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(54) **Support structure for a swing**

Tragstruktur einer Schaukel

Structure de support pour balançoire

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Description

[0001] The present invention relates to a support structure, joinable in an oscillating manner to a stand, for a swing convertible into a bed and vice versa.

[0002] In the art garden swings are known, E.G. FROM US 634800581 having a support structure joinable in an oscillating manner to a base resting on the ground and comprising a back and a seat suitable for accommodating and supporting a user.

[0003] some known swings allow to convert the support structure from a swing to a bed and vice versa, from a sitting configuration to a lying-down configuration.

[0004] However, the known swings have a plurality of drawbacks.

[0005] In particular, in some devices, when the swing is in the lying-down configuration, the supporting surface is uncomfortable for the user, mainly due to the weight of the back.

[0006] The present invention aims to overcome the drawbacks known in the art and, especially, those mentioned herein before.

[0007] This aim is achieved through a support structure according to claim 1. Further advantages are achieved by the features of the dependent claims.

[0008] The present invention is described below with the help of the attached figures, wherein:

[0009] - figures 1, 2 and 3 show a support structure not part of the present invention, during three separate conversion steps from swing to bed;

[0010] - figures 4a and 4b, 5a and 5b, 6a and 6b show enlarged views of the manoeuvring and safety means of the structure shown in the previous figures, during the steps shown in figures 1, 2 and 3, respectively;

[0011] - figures 7, 8 and 9 show a support structure according to the present invention, according to a further embodiment, during three separate conversion steps from swing to bed;

[0012] figure 10 shows an enlarged detail of the manoeuvring and stop means during the phase shown in figure 8.

[0013] With reference to the mentioned figures, reference numeral 1 globally indicates a support structure, joinable in an oscillating manner to a stand and convertible from a swing into a bed and vice versa, between a sitting configuration and a lying-down configuration.

[0014] The structure 1 comprises seating frame 2, defining a seating surface for a user, and a back frame 3, hinged to the seating frame 2 and rotable around a primary rotation axis X between the sitting configuration and the lying-down configuration.

[0015] According to an embodiment variation, the seating frame 2 and/or the back frame 3 may comprise support means, such as a bedspring or a plurality of substantially parallel staves, in order to make the use of the support structure 1 comfortable for the user.

[0016] Preferably, each stave is positioned transversally to the primary rotation axis x and, for example in the case of the seating frame 2, extends from a first extremity portion 2a to a second extremity portion 2b of the seating frame 2.

[0017] Preferably, the angle α between the seating surface and the back frame 3 is smaller in the sitting configuration than in the lying-down configuration.

[0018] Even more preferably, the angle α between the seating surface and the back frame 3 in the lying-down configuration is substantially 180°.

[0019] The structure 1 further comprises at least a pair of uprights 4', 4", operatively connected to the seating frame 2 and the back frame 3 in order to sustain them in an oscillating manner in relation to the stand, and manoeuvring means, actionable in order to convert the support structure 1 between the sitting configuration and the lying-down configuration.

[0020] In the embodiments shown in figures 1 and 7, the uprights 4', 4" are essentially "L"-shaped, and present a extremity portion 14, having for example a hole or slot 15, joinable in an oscillating manner to the stand.

[0021] Furthermore, the seating frame 2 is sustained in a sliding manner in order to allow its raising or lowering during conversion.

[0022] In other words, switching the support structure 1 from the sitting configuration to the lying-down configuration, the seating frame 2 shifts forwards, orthogonally to the primary rotation axis X. Besides, at the same time, the seating frame 2 raises itself in relation to a vertical axis in order to provide a substantially horizontal supporting surface for a user.

[0023] In still other words, moving the support structure 1 from the sitting configuration to the lying-down configuration, the seating frame 2 shifts forwards and rises vertically while the back frame 3 rotates in relation to the seating frame 2 in order to increase the angle α.

[0024] According to a preferred embodiment, the seating frame 2 is supported by the pair of uprights 4' , 4", as shown in the figures.

[0025] According to a further variation, the support structure 1 further comprises friction reduction means, such as a spacer in plastic material, suitable for preventing the areas of reciprocal contact, between the seating frame 2 and the uprights 4', 4", from suffering damage caused by abrasion during the conversion.

[0026] Preferably, the pair of uprights 4', 4" is mechanically connected by a primary connection section 13, extending along a conjunction line parallel to the primary rotation axis X and distanced from it, in order to create the support for the seating frame 2.

[0027] In other words, in the sitting configuration the extremity portion 2b of the seating frame 2 and the primary connection section 13 are substantially vertically aligned. In the lying-down configuration, the extremity portion 2b advances in relation to the primary connection section 13, in an orthogonal direction to the primary rotation axis X.

[0028] According to a still further variation, the friction reduction means comprise a clip, for example substan-

tially "U"-shaped, which can be snapped onto the primary connection section 13.

[0029] The manoeuvring means comprise at least one lever 5', 5", preferably comprising a first extremity portion 5a, a central portion 5b and a second extremity portion 5c.

[0030] Preferably, the manoeuvring means comprise a first 5' and a second lever 5", each positioned at the sides of the seating frame 2 and mechanically connected by a secondary connection section 11, extending along a conjunction line parallel to the primary rotation axis X.

[0031] In other words, when the first lever 5' is actuated by the user to perform the conversion, the actuation movement is transmitted to the second lever 5" by the secondary connection section 11. This way the user can always use the lever that is more easily accessible to him.

[0032] The lever 5', 5" creates an armrest for the user.

[0033] According to an advantageous embodiment, the first extremity portion 5a extends along a primary axis A, the central portion 5b extends along a secondary axis B, these axis A, B being reciprocally incident.

[0034] In other words, the first extremity portion 5a and the central portion 5b form a broken line, which contributes to bringing and keeping the back frame 3 in the lying-down position without inclining the entire structure 1 in relation to an horizontal plane.

[0035] According to a further embodiment, the second extremity portion 5b extends along a tertiary axis C, the central portion 5b extends along a secondary axis B, these axis C, B being reciprocally incident.

[0036] According to a preferred variation, the first extremity portion 5a is hinged to the back frame 3 and is rotable around a secondary rotation axis Y.

[0037] Preferably, the primary rotation axis X and the secondary rotation axis Y are parallel.

[0038] According to a further preferred variation, the central portion 5b is operatively connected to one of the uprights 4', 4".

[0039] An embodiment variation foresees also that the second extremity portion 5c is suitable for being gripped by the user in order to perform the conversion.

[0040] According to an embodiment not part of the invention, the manoeuvring means comprise a retainer element 6, integral with one of the uprights 4', 4", and a rack element 7, integral with the lever 5', 5", for example along the central portion 5b.

[0041] According to this variation, the rack element 7 comprises a lower engagement portion 7a, comprising at least one tooth or protuberance 8 suitable for abutting against the retainer element 6 in order to block the back frame 3 in the sitting configuration, as illustrated for example, in figures 1, 4a and 4b. The rack element 7 further comprises an upper disengagement portion 7b, wherein the retainer element 6 is free to slide along the rack element 7, in order to enable the conversion of the support structure 1 to the lying-down configuration.

[0042] Preferably, the lower engagement portion 7a comprises a plurality of protuberances 8, reciprocally spaced, in order to enable a plurality of intermediate regulations between the sitting and lying-down configuration.

[0043] In other words, depending on the protuberance 8 against which the retainer element 6 abuts, a different angle α and a different inclination degree of the back frame 3 will be produced.

[0044] Preferably, the support structure 1 further comprises safety means, movable from a safety position, suitable for preventing the accidental translation of the retainer element 6 along the rack element 7, as shown in figures 4b and 6b, to a conversion position, wherein the translation of the retainer element 6 along the upper disengagement portion 7a of the rack element 7 is enabled, as shown in figure 5b.

[0045] For example, the safety means comprise at least one safety lever 9, having an extremity pivotally connected to at least one of the uprights 4', 4" and rotable from the safety position, wherein the tooth 8 is held in abutment against the retainer element 6, and the conversion position.

[0046] For example, the connected extremity of the safety lever 9 is cam-shaped and has an upper rim, orthogonal to its rotation axis, inclined in a manner to render the release operation more complex than the blocking operation.

[0047] Preferably, the support structure 1 comprises a safety lever 9 for each lever 5', 5", that is for each rack element 7.

[0048] This way a child is prevented, while playing on the swing, from accidentally actuating the structure conversion, thus risking for example to crush his extremities between the moving parts.

[0049] The activation of the conversion must, in fact, be concerted, releasing both safety levers 9 positioned on the respective levers 5', 5".

[0050] According an essential feature of the present structure, the manoeuvring means comprises at least one junction lever 10 having a first extremity 10a pivotally joined to one of the uprights 4', 4", and a second extremity 10b pivotally joined to the lever 5' , 5".

[0051] In the embodiment shown in figures 7 to 10, the junction lever 10 is a plate, for example of ellipsoidal shape, sufficiently thin to be able to freely rotate in the free space between the upright 4' , 4" and the lever 5' , 5".

[0052] Preferably, the first extremity 10a of the junction lever 10 is connected, in relation to a vertical axis, at a lower height than that at which the second extremity 10b is attached to the lever 5' , 5", when the support structure 1 is positioned in the sitting configuration, to prevent the accidental conversion of the structure 1.

[0053] According to a preferred embodiment, the support structure 1 further comprises stop means suitable for stopping the rotation of the lever 5', 5" in the sitting configuration and in the lying-down configuration.

[0054] For example, the stop means comprise at least one stop pin 12, integral with one of the uprights 4', 4" and positioned, in relation to a vertical axis, at a lower height than the height at which the first extremity 10a is attached.

[0055] Preferably the stop pin 12 has an external perimeter coated with a material suitable for cushioning impacts of the lever 5', 5", resulting at each conversion.

[0056] According to a preferred embodiment, the structure 1 also comprises a lower support element, for example for the user's legs, operatively connected to the pair of uprights 4', 4" and movable from a use position, wherein the support element is accessible to the user, to a non-use position, wherein the support element is positioned below the seating frame 2.

[0057] Preferably, the lower support element, for example of tubular cross-section and essentially "U"-shaped, is hinged to the uprights 4', 4" and is rotable around an axis parallel to the primary rotation axis X between the use position and the non-use position.

[0058] According to a further embodiment, the support structure 1 also comprises oscillation blocking means of the structure 1, in order to prevent the oscillation of the structure 1, both in the sitting or lying-down configuration, in relation to the stand.

[0059] For example, the oscillation stopping means comprise hooks, tension rods or similar, extending from the structure 1 to the stand and suitable for keeping them integral.

[0060] Innovatively, the support structure according to the present invention makes it possible to convert the swing into a bed having a support surface for a user lying in a horizontal position.

[0061] Advantageously, the support structure according to the present invention makes it possible to have a horizontal bed and swinging in relation to the stand.

[0062] Advantageously, the support structure according to the present invention makes it possible to perform the conversion between at least two configurations by a simple gesture and using only one manoeuvring lever.

[0063] Advantageously, the support structure according to the present invention has a high safety level, preventing accidental conversion of the structure, and thus avoiding extremities crushing, vertebral column knocks and similar.

[0064] Advantageously, the support structure according to the present invention enables the user to actuate the most accessible lever.

[0065] Advantageously, the support structure according to the present invention allows to achieve a plurality of intermediate regulations between the sitting and lying-down configuration.

[0066] Advantageously, the support structure according to the present invention allows to convert the structure in a single movement and with minimum effort, in order to permit its performance by the elderly or people with motor disabilities.

[0067] A person skilled in the art may make modifications to the embodiments of the structure described above in order to satisfy contingent requirements, while remaining within the scope of protection as defined by the following claims.

Claims

1. Support structure (1), joinable in an oscillating manner to a stand, for a swing convertible into a bed and vice versa, between a sitting configuration and a lying-down configuration, comprising:

   - a seating frame (2) defining a seating surface for a user;
   - a back frame (3), hinged to the seating frame (2) and rotable around a primary rotation axis (X) between the sitting configuration and the lying-down configuration;
   - at least a pair of uprights (4', 4"), operatively connected to said frames (2, 3) so as to sustain them in an oscillating manner in relation to the stand; and
   - manoeuvring means, actionable in order to convert the support structure (1) between the sitting configuration and the lying-down configuration;

   wherein the seating frame (2) is supported in a sliding manner in order to allow its raising or lowering during conversion,
   said support structure (1) being **characterised in that** the manoeuvring means comprise at least one lever (5', 5") creating an armrest for the user and at least one junction lever (10) having a first extremity (10a) pivotally joined to one of the uprights (4', 4"), and a second extremity (10b) pivotally joined to the lever (5', 5") .

2. Structure (1) according to claim 1, wherein the seating frame (2) is supported by the pair of uprights (4' 4").

3. Structure (1) according to claims 1 or 2, wherein the pair of uprights (4', 4") are mechanically connected by a primary connection section (13), extending along a conjunction line parallel to the primary rotation axis (X) and separated from it, in such a way to create the support for the seating frame (2).

4. Structure (1) according to any of the previous claims, wherein the angle α between the seating surface and the back frame (3) is smaller in the sitting configuration than in the lying-down configuration.

5. Structure (1) according to any of the previous claims, wherein the angle (α) between the seating surface and the back frame (3) in the lying-down configuration is substantially 180°.

6. Structure (1) according to any of the previous claims, wherein the lever (5', 5") comprises a first extremity portion (5a), a central portion (5b) and a second extremity portion (5c).

7. Structure (1) according to claim 6, comprising a first (5') and a second lever (5"), each positioned at the sides of the seating frame (2) and mechanically connected by a secondary connection section (11), extending along a conjunction line parallel to the primary rotation axis (X) .

8. Structure (1) according to claims 6 or 7, wherein the first extremity portion (5a) extends along a primary axis (A), the central portion (5b) extends along a secondary axis (B), these axis (A, B) being incident.

9. Structure (1) according to any of the claims from 6 to 8, wherein the first extremity portion (5a) is hinged to the back frame (3) and is rotable around a secondary rotation axis (Y).

10. Structure (1) according to any of the claims from 6 to 9, wherein the central portion (5b) is operatively connected to one of said uprights (4', 4").

11. Structure (1) according to any of the previous claims, wherein the first extremity (10a) of the junction lever (10) is connected, in relation to a vertical axis, at a lower height than that at which the second extremity (10b) is connected to the lever (5', 5"), when the support structure (1) is positioned in the sitting configuration, in order to prevent accidental conversion.

12. Structure (1) according to any of the previous claims, further comprising stop means suitable for stopping the rotation of the lever (5', 5") in the sitting configuration and in the lying-down configuration.

13. Structure (1) according to claim 12, wherein the stop means comprise at least one stop pin (12), joined to one of the uprights (4', 4") and situated, in relation to a vertical axis, at a lower height than the height at which the first extremity (10a) is attached.

Patentansprüche

1. Tragstruktur (1), schwingend mit einem Gestell verbindbar, für eine Schaukel, die in ein Bett und umgekehrt konvertierbar ist, zwischen einer Sitzkonfiguration und einer Liegekonfiguration, aufweisend:

- einen Sitzrahmen (2) der eine Sitzoberfläche für einen Benutzer definiert;
- einen Rückenrahmen (3) der gelenkig mit dem Sitzrahmen (2) verbunden ist, und der um eine primäre Rotationsachse (X) drehbar ist, zwischen der Sitzkonfiguration und der Liegekonfiguration;
- zumindest ein Paar von Pfosten (4', 4"), das betrieblich mit den Rahmen (2, 3) verbunden ist, um diese schwingend bezüglich des Gestells zu stützen; und
- Wendemittel, die betätigbar sind um die Tragstruktur (1) zwischen der Sitzkonfiguration und der Liegekonfiguration zu konvertieren;

wobei der Sitzrahmen (2) gleitend gelagert ist, so dass sein Erhöhen und Erniedrigen während des Konvertierens möglich ist,
wobei die Tragstruktur (1) **dadurch gekennzeichnet ist, dass** die Wendemittel zumindest einen Hebel (5', 5") aufweisen, der eine Armstütze für den Benutzer erzeugt, und zumindest einen Verbindungshebel (10) der ein erstes Ende (10a) hat, das schwenkbar mit einem der Pfosten (4', 4") verbunden ist, und ein zweites Ende (10b) das schwenkbar mit dem Hebel (5', 5") verbunden ist.

2. Struktur (1) gemäß Anspruch 1, wobei der Sitzrahmen (2) durch ein Paar von Pfosten (4', 4") getragen ist.

3. Struktur (1) gemäß einem der Ansprüche 1 oder 2, wobei das Paar von Pfosten (4', 4") mechanisch durch einen primären Verbindungsabschnitt (13) verbunden ist, der sich entlang einer Verbindungslinie parallel zu der primären Rotationsachse (X) und davon beabstandet erstreckt, um das Lager für den Sitzrahmen (2) zu bilden.

4. Struktur (1) gemäß einem der vorhergehenden Ansprüche, wobei der Winkel (α) zwischen der Sitzoberfläche und dem Rückenrahmen (3) in der Sitzkonfiguration kleiner ist als i n der Liegekonfiguration.

5. Struktur (1) gemäß einem der vorhergehenden Ansprüche, wobei der Winkel (α) zwischen der Sitzoberfläche und dem Rückenrahmen (3) in der Liegekonfiguration im Wesentlichen 180° ist.

6. Struktur (1) gemäß einem der vorhergehenden Ansprüche, wobei der Hebel (5', 5") einen ersten Endabschnitt (5a), einen Zentralabschnitt (5b) und einen zweiten Endabschnitt (5c) aufweist.

7. Struktur (1) gemäß Anspruch 6, aufweisend einen ersten (5') und einen zweiten (5") Hebel, wobei jeder an den Seiten des Sitzrahmens (2) positioniert ist und mechanisch verbunden durch einen sekundären Verbindungsabschnitt (11), der sich entlang einer Verbindungslinie parallel zu der primären Rotationsachse (X) erstreckt.

8. Struktur (1) gemäß einem der Ansprüche 6 oder 7, wobei der erste Endabschnitt (5a) sich entlang einer primären Achse (A) erstreckt, wobei der Zentralabschnitt (5b) sich entlang einer sekundären Achse (B) erstreckt, und wobei diese Achsen (A, B) einfallend

sind.

9. Struktur (1) gemäß einem der Ansprüche 6 bis 8, wobei der erste Endabschnitt (5a) gelenkig an den Rückenrahmen (3) angebunden ist, und drehbar um eine sekundäre Rotationsachse (Y) ist.

10. Struktur (1) gemäß einem der Ansprüche 6 bis 9, wobei der Zentralabschnitt (5b) betrieblich mit einem der Pfosten (4', 4") verbunden ist.

11. Struktur (1) gemäß irgendeinem der vorhergehenden Ansprüche, wobei das erste Ende (10a) des Verbindungshebels (10) im Verhältnis zu einer vertikalen Achse bei einer kleineren Höhe verbunden ist, als der bei welcher das zweite Ende (10b) mit dem Hebel (5', 5") verbunden ist, wenn die Tragstruktur (1) in der Sitzkonfiguration positioniert ist, um eine ungewollte Konversion zu verhindern.

12. Struktur (1) gemäß einem der vorhergehenden Ansprüche, weiter aufweisend Unterbrechungsmittel die geeignet sind, die Rotation der Hebel (5', 5") in der Sitzkonfiguration und in der Liegekonfiguration zu unterbrechen.

13. Struktur (1) gemäß Anspruch 12, wobei die Unterbrechungsmittel zumindest einen Unterbrechungsstift (12) aufweisen, der mit einem der Pfosten (4', 4") verbunden ist, und positioniert bei einer kleineren Höhe in Relation zu einer vertikalen Achse als die Höhe bei welcher das erste Ende (10a) angebracht ist.

Revendications

1. Structure de support (1), pouvant être assemblée de manière oscillante à une armature, pour une balançoire convertible en lit et vice versa, entre une configuration assise et une configuration allongée, comprenant:

- un châssis d'assise (2) définissant une surface d'assise pour un utilisateur;
- un châssis de dossier (3), articulé sur le châssis d'assise (2) et rotatif autour d'un axe de rotation principal (X) entre la configuration assise et la configuration allongée;
- au moins une paire de montants (4', 4 ") connectés fonctionnellement auxdits châssis (2, 3) de manière à les soutenir d'une manière oscillante relativement à l'armature; et
- un moyen de manoeuvre, pouvant être actionné pour convertir la structure de support (1) entre la configuration assise et la configuration allongée;

dans laquelle le châssis d'assise (2) est supporté de manière glissante afin de permettre sa montée ou sa descente pendant la conversion,
ladite structure de support (1) étant **caractérisée en ce que** le moyen de manoeuvre comprend au moins un levier (5', 5") créant un accoudoir pour l'utilisateur et au moins un levier de jonction (10) ayant une première extrémité (10a) liée de façon pivotante à l'un des montants (4', 4"), et une deuxième extrémité (10b) liée de façon pivotante au levier (5', 5").

2. Structure (1) selon la revendication 1, dans laquelle le châssis d'assise (2) est supporté par la paire de montants (4', 4").

3. Structure (1) selon la revendication 1 ou 2, dans laquelle les montants (4', 4") sont reliés mécaniquement par une portion de connexion principale (13), s'étendant le long d'une ligne de conjonction parallèle à l'axe de rotation principal (X) et séparée de celui-ci, de manière à créer le support pour le châssis d'assise (2).

4. Structure (1) selon l'une quelconque des revendications précédentes, dans laquelle l'angle (α) entre la surface d'assise et le châssis de dossier (3) est plus petit dans la configuration assise que dans la configuration allongée.

5. Structure (1) selon l'une quelconque des revendications précédentes, dans laquelle l'angle (α) entre la surface d'assise et le châssis de dossier (3) dans la configuration allongée vaut sensiblement 180°.

6. Structure (1) selon l'une quelconque des revendications précédentes, dans laquelle le levier (5', 5") comprend une première partie d'extrémité (5a), une partie centrale (5b) et une deuxième partie d'extrémité (5c) .

7. Structure (1) selon la revendication 6, comprenant un premier (5') et un deuxième levier (5"), chacun étant positionné sur les côtés du châssis d'assise (2), et reliés mécaniquement par une portion de connexion secondaire (11) s'étendant le long d'une ligne de conjonction parallèle à l'axe de rotation principal (X).

8. Structure (1) selon la revendication 6 ou 7, dans laquelle la première partie d'extrémité (5a) s'étend le long d'un axe principal (A), la partie centrale (5b) s'étend le long d'un axe secondaire (B), ces axes (A, B) étant incidents.

9. Structure (1) selon l'une quelconque des revendications 6 à 8, dans laquelle la première partie d'extrémité (5a) est articulée sur le châssis de dossier (3) et est rotative autour d'un axe de rotation secondaire

(Y).

10. Structure (1) selon l'une quelconque des revendications 6 à 9, dans laquelle la partie centrale (5b) est connectée fonctionnellement à l'un desdits montants (4', 4").

11. Structure (1) selon l'une quelconque des revendications précédentes, dans laquelle la première extrémité (10a) du levier de jonction (10) est connectée, relativement à un axe vertical, à une hauteur inférieure à celle à laquelle la deuxième extrémité (10b) est connectée au levier (5', 5") quand la structure de support (1) est positionnée dans la configuration assise, afin de prévenir une conversion accidentelle.

12. Structure (1) selon l'une quelconque des revendications précédentes, comprenant en outre un moyen d'arrêt adapté pour arrêter la rotation du levier (5', 5") dans la configuration assise et dans la configuration allongée.

13. Structure (1) selon la revendication 12, dans laquelle le moyen d'arrêt comprend au moins une butée d'arrêt (12), liée à l'un des montants (4', 4") et située, relativement à un axe vertical, à une hauteur inférieure à la hauteur à laquelle la première extrémité (10a) est attachée.

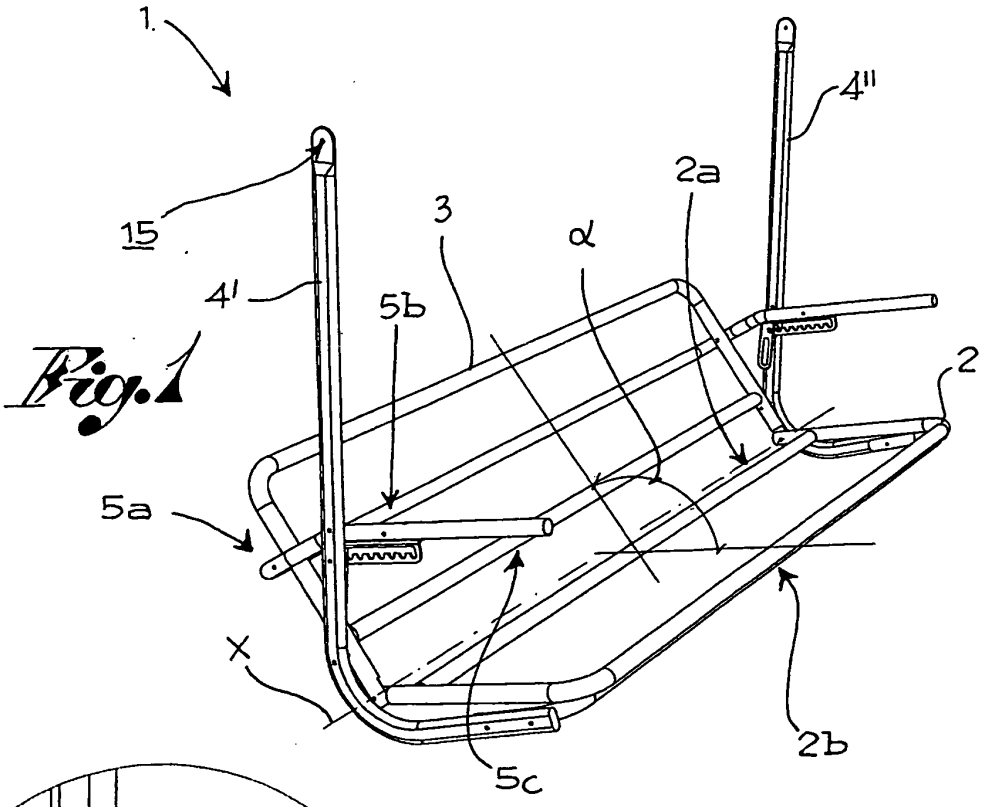


Fig. 1

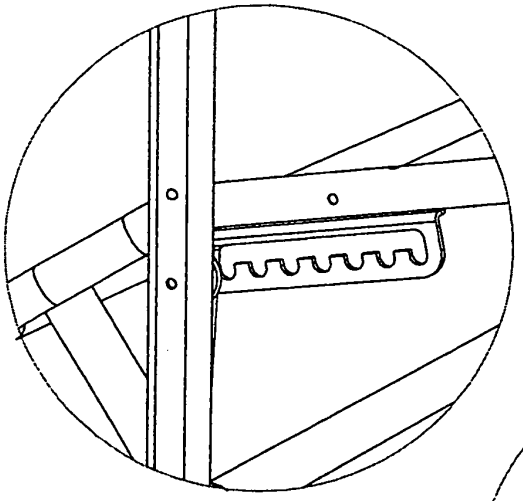


Fig. 4a

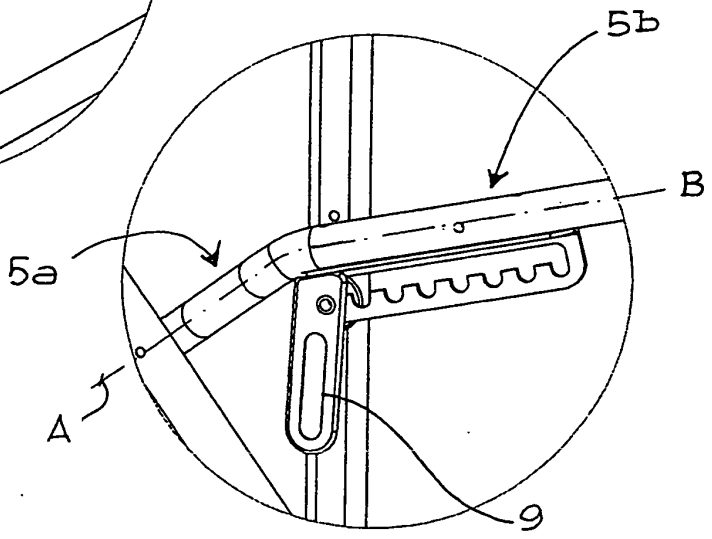


Fig. 4b

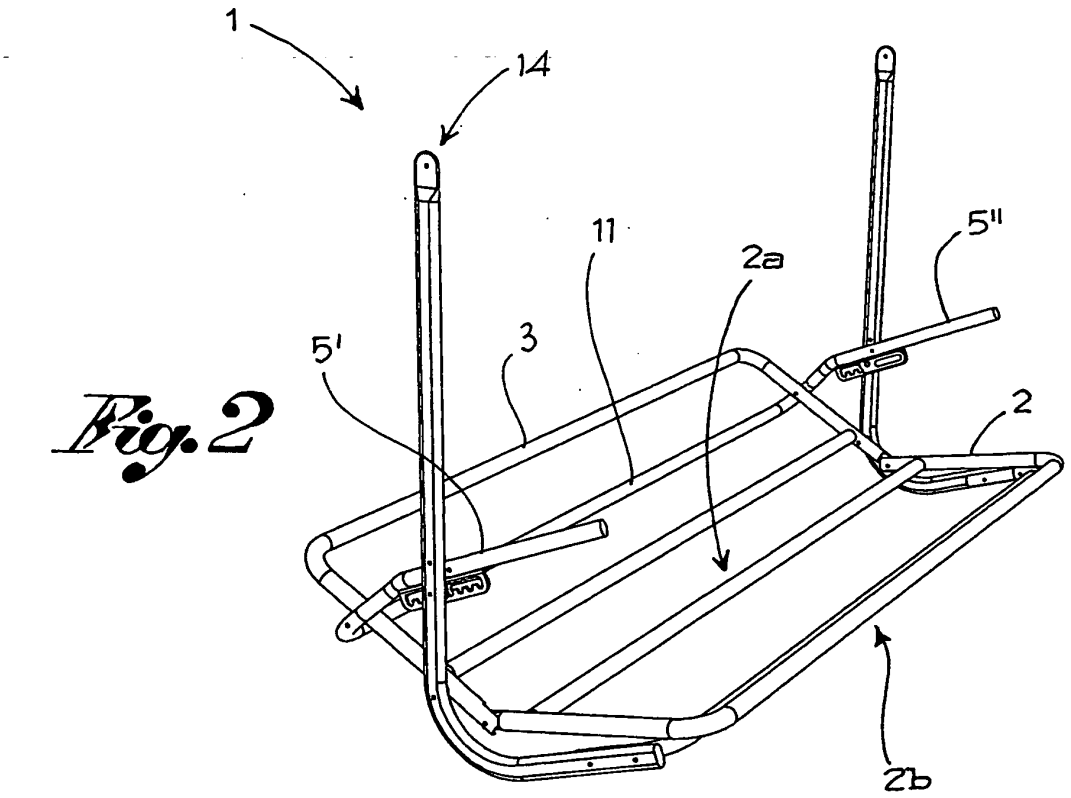


Fig. 2

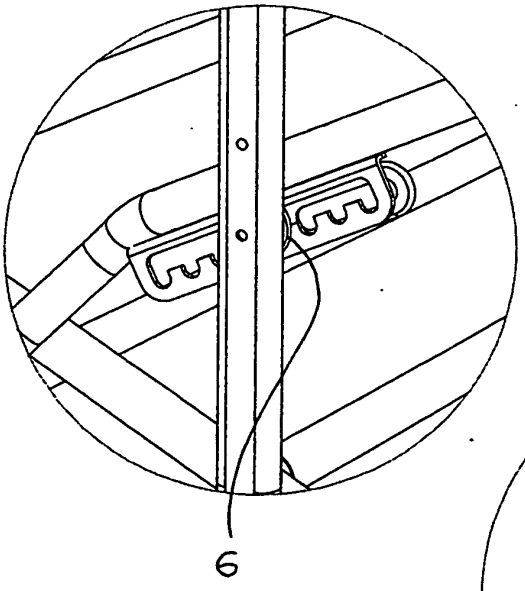
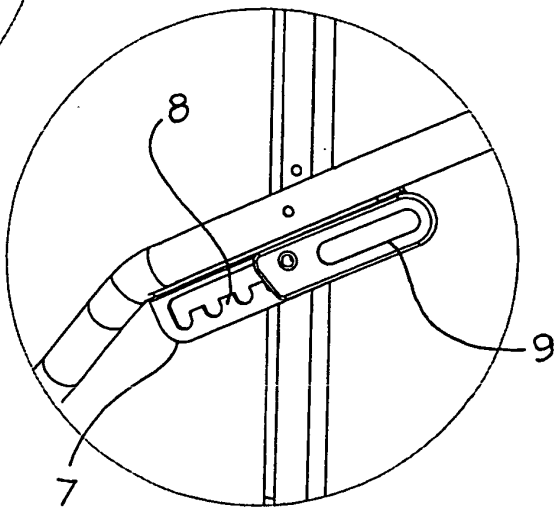


Fig. 5a

Fig. 5b



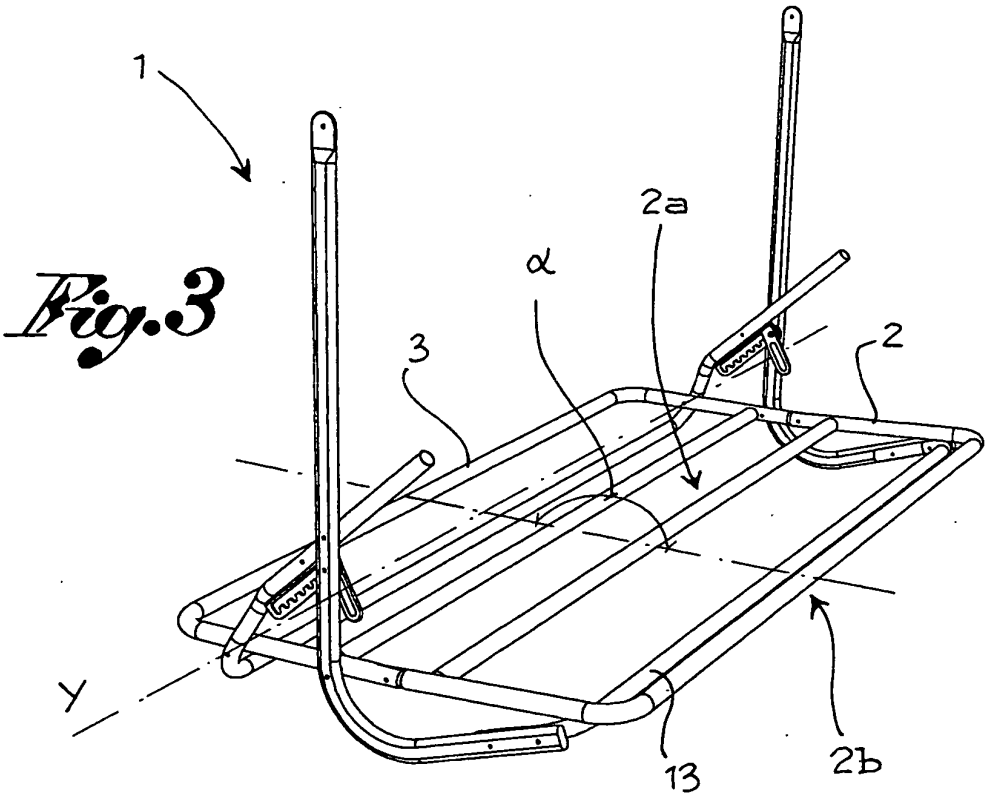


Fig.3

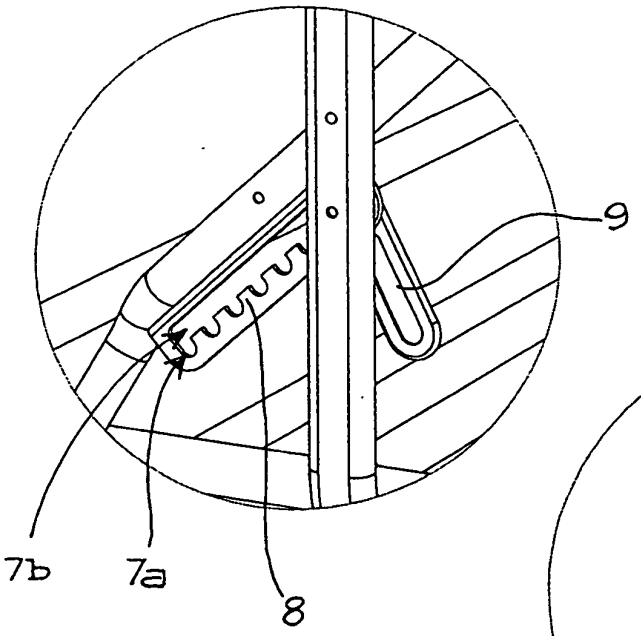


Fig.6a

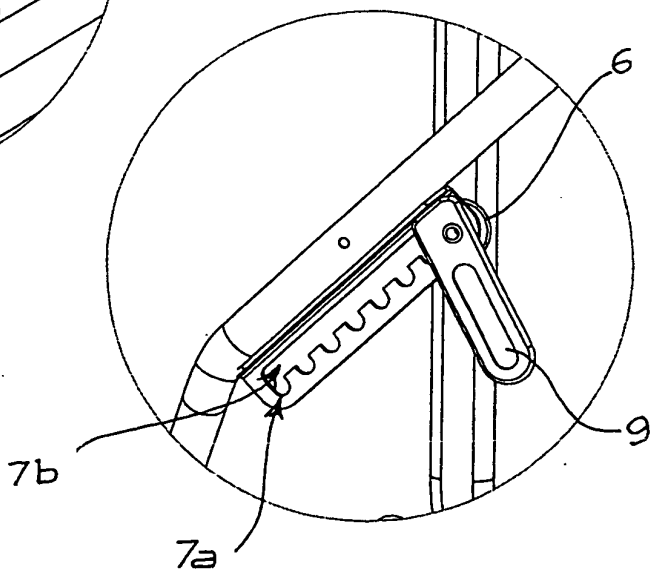


Fig.6b

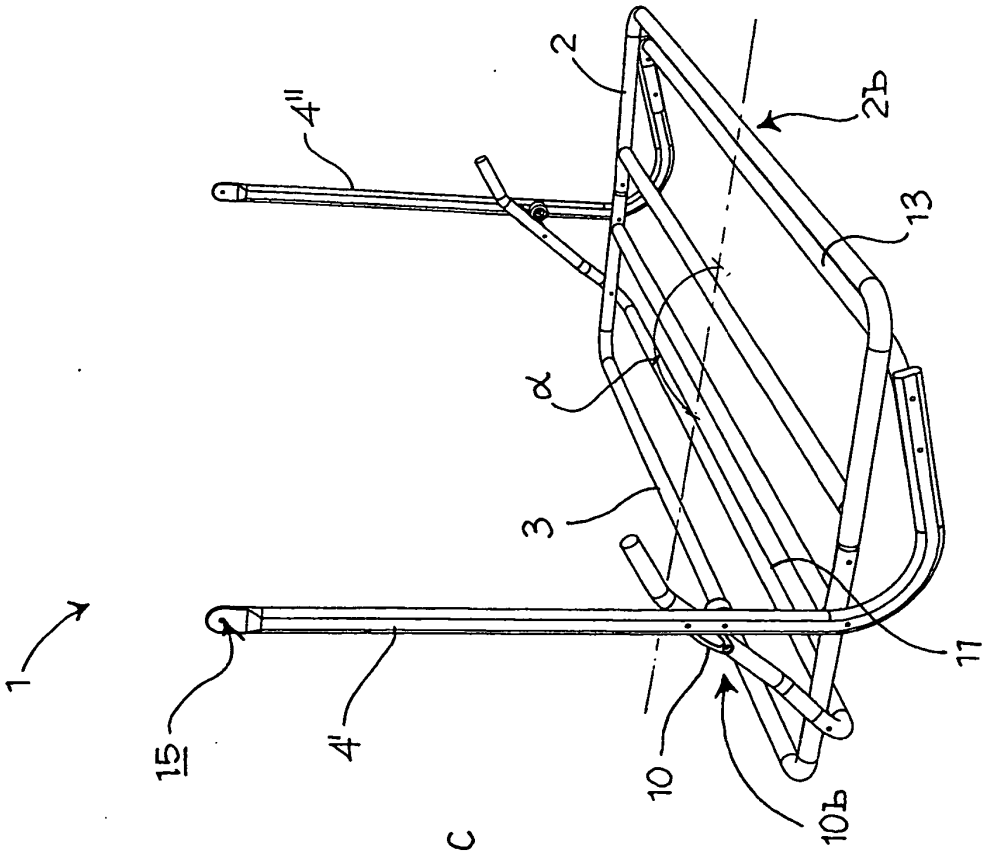


Fig.9

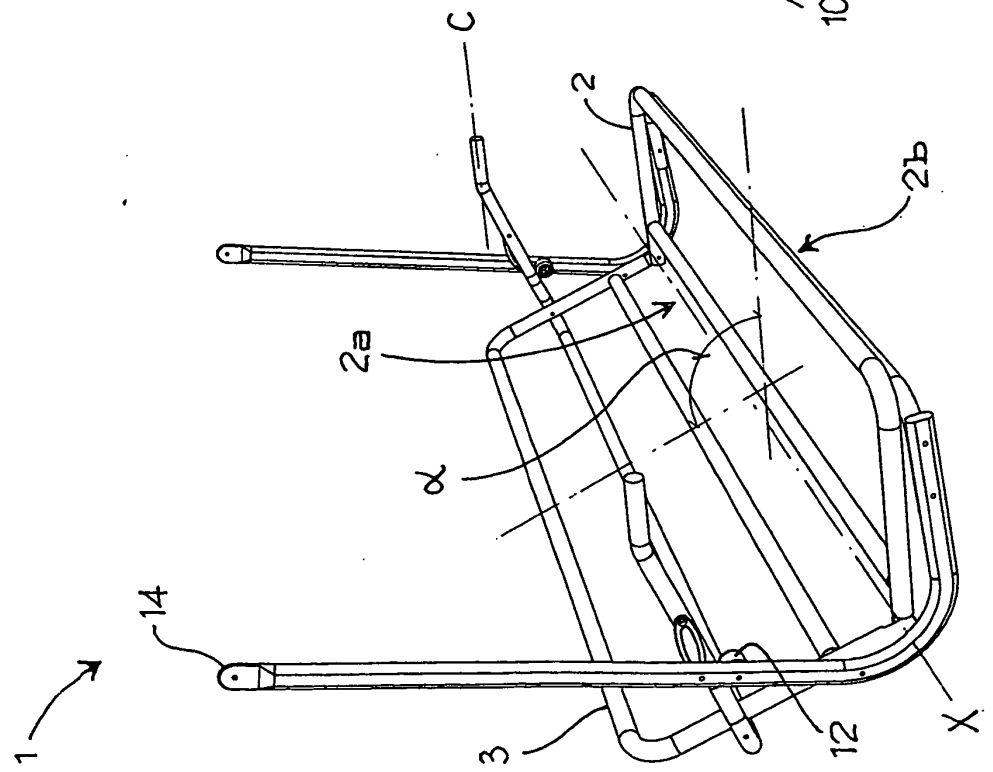


Fig.7

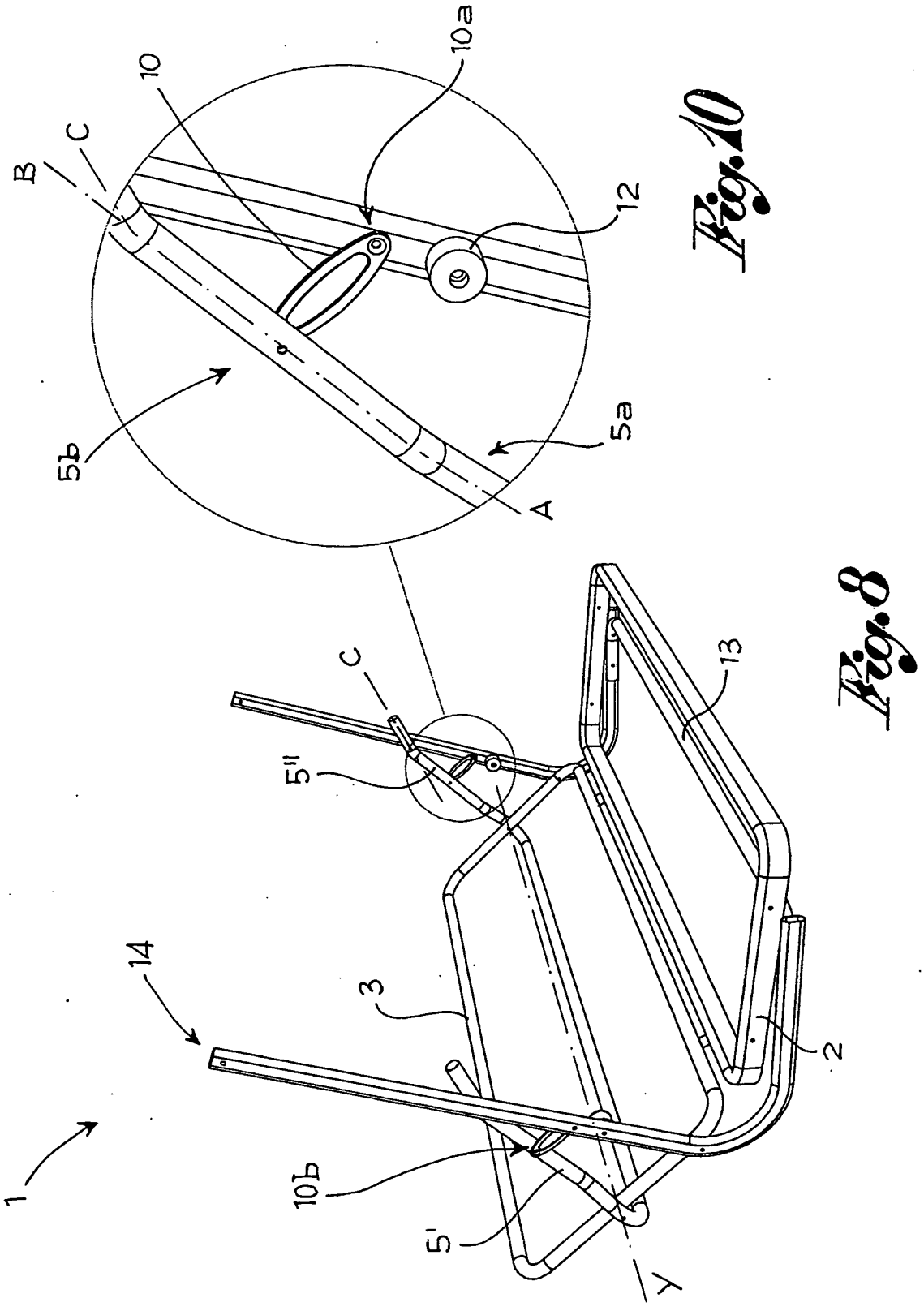


Fig.10

Fig.8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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