shape as shown in Figure 11. As a result of the cutouts 31a, tongues 17a are of unequal size. The tongues 17a are joined by a seam 30a and the ends folded in the manner shown in Figure 12 to provide angled end seams 18a. The seams 18a will be sealed in a conventional manner with additional reinforcement where necessary.

It has been found that the bag of Figure 9 is substantially self supporting and when housed within a container will not impinge on the container wall. Accordingly the bag will usually not require constraining means such as a harness or the like.

As mentioned above the harness Figure 3, may be provided for the embodiment of the bag shown in Figures 1, 2 and 8 to control movement thereof, during filling, discharge and transportation. Loops 24 will secure the harness to the bag, Figure 2. In the preferred arrangement illustrated, the harness comprises a pair of longitudinal strap elements 20 and a plurality of transverse strap elements 21. The longitudinal strap elements extend from the lower corner zones of the container along one end panel 14 of the bag over the upper surface 15 thereof, and along the other end panel 13 of the bag. A suitable hook, clasp of the like formations 22 will be provided for securing the ends of the strap elements to eye formations 26 or the like provided on the floor of the container 19 and adjacent to the walls. The longitudinal strap elements 20 are reinforced at least at the door side of the container by means of a plurality of spaced transverse linking straps 23 provided in the zone of the end panel of the bag. It has been found that the longitudinal straps 20 together with these linking straps 23 will limit excessive surge movement of the end preventing the bag from exerting undue stress on or even bulging out of the door of the container.

It will be appreciated that the linking straps 23 define the contour of the end portions of the strap elements 20. Ring elements serve to link the various strap elements together as shown in Figure 2. The transverse straps 21 of the harness extend transversely across the roof 15 of the bag and down each side panel 11 and 12 thereof as illustrated.

The advantages of the arrangement of the invention will be apparent to persons skilled in the

art. It will be readily apparent that by dispensing with the conventional pallet/bulkhead, both the transportation of full storage bags as well as the return of empty bags will be more economical and less problematic.

Clearly many variations of the invention exist without departing from the principles set out in the consistory clauses. The invention relates to a novel storage bag, a blank for forming such a bag, a harness for use with the bag as well as a transportation system comprising the bag with or without the harness of the invention in combination with a rigid container.

Claims

1. A storage bag of flexible sheet material formed from a single blank (16) having opposed side edges and opposed end edges, folded into a tubular sleeve having, and joined along, a longitudinal seam (29), the tubular sleeve defining a base (10), roof (15), and opposed sidewalls (11,12) for the storage bag, characterised in that the end walls (13,14) of the storage bag are formed by part end wall panel sections (17) projecting from the end edges of the folded blank to fold from the roof and base, or alternatively from the side walls, and being joined along a seam (30) at their end edges, the side edges of the part end wall panel sections being joined to the side walls where the part end wall panel sections fold from the roof and base of the bag, or alternatively joined to the roof and base of the bag where the part end wall panel sections fold from the opposed side walls of the bag.

2. The bag according to claim 1 wherein the bag is of generally rectangular configuration and the part end wall panel sections (17) are substantially rectangular and similar.

3. The bag according to claim 1 wherein the bag is of a generally trapezoidal configuration and the part end wall panel sections (17a) fold towards one another to form a truncated triangular end wall section (13a).

4. The bag according to any one of claims 1 to 3 including a reinforcing harness having free ends (22) adapted to be secured to the interior of a container (19), the harness including two or more longitudinal straps (20) extending over the end sections (13,14) and roof (15) of the bag and one or more transverse straps (21) extending over the side wall sections (11,12), and roof of the bag.

5. The bag according to claim 4 wherein the harness comprises two longitudinal straps (20) which diverge outwardly at the end panels (13,14) of the bag towards to the lower bottom corners of the bag, with a series of cross-brace straps (23) being provided to link the outwardly diverging straps together at intervals at one or both end zones.

6. The bag according to any one of claims 1 to 3 formed from a rectangular panel (16) having opposed side edges and opposed end edges and a pair of spaced part end wall panel sections (17) projecting from each end edge, each part end wall panel section having side edges and an end edge, adjacent part end wall panel sections being arranged so that their end edges can be joined together to constitute an end wall section (13,14) of the bag, with the side edges joined to an adjacent side wall (11,12) roof (15) or base (10) of the bag.

7. The bag according to claim 6 wherein the part end wall panel sections (17) are rectangular.

8. The bag according to claim 6 wherein at each end edge of the rectangular panel (16) the side edges of one part end wall panel section (17a) diverge outwardly towards its end edge while the side edges of the adjacent part end wall panel section (17a) converge inwardly towards its end edge, with the length of both end edges being substantially equal.

9. A method of forming a storage bag comprising the steps of providing a blank of sheet material in the form of a rectangular panel having opposed side edges and opposed end edges, and a pair of spaced part end wall panel sections projecting from each end edge, each part end wall panel section having side edges and an end edge, folding the rectangular panel onto itself and joining the side edges thereof to form a tubular sleeve defining a base, roof, and opposed side walls for the storage bag, joining the end edges of the part end wall panel sections to one another to form an end wall section at each end of the tubular sleeve, and joining the side edges of the end wall sections to the side walls where the part end wall panel sections fold from the roof and base of the bag, or alternatively to the roof and base where the part end wall panel sections fold from the opposed side walls of the bag, to form corner seams.

10. A method as claimed in claim 9 wherein the rectangular panel is folded onto itself and

joined along its side edges to form a tubular sleeve prior to providing the part end wall panel sections.

Patentansprüche

1. Sammelbehälter aus einem flexiblen Flächenmaterial, geformt aus einem einzelnem Rohling (16), der gegenüberliegende Seitenkanten und gegenüberliegende Stirnkanten hat, der in die Form einer schlauchförmigen Manschette gefaltet ist, der eine Längsnaht (29) hat und entlang derer verbunden ist, die schlauchförmige Manschette definiert eine Grundfläche (10), eine Dachfläche (15) und gegenüberliegende Seitenwände (11, 12) für den Sammelbehälter, dadurch gekennzeichnet, daß die Stirnwände (13, 14) des Sammelbehälters aus Teilstirnwandbahnabschnitten (17) geformt sind, die von den Stirnkanten des gefalteten Rohlings hervorstehen, um von der Dachfläche und Grundfläche oder alternativ dazu von den Seitenwänden wegzuklappen und die entlang einer Naht (30) an deren Stirnkanten verbunden sind, die Seitenkanten der Teilstirnwandbahnabschnitte werden dort an die Seitenwände befestigt, wo die Teilstirnwandbahnabschnitte von der Dach- und Grundfläche des Behälters wegklappen oder alternativ dazu dort an die Dach- und Grundfläche des Behälters befestigt werden, wo die Teilstirnwandbahnabschnitte von den gegenüberliegenden Seitenwänden des Behälters wegklappen.

2. Behälter nach Anspruch 1, wobei der Behälter im wesentlichen von rechteckiger Form ist und die Teilstirnwandbahnabschnitte (17) im wesentlichen rechteckig und gleichartig sind.

3. Behälter nach Anspruch 1, wobei der Behälter im wesentlichen von trapezähnlicher Form ist und die Teilstirnwandbahnabschnitte (17a) zueinander gefaltet sind, um einen abgestumpften, dreiecksförmigen Stirnwandabschnitt (13a) zu bilden.

4. Behälter nach jntedem der Ansprüche 1 bis 3, der ein verstärkendes Gurtwerk enthält, das freie Enden (22) hat, die verwendet werden, um an das Innere der Containers (19) befestigt zu werden, das Gurtwerk enthält zwei oder mehr Längsgurte (20), die sich über die Stirnabschnitte (13, 14) und über die Dachfläche (15) des Behälters erstrecken und enthält einen oder mehrere Quergurte (21), die sich über die Seitenwandabschnitte (11, 12) und über die Dachfläche des Behälters erstrecken.

5. Behälter nach Anspruch 4, wobei das Gurtwerk zwei Längsgurte (20) umfaßt, die an den Stirnbahnen (13, 14) des Behälters nach außen in Richtung der unteren Bodenecken des Behälters auseinanderlaufen, mit einer Reihe von Querhaltegurten (23), die zur Verfügung gestellt werden, um die nach außen auseinanderlaufenden Gurte in Abständen an einem oder beiden Endbereichen miteinander zu verbinden.

6. Behälter nach jedem der Ansprüche 1 bis 3, der aus einer rechteckigen Bahn (16) geformt ist, die gegenüberliegende Seitenkanten und gegenüberliegende Stirnkanten und ein Paar von einander entfernt angeordneten Teilstirnwandbahnabschnitten (17) hat, die von jeder Stirnkante hervorstehen, jeder Teilstirnwandbahnabschnitt hat Seitenkanten und eine Stirnkante, aneinander angrenzende Teilstirnwandbahnabschnitte werden so angeordnet, daß deren Stirnkanten miteinander verbindbar sind, um einen Stirnwandabschnitt (13, 14) des Behälters zu errichten, wobei die Seitenkanten mit einer angrenzenden Seitenwand (11, 12), einer Dachfläche (15) oder einer Grundfläche (10) des Behälters verbunden sind.

7. Behälter nach Anspruch 6, wobei die Teilstirnwandbahnabschnitte (17) rechteckig sind.

8. Behälter nach Anspruch 6, wobei bei jeder Stirnkante der rechteckigen Bahn (16) die Seitenkanten des einen Teilstirnwandbahnabschnittes (17a) nach außen hin in Richtung seiner Stirnkanten auseinanderlaufen, während die Seitenkanten des angrenzenden Teilstirnwandbahnabschnittes (17a) nach innen hin in Richtung seiner Stirnkante zusammenlaufen, wobei die Länge beider Stirnkanten im wesentlichen gleich ist.

9. Verfahren zum Formen eines Sammelbehälters, das die Schritte beinhaltet, um einen Rohling aus Flächenmaterial in Form einer rechtekkigen Bahn zur Verfügung zu stellen, die gegenüberliegende Seitenkanten und gegenüberliegende Stirnkanten und ein Paar von einander entfernt angeordneten Teilstirnwandbahnabschnitten hat, die von jeder Stirnkante hervorstehen, jeder Teilstirnwandbahnabschnitt hat Seitenkanten und eine Stirnkante, die rechteckige Bahn wird auf sich selbst gefaltet und deren Seitenkanten werden verbunden, um eine schlauchförmige Manschette zu bilden, die eine Grundfläche, eine Dachfläche und gegenüberliegende Seitenwände für den Sammelbehälter definiert, die Stirnkanten des

Teilstirnwandbahnabschnittes werden miteinander verbunden, um einen Stirnwandabschnitt an jeder Stirnseite der schlauchförmigen Manschette zu bilden, und die Seitenkanten der Stirnwandabschnitte werden dort mit den Seitenwänden verbunden, wo die Teilstirnwandbahnabschnitte von der Dach- und Grundfläche des Behälters weggeklappt sind, oder alternativ dazu mit der Dach- und Grundfläche verbunden sind, wo die Teilstirnwandbahnabschnitte von den gegenüberliegenden Seitenwänden des Behälters weggeklappt sind, um Ecknähte zu bilden.

10. Verfahren nach Anspruch 9, wobei die rechtekkige Bahn auf sich selbst gefaltet ist und entlang seiner Seitenkanten verbunden ist, um eine schlauchförmige Manschette zu bilden, bevor die Teilstirnwandbahnabschnitte zur Verfügung gestellt werden.

Revendications

1. Poche de stockage formée d'un matériau souple en feuille à partir d'une ébauche unique (16), ayant des bords latéraux opposés et des bords d'extrémité opposés, pliée sous forme d'un manchon tubulaire ayant une liaison longitudinale (29) et relié le long de cette dernière, le manchon tubulaire délimitant une base (10), un toit (15) et des parois latérales opposées (11, 12) pour la poche de stockage, caractérisée en ce que les parois d'extrémité (13, 14) de la poche de stockage sont formées par des tronçons (17) de panneau formant parois d'extrémité faisant saillie à partir des bords d'extrémité de l'ébauche pliée, pour être repliés à partir du toit et de la base, ou en variante à partir des parois latérales, et étant reliés le long d'une liaison (30) située au niveau de leurs bords d'extrémité, les bords latéraux des tronçons de panneau formant parois d'extrémité étant reliés aux parois latérales là où les tronçons de panneau formant parois d'extrémité sont repliés à partir du toit et de la base de la poche, ou en variante reliés au toit et à la base de la poche là où les tronçons de panneau formant parois d'extrémité sont repliés à partir des parois latérales opposées de la poche.

2. Poche selon la revendication 1, dans laquelle la poche a une configuration générale rectangulaire et les tronçons (17) de panneau formant parois d'extrémité sont à peu près rectangulaires et similaires.

3. Poche selon la revendication 1, dans laquelle la poche a une configuration générale trapézoîdale et les tronçons (17a) de panneau formant parois d'extrémité sont pliés l'un vers l'autre pour former un tronçon (13a) formant paroi d'extrémité triangulaire tronquée.

4. Poche selon l'une quelconque des revendications 1 à 3, comportant un harnais de renforcement ayant des extrémités libres (22) adaptées pour être fixées à l'intérieur d'un conteneur (19), le harnais comportant deux ou plus de deux bandes longitudinales (20) s'étendant sur les tronçons d'extrémité (13,14) et le toit (15) de la poche et une ou plusieurs bandes transversales (21) s'étendant sur les tronçons (11,12) formant parois latérales et sur le toit de la poche.

5. Poche selon la revendication 4, dans laquelle le harnais comprend deux bandes longitudinales (20) qui divergent vers l'extérieur au niveau des panneaux d'extrémité (13, 14) de la poche vers les coins inférieurs formant fond de la poche , une série de bandes entrelacées (23) étant prévue pour relier les bandes divergeant vers l'extérieur les unes aux autres selon des intervalles au niveau d'une ou des deux zones d'extrémité.

6. Poche selon l'une quelconque des revendications 1 à 3, formée à partir d'un panneau rectangulaire (16) ayant des bords latéraux opposés et des bords d'extrémité opposés et deux tronçons de panneau (17) formant parois d'extrémité écartés faisant saillie à partir de chaque bord d'extrémité, chaque tronçon de panneau formant paroi d'extrémité comportant des bords latéraux et un bord d'extrémité, les tronçons de panneau formant parois d'extrémité adjacents étant agencés de telle sorte que leurs bords d'extrémité peuvent être reliés l'un à l'autre pour constituer un tronçon (13,14) formant paroi d'extrémité de la poche, les bords latéraux étant reliés à une paroi latérale adjacente (11,12), au toit (15) ou à la base (10) de la poche.

7. Poche selon la revendication 6, dans laquelle les tronçons de panneau (17) formant parois d'extrémité sont rectangulaires.

8. Poche selon la revendication 6, dans laquelle au niveau de chaque bord d'extrémité du panneau rectangulaire (16) les bords latéraux d'un tronçon de panneau (17a) formant paroi d'extrémité divergent vers l'extérieur vers son bord d'extrémité alors que les bords latéraux du

tronçon de panneau (17a) formant paroi d'extrémité adjacent convergent vers l'intérieur vers son bord d'extrémité, la longueur des deux bords d'extrémité étant à peu près égale.

9. Procédé de formation d'une poche de stockage comportant les étapes consistant à fournir une ébauche de matériau en feuille sous la forme d'un panneau rectangulaire ayant des bords latéraux opposés et des bords d'extrémité opposés, et deux tronçons de panneau formant parois d'extrémité espacés faisant saillie à partir de chaque bord d'extrémité, chaque tronçon de panneau formant paroi d'extrémité ayant des bords latéraux et un bord d'extrémité , à plier le panneau rectangulaire sur lui-même et relier les bords latéraux de celui-ci pour former un manchon tubulaire délimitant une base, un toit et des parois latérales opposées pour la poche de stockage, à relier les bords d'extrémité des tronçons de panneau formant parois d'extrémité les uns aux autres pour former un tronçon formant paroi d'extrémité au niveau de chaque extrémité du manchon tubulaire, et à relier les bords latéraux des tronçons formant parois d'extrémité aux parois latérales là où les tronçons de panneau formant parois d'extrémité sont repliés à partir du toit et de la base de la poche, ou en variante au toit et à la base là où les tronçons de panneau formant parois d'extrémité sont repliés à partir des parois latérales opposées de la poche pour former des liaisons de coin.

10. Procédé selon la revendication 9, dans lequel le panneau rectangulaire est replié sur lui-même et relié le long de ses bords latéraux pour former un manchon tubulaire avant de réaliser les tronçons de panneau formant parois d'extrémité.

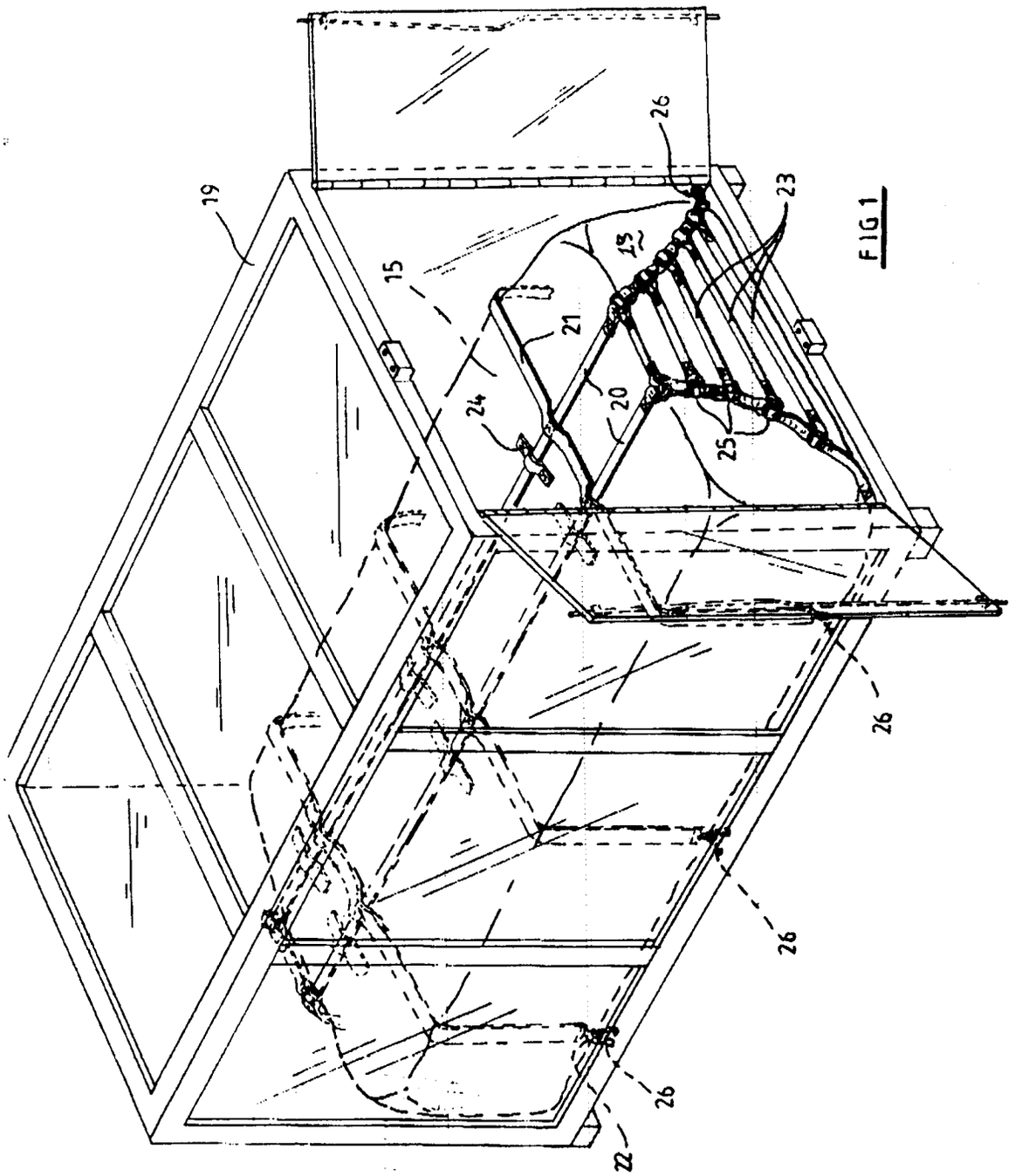

FIG 1

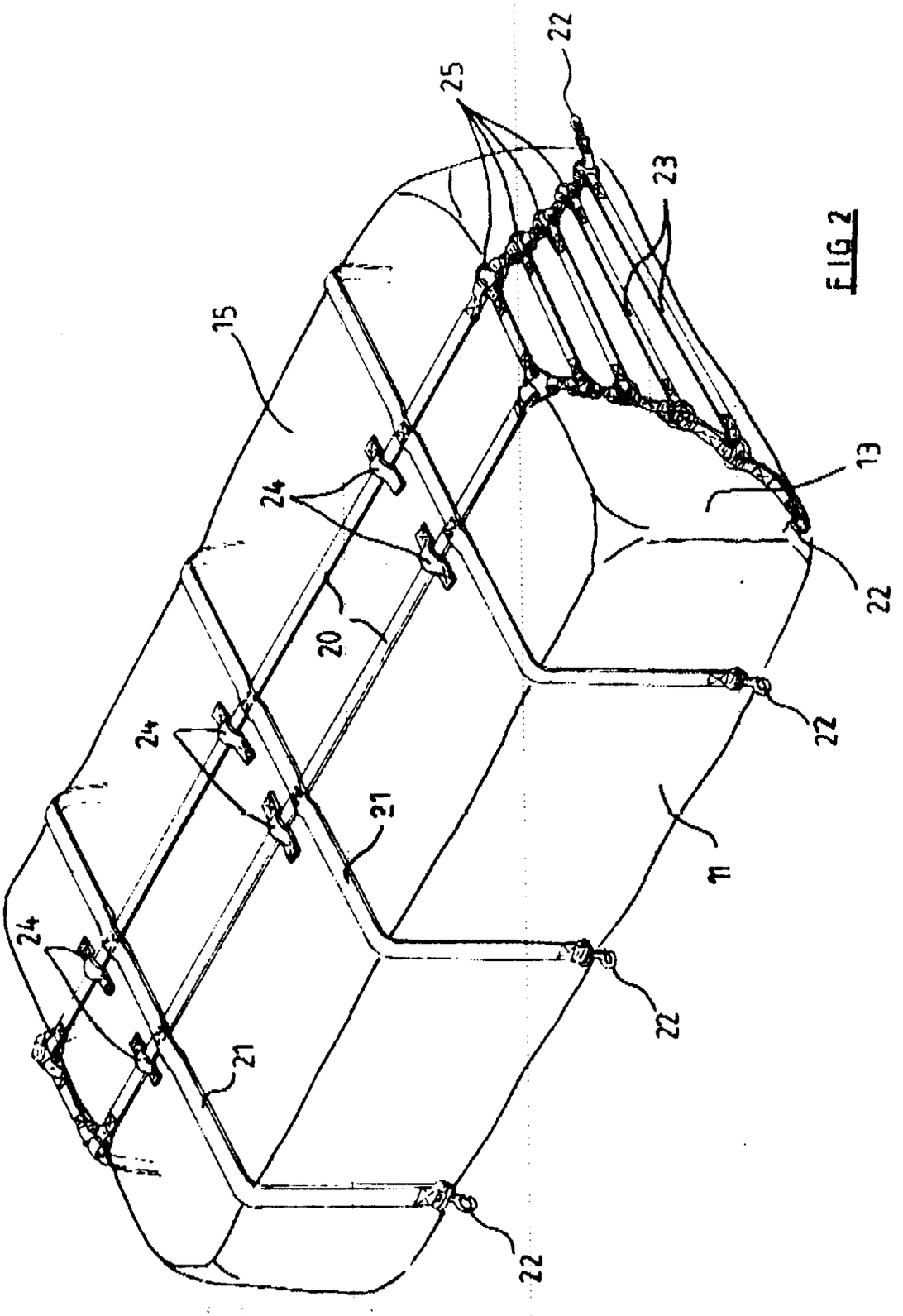

FIG 2

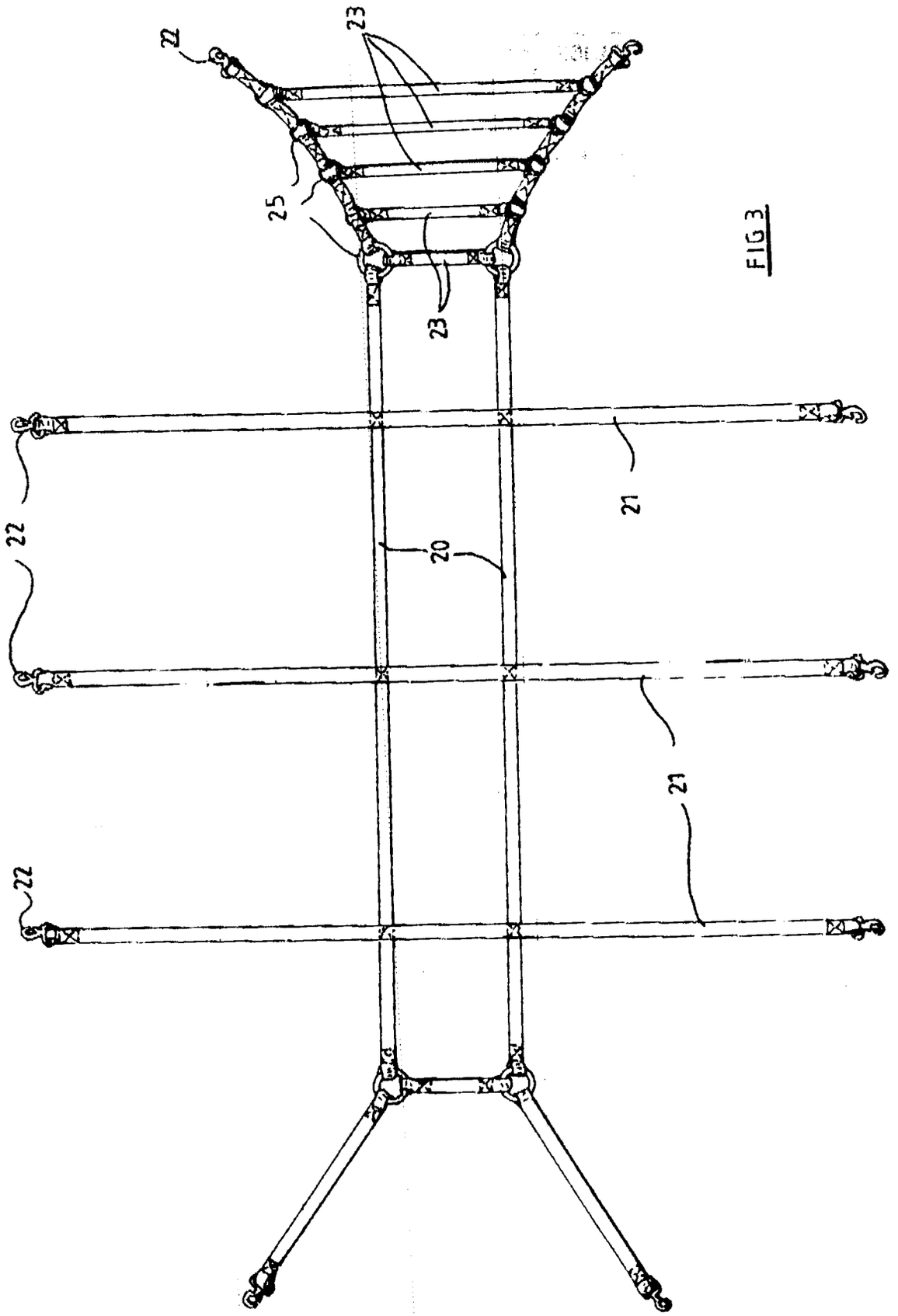

FIG 3

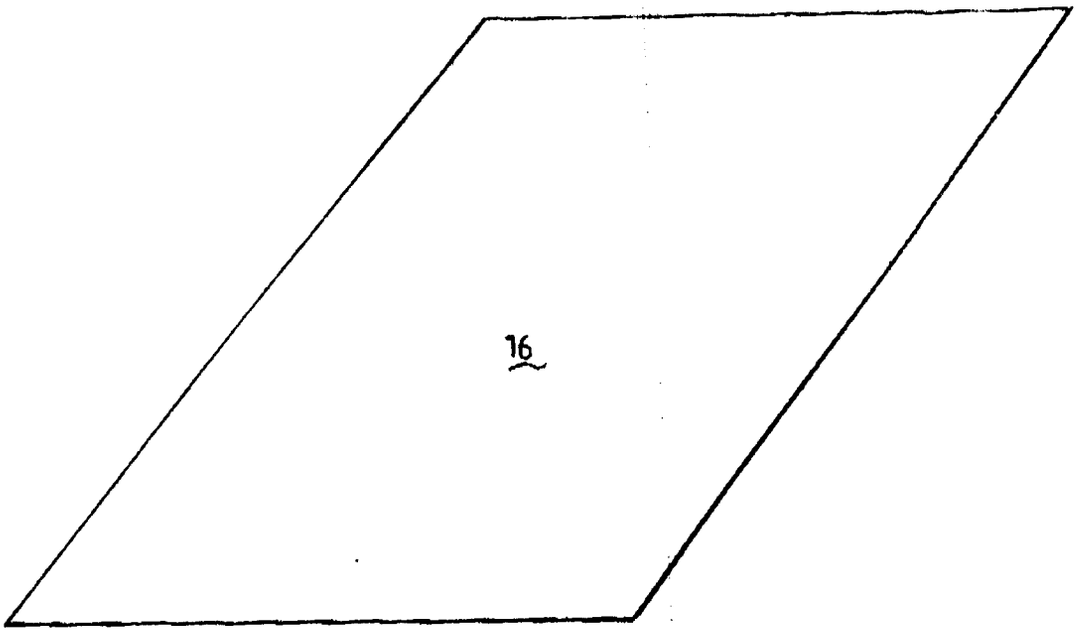

FIGURE 4

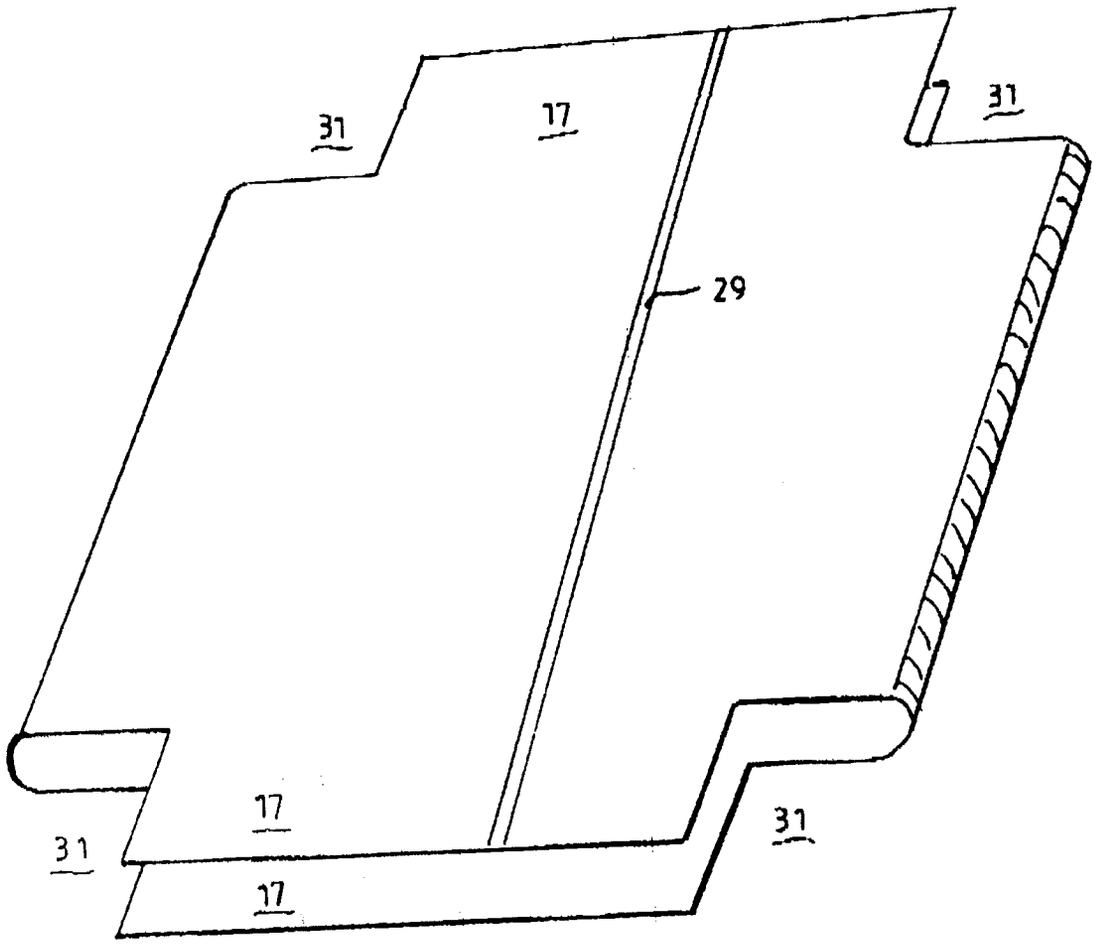

FIGURE 5

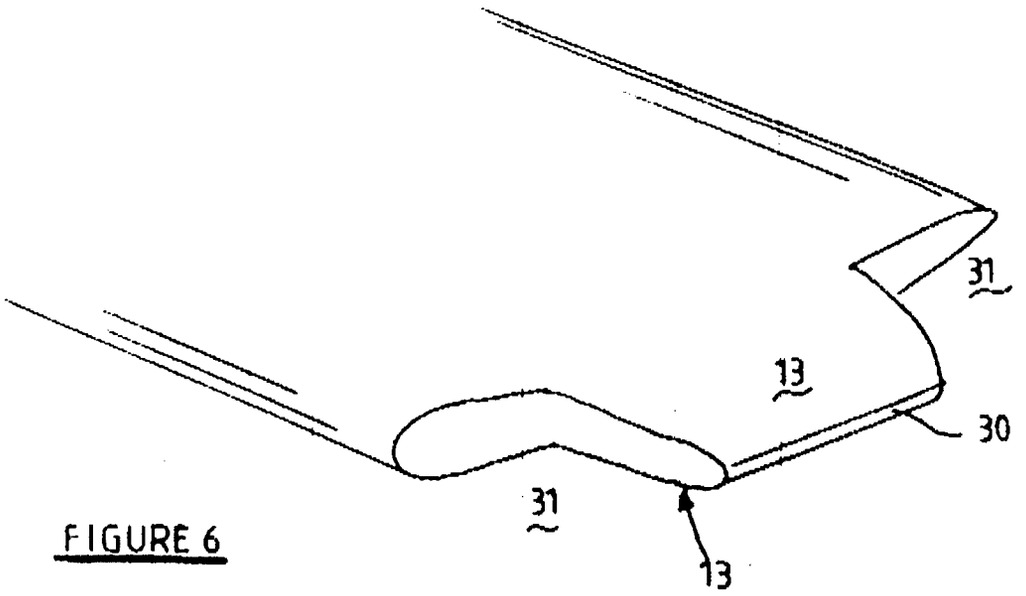

FIGURE 6

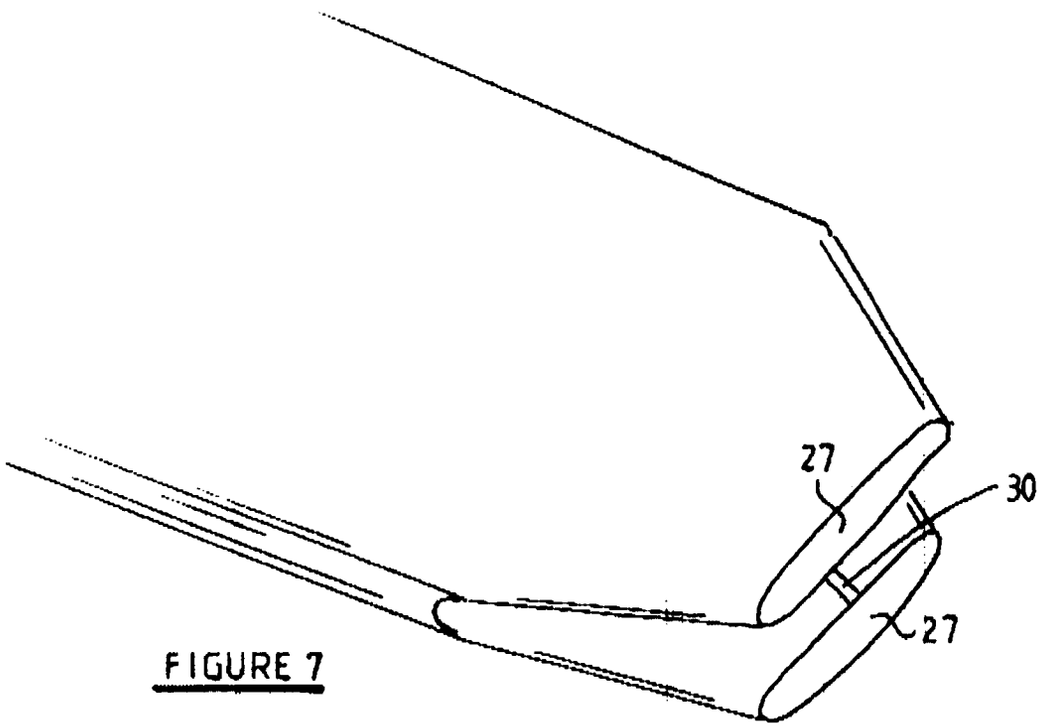

FIGURE 7

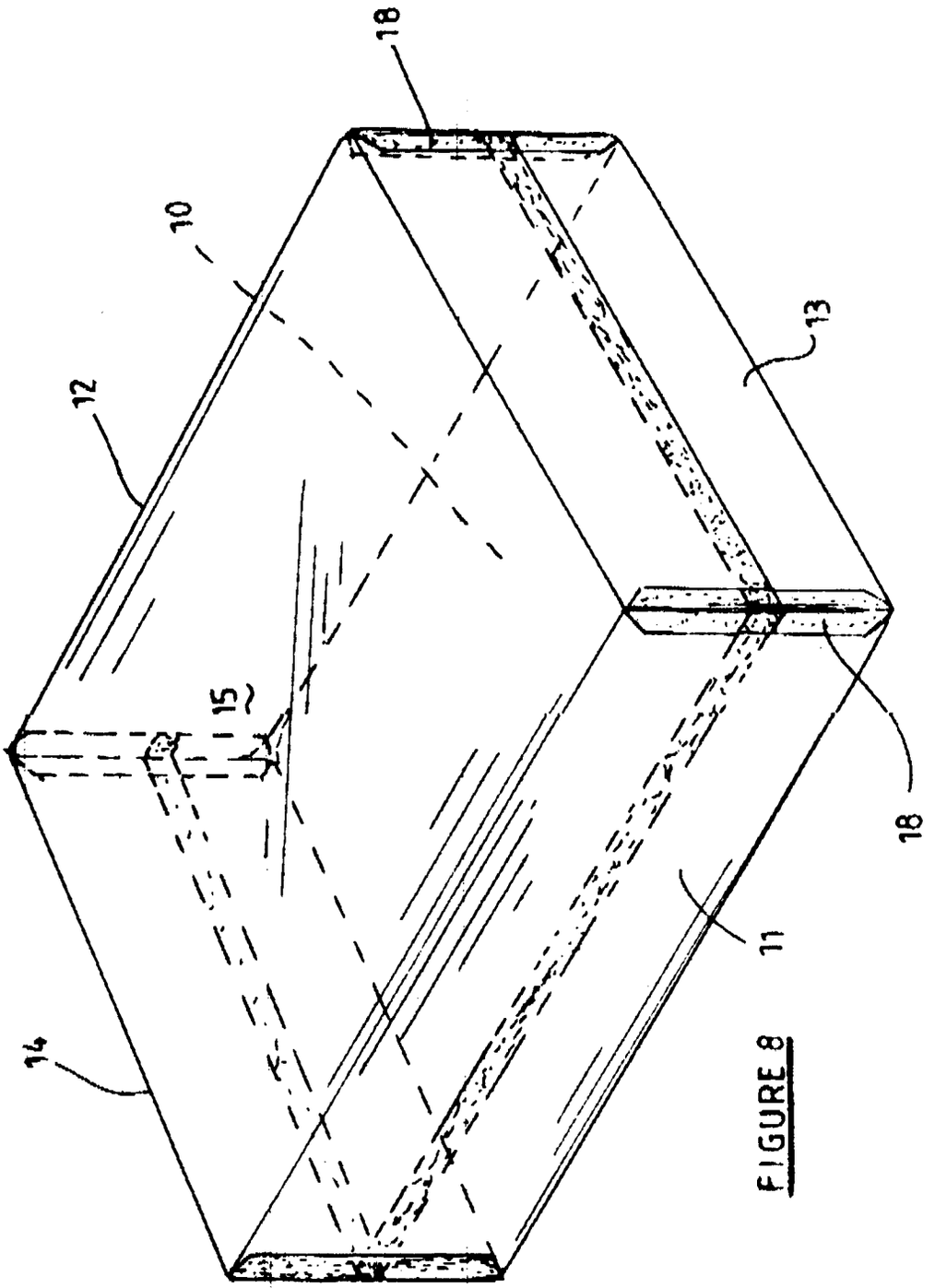

FIGURE 8

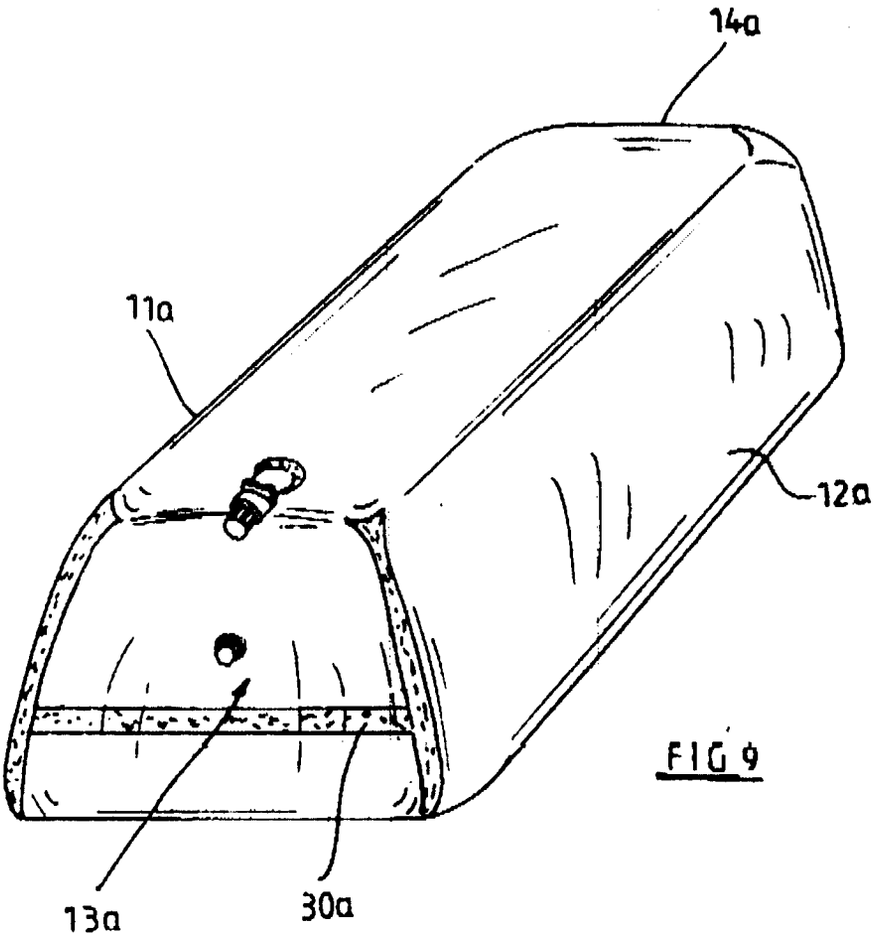

FIG 9

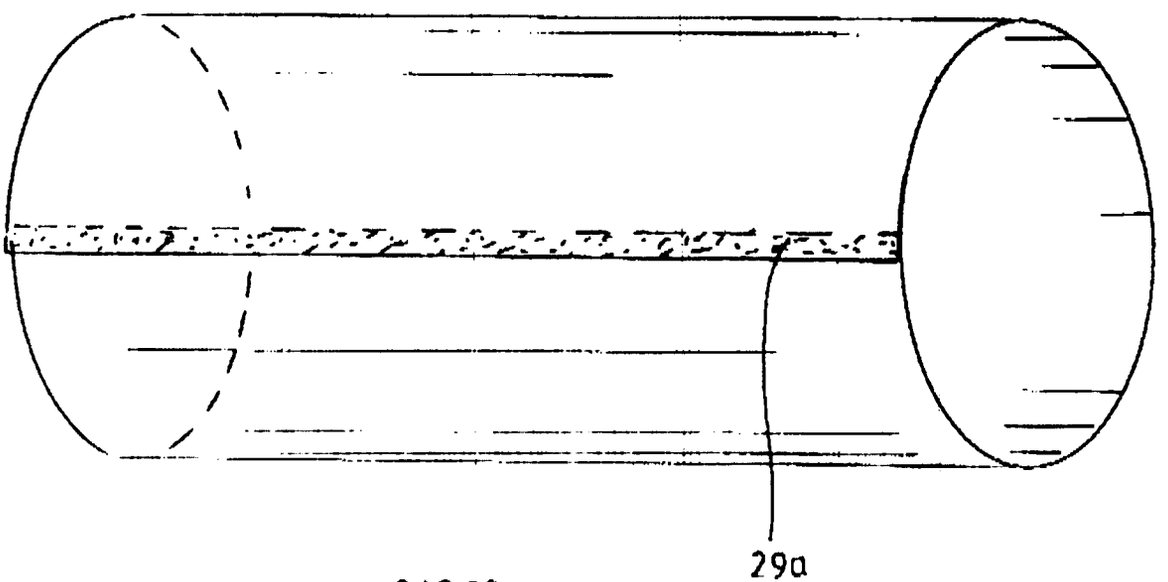

FIG 10

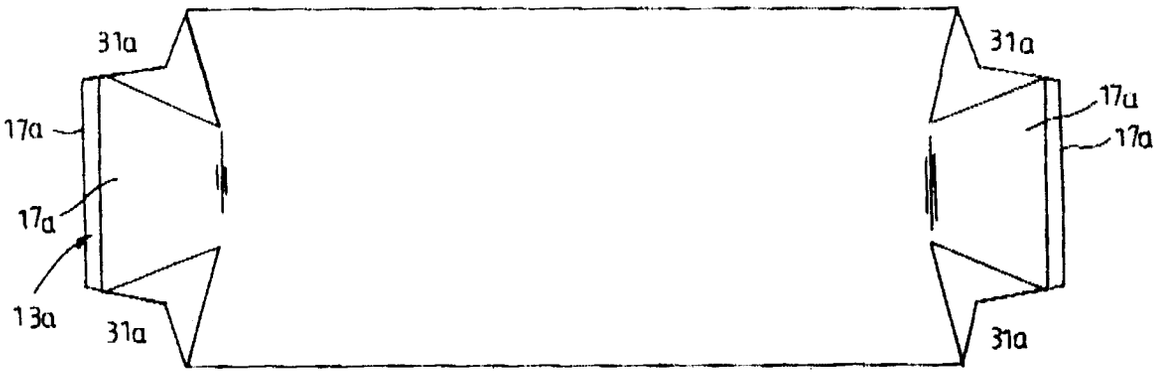

FIG 11

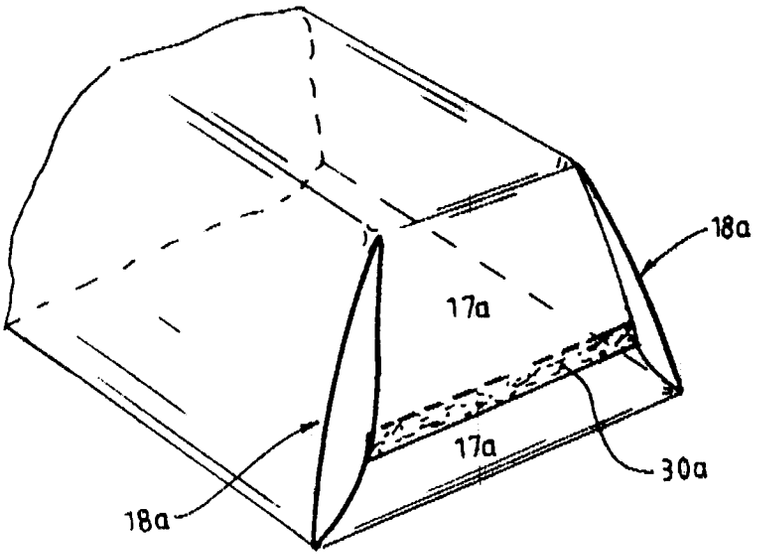

FIG 12