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(54) **A rigid suitcase with a transversely compact hinge**

Hartkoffer mit quer kompaktem Gelenk

Malette rigide avec charnière compacte transverse

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Description

[0001] The present invention relates to a rigid suitcase comprising a transversely compact hinge according to the preamble of claim 1.

[0002] Rigid suitcases of the prior art are formed structurally by two substantially rectangular shells articulated to one another along respective longer sides.

[0003] The hinges of these known suitcases comprise one or more hinge portions generally made of metal and fixed to respective shells; the hinge portions are fitted together to define the cylindrical seat in which the pin is inserted.

[0004] WO99/44460 discloses a soft-sided luggage article having a split-gusset with a security feature in which the hinge elements project from the outer profile of the luggage halves and in which any load perpendicular to the hinge bars is borne by the hinge bars themselves when the luggage is closed.

[0005] US2813295 discloses a bag frame hinge in which the end straps (equivalent to the hinge bars of the previous document) bear the load when the luggage is closed.

[0006] In both these disclosures, the load bearing element is the same one defining the axis of rotation of the hinge and is therefore very important that it does not become deformed due to perpendicular stress.

[0007] On top of this, these hinges have the characteristic that they project transversely from the ideal shape of the suitcase so as to allow the two shells to rotate freely about the pin, enabling the suitcase to be closed tightly.

[0008] In suitcases of less recent design, the hinge remained hidden from view for most of the time so that the problem of the hinge projecting from the "neat" shape of the suitcase did not arise.

[0009] It is only recently with "trolley" suitcases which also have handles and/or wheels on their shorter sides that the hinge has become visible and is disadvantageously perceived by the user as a displeasing appendage which projects from the "neat" shape of the suitcase.

[0010] A need has therefore arisen to conceal or camouflage the hinge so as to reduce this disadvantage as far as possible.

[0011] Up to now, the solutions known in the art have been directed towards camouflaging the projection by manufacturing it of the same material as the shells and integrally therewith.

[0012] However, this measure represents a considerable complication with respect to the stages of the construction of a suitcase with an entirely metal hinge and requires the use of larger hinge portions to achieve a mechanical strength equal to that of metal hinges.

[0013] There is therefore a need to provide a hinge which is transversely compact and at the same time has good mechanical strength and is easy to produce and fit within the finished suitcase.

[0014] The object of the present invention is to provide a suitcase which incorporates such a hinge.

[0015] According to the present invention, this object is achieved by means of a suitcase according to Claim 1. Further preferred embodiments are disclosed in the dependent claims.

[0016] The characteristics and the advantages of the present invention will become clear from the following detailed description of a practical embodiment which is given by way of non-limiting example with reference to the appended drawings, in which:

Figure 1 is a perspective view of a suitcase according to a preferred embodiment of the present invention, conventionally resting on its lower shell,

Figure 2 is a perspective view of a connection element of the suitcase of Figure 1,

Figure 3a is a perspective view of a portion of the upper frame of the suitcase of Figure 1,

Figure 3b is a perspective view of a portion of the lower frame of the suitcase of Figure 1,

Figure 4a shows a section through the upper frame of the suitcase of Figure 1, taken at the level of one of the hinges,

Figure 4b shows a section through the lower frame of the suitcase of Figure 1, taken in the region of one of the hinges,

Figure 5 shows a partial section taken in the region of a hinge through an open suitcase according to an alternative embodiment to that of Figure 1,

Figure 6 shows a schematic partial section taken through a hinge according to the embodiment that is present in the suitcase of Figure 1,

Figure 7 shows a partial schematic section taken through a hinge according to a preferred embodiment of a suitcase having shells integral with the frames.

[0017] With reference to Figure 1, a rigid suitcase, generally indicated 1, is composed of a first outer shell 2, also conventionally referred to as the lower shell, and a second outer shell 3, also conventionally referred to as the upper shell.

[0018] In the preferred embodiment of Figure 1, the two shells 2 and 3 are connected to respective stiffening frames 4 and 5. According to an alternative embodiment shown for example in Figure 7, the shells 2, 3 may also be integral with the stiffening frames 4, 5.

[0019] Shells 2 and 3 are articulated to one another, via frames 4 and 5, by a hinge 6 which is characterized in that it has two parallel pivot axes X1-X1, X2-X2 (visible in Figure 2) defining a longitudinal direction.

[0020] The hinge 6 is composed substantially of a connection element 7 shown in Figure 2 and two hinge portions 8 and 9 which are visible in Figures 3a and 3b, plus the pins which are necessary to achieve rotational restraint but which are not visible in any of the drawings.

[0021] The connection element 7 is connected to the shells 2 and 3 by means of the hinge portions 8 and 9 which are fixed to the shells 2, 3, for example, by riveting, welding, gluing, or plasma welding; the hinge portions 8 and 9 may be produced separately from the frames or, as can be seen in Figures 3 and 4, may be produced integrally with the frames 4, 5.

[0022] The two pivot axes X1-X1, X2-X2 defined by the connection element 7 are parallel to one another and are arranged at a fixed spacing.

[0023] A rotary/translational articulation is thus achieved between the two shells 2 and 3 of the suitcase 1, enabling the two shells 2 and 3 to pivot relative to the connection element 7 about the pivot axes X1-X1 and X2-X2, respectively; the pivot axes X1-X1 and X2-X2 can also rotate relative to one another.

[0024] The connection element 7 comprises a central plate 10 extending in a first plane parallel to the plane extending through the two pivot axes X1-X1, X2-X2 and at least two lateral appendages 11 and 12 fixed firmly to the central plate 10.

[0025] In the embodiment shown in Figure 2, the lateral appendages 11 and 12 are substantially cylindrical with circular cross-sections, are connected internally to the connection element 7, and extend for a defined distance in the longitudinal direction.

[0026] Each appendage 11, 12 comprises at least one seat 11a, 12a for its pin(s) (not shown in the drawings).

[0027] As can be seen from Figures 5, 6 and 7, the surface of the connection element 7 that faces outwardly can merge with the outer profile of the suitcase with continuity, preferably by means of a slightly convex shape.

[0028] Each connection element 7 may have two lateral appendages 11, 12 or, preferably, two pairs of longitudinally separate lateral appendages 11, 12.

[0029] The pin seats 11a, 12a of each lateral appendage are formed by holes which are preferably blind to provide a longitudinal abutment for the pins; however, these seats may also be formed by through-holes in order to use a single pin for each connection element 7 or possibly a single pin for each pivot axis X1-X1, X2-X2.

[0030] Suitable catch means, visible in Figure 6 and in Figure 7 but not in Figure 5, are formed on the outer surfaces of the one or more appendages 11 which define one X1-X1 of the two pivot axes; the catch means can separate the normal suitcase-opening movement as a whole into two successive stages each comprising a pivoting movement through about 90°; in the first stage, the shells pivot through about 90° about one of the two axes X1-X1, X2-X2; in the second stage the pivoting takes place through a further 90° about the other of the two axes X2-X2, X1-X1.

[0031] When a user opens a suitcase 1 according to the present invention which is resting on its lower shell 2, the upper shell 3 thus pivots to a vertical position about one of the two axes X1-X1, X2-X2 and then pivots to the open position about the other axis.

[0032] The catch means thus prevent the upper shell 3 from "dropping"; otherwise, after the shell had opened through a few degrees, its weight would cause it to pivot about both pivot axes X1-X1, X2-X2, following an irregular path.

[0033] Similarly, during the closure of the suitcase, the catch means divide the movement as a whole into a first stage in which the pivoting takes place through about 90° about the second axis X2-X2, that is, as far as the vertical position, and a second stage in which the pivoting takes place through the remaining 90° about the first axis X1-X1, until the suitcase is fully closed.

[0034] The catch means is preferably formed by a projection 13 preferably having a semicircular portion of its outer surface having a radius substantially the same as the radius of the seat 11a which is advantageously approximately one third of the external radius of the appendage 11.

[0035] The projection 13 is disposed along a radius preferably arranged at an angle of about 45° to the plane extending through the two pivot axes X1-X1, X2-X2, and faces towards the interior of the suitcase 1; in Figures 6 and 7, the projection 13 is also shown as being directed downwards.

[0036] With reference now to Figures 3a and 3b, these show the hinge portions 8 and 9, respectively, in a specific embodiment in which they are formed integrally with the lower frame 4 and the upper frame 5.

[0037] Since, except for the presence of a wall 15 in the lower frame 4, the two frames 4 and 5 are approximately symmetrical, solely the lower frame 4 will be referred to in the following description.

[0038] The frame 4 comprises a first seat 16 suitable for receiving and restraining the edge of the lower shell 2 of the suitcase 1. The first seat 16 is defined substantially by a first outer wall 17, a first inner wall 18, and by a base wall 19.

[0039] The first seat 16 has a substantially rectangular cross-section but, naturally, other shapes are possible.

[0040] Opposite the first seat 16 there is a second seat 20 which is delimited by a second outer wall 21, the outer surface of which is connected to that of the first outer wall 17 to define the outer surface of the suitcase 1, by a second inner wall 22, and by a base wall advantageously coinciding with the base wall 19.

[0041] The second outer wall 21 is interrupted to permit the insertion of the connection element 7, defining one or more hollow seats 23 that are open towards the exterior of the suitcase 1.

[0042] Each hollow seat 23 is delimited by two side walls 24, by the second inner wall 22, by the base wall 19, and by an upper wall 25, the functions of which will be explained further below.

[0043] The number of hollow seats 23 corresponds to

the number of pairs of lateral appendages 11, 12 which are to be fitted in the suitcase 1; naturally, an equivalent number of hollow seats 23 will correspondingly be formed in the upper frame 5 to permit the construction of a hinge for each pair of lateral appendages 11, 12.

[0044] The shape of the hollow seats 23 is such as to allow the lateral appendages 11, 12 to rotate inside them.

[0045] A portion of the second outer wall 21 which is interposed between two hollow seats 23 and is slightly shorter to permit the housing of the central plate 10, is visible, indicated 21a, in Figure 3b; the first outer wall 17 may be chamfered in the region of the hollow seats 23 and constitutes an abutment for the central plate 10 so as to limit its rotation to about 90°.

[0046] The number of hollow seats 23 and of walls 21a depends on the number and shape of the hinges 6 included in the suitcase 1. According to a preferred embodiment, there are three hinges 6 each comprising a single connection element 7 such as that shown in Figure 5 but other embodiments provide, for example, for a single connection element 7 which extends substantially along the whole length of the hinged sides and preferably has six pairs of appendages 11, 12; alternatively, it would be possible to consider producing a suitcase having six separate connection elements 7 each having a single pair of appendages 11, 12, or any other combination, by variation both of the total number of pairs of appendages 11, 12 and of the way in which they are grouped in each connection element 7.

[0047] The side walls 24 give the seats 23 the necessary stiffness to withstand the shear forces acting on the hinge 6; a hole 26 is formed in each side wall 24; when the holes 26 are aligned with the holes 11a in the appendages 11, they allow the pins of the hinge 6 to be inserted in the connection element 7 through the second seat 20.

[0048] At least the hollow seats 23 may comprise means that can cooperate with the catch means to bring about the separation of the above-described pivoting movements. In a specific embodiment, these means are constituted by the outer surface of the second inner wall 22.

[0049] In this embodiment, the inner wall 22 of the hollow seat 23 is substantially tangential to the appendage 11 and the projection 13 is arranged in a manner such that, when the two shells 2, 3 have pivoted relative to one another through about 180°, 90° and/or 0°, the projection 13 does not interfere with the second inner wall 22, whereas, outside these angles, the projection 13 is urged against the inner wall 22, deforming it resiliently.

[0050] With reference to Figures 2, 6 and 7, the resilient reaction to the thrust of the projection 13 produces a torque on the connection element 7 which prevents pivoting about the axis X2-X2 until the pivoting movement about the axis X1-X1 is complete. At this point, the force exerted by connection element 7 against the hinge portion 8 suffices to allow the projection 13 to overcome the resistance to resilient deformation of the inner wall 22, permitting the second portion of the pivoting movement.

[0051] The projection 13 and the path of its tip, indicated P, are visible in Figures 6 and 7.

[0052] The projection 13 may advantageously be fitted either on a single pivot axis or on both axes.

[0053] The lower frame 4 also comprises a wall 15 which defines, with the second inner wall 21, a third seat 27 suitable for receiving a gasket 28 for sealing the suitcase 1 when it is closed.

[0054] The frames 4, 5 and the connection element 7 may advantageously be made of a polymer material such as, for example, polypropylene, optionally by injection moulding.

[0055] In order to satisfy contingent and specific requirements, a person skilled in the art will be able to apply to the above-described configurations many modifications and variations all of which, however, are included within the scope of protection of the invention as defined by the appended claims.

Claims

1. A suitcase (1) comprising:

- a first shell (2), a second shell (3), and a hinge (6) for connecting the first shell (2) and the second shell (3), wherein the hinge (6) comprises two distinct, parallel pivot axes (X1-X1, X2-X2);
- two hinge portions (8, 9) suitable for forming the connection with the first and second shells (2, 3), respectively, and a connection element (7), said connection element (7) being articulated to each one of said two hinge portions (8, 9) about each one of said pivot axes (X1-X1, X2-X2), respecively,
- the connection element (7) comprising a central plate (10) which extends in a plane parallel to the plane comprising the pivot axes (X1-X1, X2-X2) and from which at least one appendage (11, 12) projects towards each of the hinge portions (8, 9), the appendages (11, 12) comprising respective seats (11a, 12a) for receiving respective pins **characterized in that**
- said hinge portions (8, 9) comprise a seat (20) delimited by an outer wall (21), said outer wall (21) being interrupted to define one or more hollow seats (23) that are open towards the exterior of the suitcase (1), so as to permit the insertion of the connection element (7),

said hollow seat (23) being shaped so as to allow the lateral appendages (11, 12) to rotate inside them and being delimited by two side walls (24), by an inner wall (22), by a wall (19), and by an upper wall (25).

2. A suitcase (1) according to the preceding claim in

which the connection element (7) comprises two or more pairs of appendages (11, 12) projecting from each side, the seats of all of the appendages (11, 12) that face towards the same side being longitudinally aligned along the same pivot axis (X1-X1, X2-X2).

3. A suitcase (1) according to any one of the preceding claims, comprising means for separating the relative pivoting movements of the two shells (2, 3) into a first pivoting movement about a first one (X1-X1) of the two pivot axes (X1-X1, X2-X2) and a second pivoting movement, subsequent to the first, about a second one (X2-X2) of the two pivot axes (X1-X1, X2-X2).

4. A suitcase (1) according to the preceding claim in which said means comprises a longitudinal projection (13) disposed on the outer surface of at least one of the appendages associated with a first one (X1-X1) of the two pivot axes (X1-X1, X2-X2).

5. A suitcase (1) according to the preceding claim in which the projection (13) is inclined substantially at 45° to the plane extending through the two pivot axes (X1-X1, X2-X2) and projects towards the shells (2, 3) and outwardly.

6. A suitcase (1) according to any one of the preceding claims, comprising two frames (4, 5) interposed between the connection element (7) and each one of said shells (2, 3).

7. A suitcase (1) according to the preceding claim in which the hinge portions (8, 9) are formed integrally within each frame (4, 5) and each frame (4, 5) is connected to the connection element (7) by means of a pin.

Patentansprüche

1. Koffer (1) mit:

- einer ersten Schale (2), einer zweiten Schale (3) und einem Scharnier (6) zum Verbinden der ersten Schale (2) und der zweiten Schale (3), wobei das Scharnier (6) zwei unterschiedliche, parallele Schwenkachsen (X1-X1, X2-X2) aufweist;
- zwei Scharnierteilen (8, 9), die geeignet sind zum Ausbilden der Verbindung mit jeweils der ersten und der zweiten Schale (2, 3) und einem Verbindungselement (7), wobei das Verbindungselement (7) jeweils an einem der zwei Scharnierteile (8, 9) bezüglich einer der Schwenkachsen (X1-X1, X2-X2) gelenkig gelagert ist,
- wobei das Verbindungselement (7) eine Mittelplatte (10) aufweist, die sich in einer zu der Ebene, die die Schwenkachsen (X1-X1, X2-X2) enthält, parallelen Ebene erstreckt und von der mindestens ein Ansatz (11, 12) zu jedem der Scharnierteile (8, 9) hin vorsteht, wobei die Ansätze (11, 12) jeweilige Sitze (11a, 12a) zum Aufnehmen jeweiliger Stifte aufweisen, **dadurch gekennzeichnet, dass**
- die Scharnierteile (8, 9) einen Sitz (20) aufweisen, der von einer Außenwand (21) begrenzt wird, wobei die Außenwand (21) zum Festlegen von einem oder von mehreren Hohlsitzen (23) unterbrochen ist, die zu dem Äußeren des Koffers (1) hin offen sind, so dass sie das Einsetzen des Verbindungselements (7) ermöglichen,

wobei der Hohlsitz (23) so geformt ist, dass sie eine Drehung der lateralen Ansätze (11, 12) in denselben ermöglichen, und von zwei Seitenwänden (24), einer Innenwand (22), einer Wand (19) und einer oberen Wand (25) begrenzt werden.

2. Koffer (1) nach dem vorhergehenden Anspruch, bei dem das Verbindungselement (7) zwei oder mehr Paare von Ansätzen (11, 12) aufweist, die von jeder Seite vorstehen, wobei die Sitze aller Ansätze (11, 12), die zu derselben Seite hin zeigen, entlang derselben Schwenkachse (X1-X1, X2-X2) in Längsrichtung ausgerichtet sind.

3. Koffer (1) nach einem der vorhergehenden Ansprüche, mit einem Mittel zum Trennen der relativen Schwenkbewegungen der zwei Schalen (2, 3) in eine erste Schwenkbewegung um eine erste (X1-X1) der zwei Schwenkachsen (X1-X1, X2-X2) und eine zweite Schwenkbewegung, anschließend an die erste, um eine zweite (X2-X2) der zwei Schwenkachsen (X1-X1, X2-X2).

4. Koffer (1) nach dem vorhergehenden Anspruch, bei dem das Mittel einen Längsvorsprung (13) aufweist, der auf der Außenoberfläche mindestens eines der Ansätze, die einer ersten (X1-X1) der zwei Schwenkachsen (X1-X1, X2-X2) zugeordnet sind, angeordnet ist.

5. Koffer (1) nach dem vorhergehenden Anspruch, bei dem der Vorsprung (13) im Wesentlichen unter 45° bezüglich der Ebene geneigt ist, die sich durch die zwei Schwenkachsen (X1-X1, X2-X2) erstreckt, und zu den Schalen (2, 3) hin und nach außen vorsteht.

6. Koffer (1) nach einem der vorhergehenden Ansprüche, mit zwei Rahmen (4, 5), die zwischen dem Verbindungselement (7) und jeweils einer der Schalen (2, 3) angeordnet sind.

7. Koffer (1) nach dem vorhergehenden Anspruch, bei dem die Scharnierteile (8, 9) einstückig in dem jeweiligen Rahmen (4, 5) ausgebildet sind und der jeweilige Rahmen (4, 5) mittels eines Stiftes mit dem Verbindungselement (7) verbunden ist.

Revendications

1. Valise (1) comprenant :

- une première coque (2), une seconde coque (3), et une charnière (6) qui relie la première coque (2) à la seconde coque (3), dans laquelle la charnière (6) comprend deux axes de pivotement distincts parallèles (X1-X1, X2-X2) ;
- deux parties de charnière (8, 9) qui sont adaptées pour former la connexion avec la première et la seconde coques (2, 3), respectivement, et un élément de connexion (7), ledit élément de connexion (7) étant articulé au niveau de chacune desdites deux parties de charnière (8, 9) autour de chacun desdits axes de pivotement (X1-X1, X2-X2), respectivement ;
- l'élément de connexion (7) comprenant une plaque centrale (10) qui s'étend sur un plan parallèle au plan comprenant les axes de pivotement (X1-X1, X2-X2) et à partir de laquelle au moins un appendice (11, 12) se projette en saillie vers chacune des parties de charnière (8, 9), les appendices (11, 12) comprenant des sièges respectifs (11a, 12a) pour recevoir des broches respectives, **caractérisée en ce** qui :
- lesdites parties de charnière (8, 9) comprennent un siège (20) délimité par une paroi extérieure (21), ladite paroi extérieure (21) étant interrompue pour définir un siège creux (23) ou plus qui débouchent vers l'extérieur de la valise (1) de sorte à permettre l'insertion de l'élément de connexion (7),

lesdits sièges creux (23) étant formés de sorte à permettre aux appendices latéraux (11, 12) de tourner à l'intérieur d'eux et étant délimités par deux parois latérales (24), par une paroi intérieure (22), par une paroi (19), et par une paroi supérieure (25).

2. Valise (1) selon la revendication précédente dans laquelle l'élément de connexion (7) comprend deux paires d'appendices (11, 12) ou plus qui se projettent en saillie à partir de chaque côté, les sièges de tous les appendices (11, 12) qui sont dirigés vers le même côté étant alignés longitudinalement le long du même axe de pivotement (X1-X1, X2-X2).

3. Valise (1) selon l'une quelconque des revendications précédentes, comprenant des moyens pour séparer les mouvements de pivotement relatif des deux coques (2, 3) en un premier mouvement de pivotement autour d'un premier (X1-X1) des deux axes de pivotement (X1-X1, X2-X2) et un second mouvement de pivotement consécutif au premier, autour d'un second (X2-X2) des deux axes de pivotement (X1-X1, X2-X2).

4. Valise (1) selon la revendication précédente dans laquelle lesdits moyens comprennent une protubérance longitudinale (13) disposée sur la surface extérieure d'au moins l'un des appendices associés à un premier (X1-X1) des deux axes de pivotement (X1-X1, X2-X2).

5. Valise (1) selon la revendication précédente dans laquelle la protubérance (13) est inclinée sensiblement à 45° par rapport au plan s'étendant au travers des deux axes de pivotement (X1-X1, X2-X2) et se projette en saillie vers les coques (2, 3) et vers l'extérieur.

6. Valise (1) selon l'une quelconque des revendications précédentes, comprenant deux cadres (4, 5) intercalés entre l'élément de connexion (7) et chacune desdites coques (2, 3).

7. Valise (1) selon la revendication précédente dans laquelle les parties de charnière (8, 9) sont formées intégralement à l'intérieur de chaque cadre (4, 5) et chaque cadre (4, 5) est connecté à l'élément de connexion (7) au moyen d'une broche.

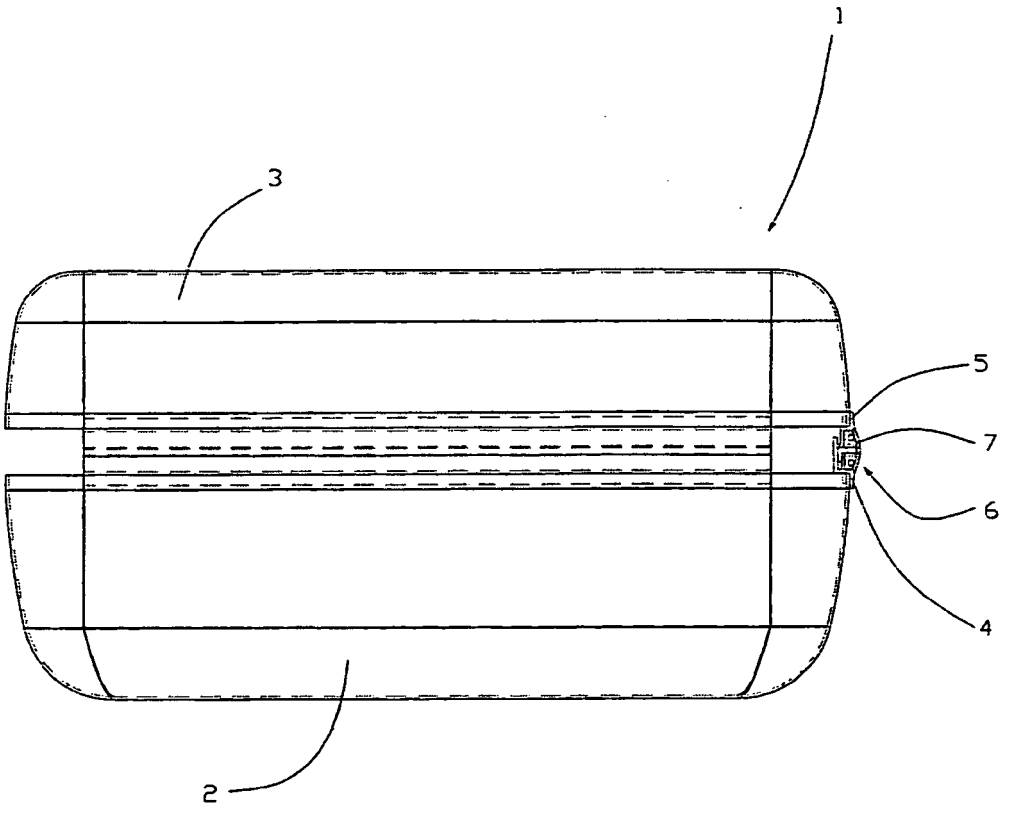


Fig. 1

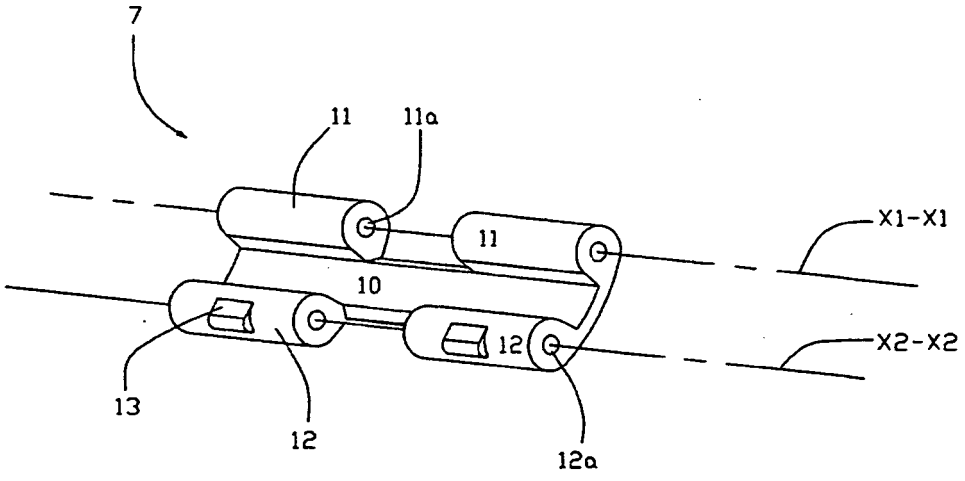


Fig. 2

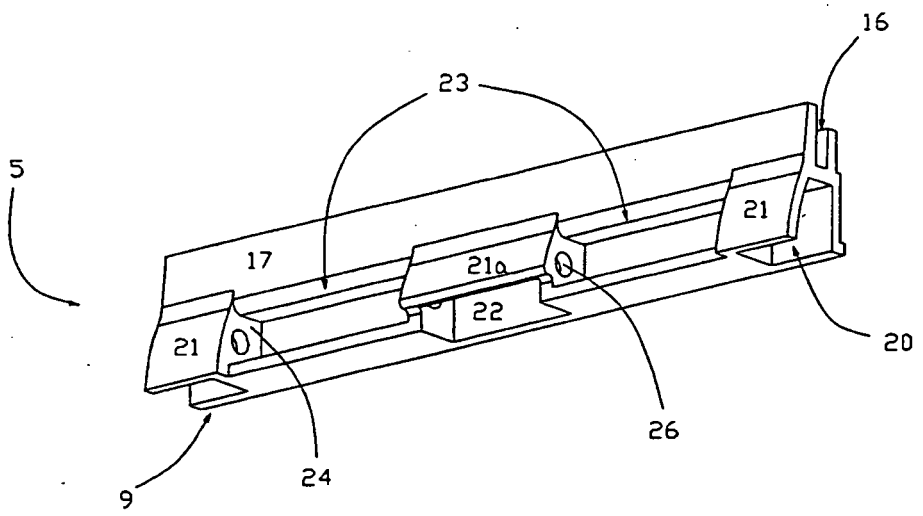

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Fig. 3a

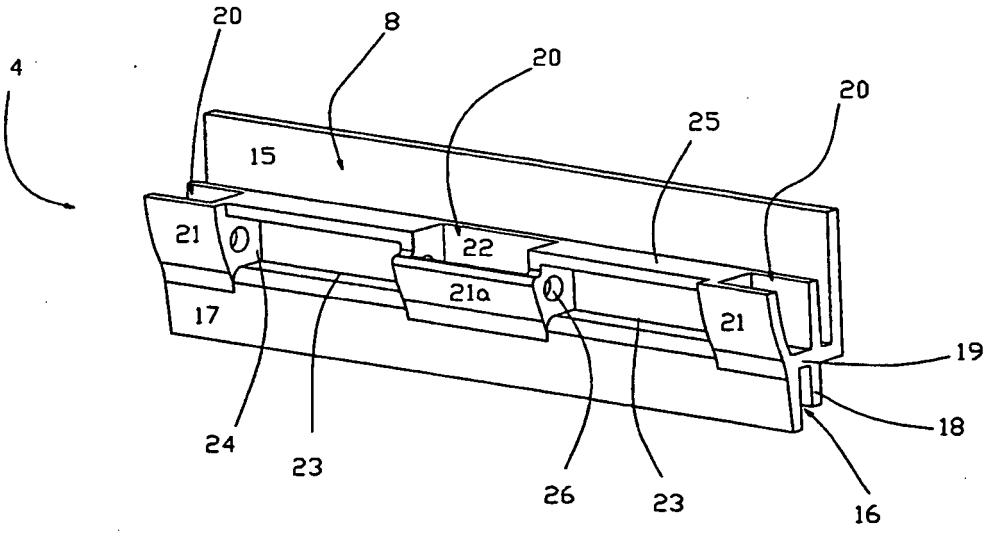

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Fig. 3b

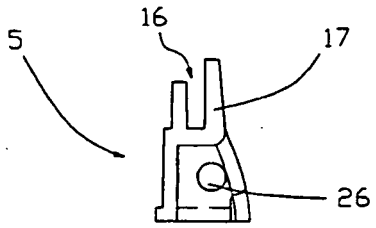


Fig. 4a

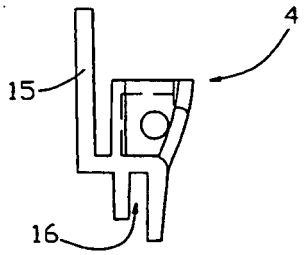


Fig. 4b

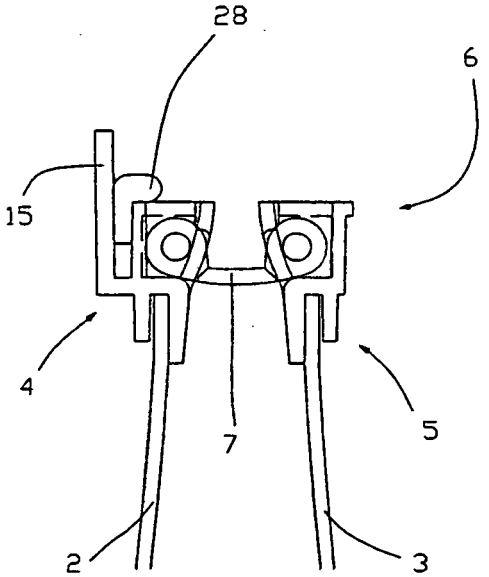


Fig. 5

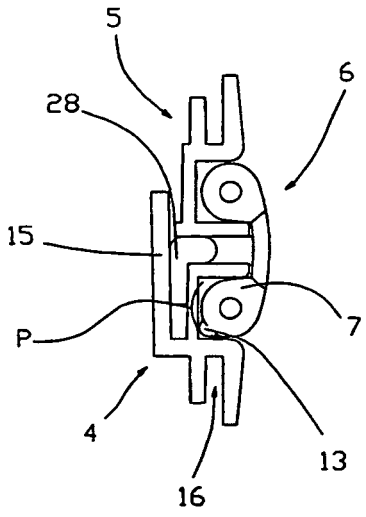


Fig. 6

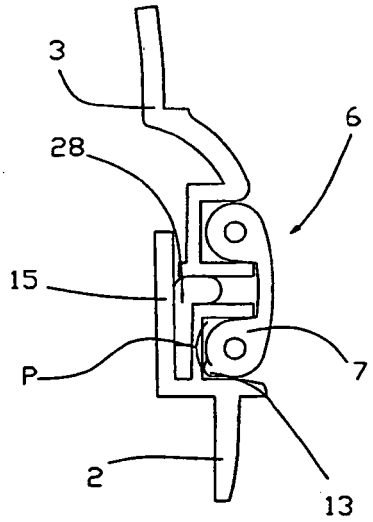


Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 9944460 A **[0004]**
- US 2813295 A **[0005]**