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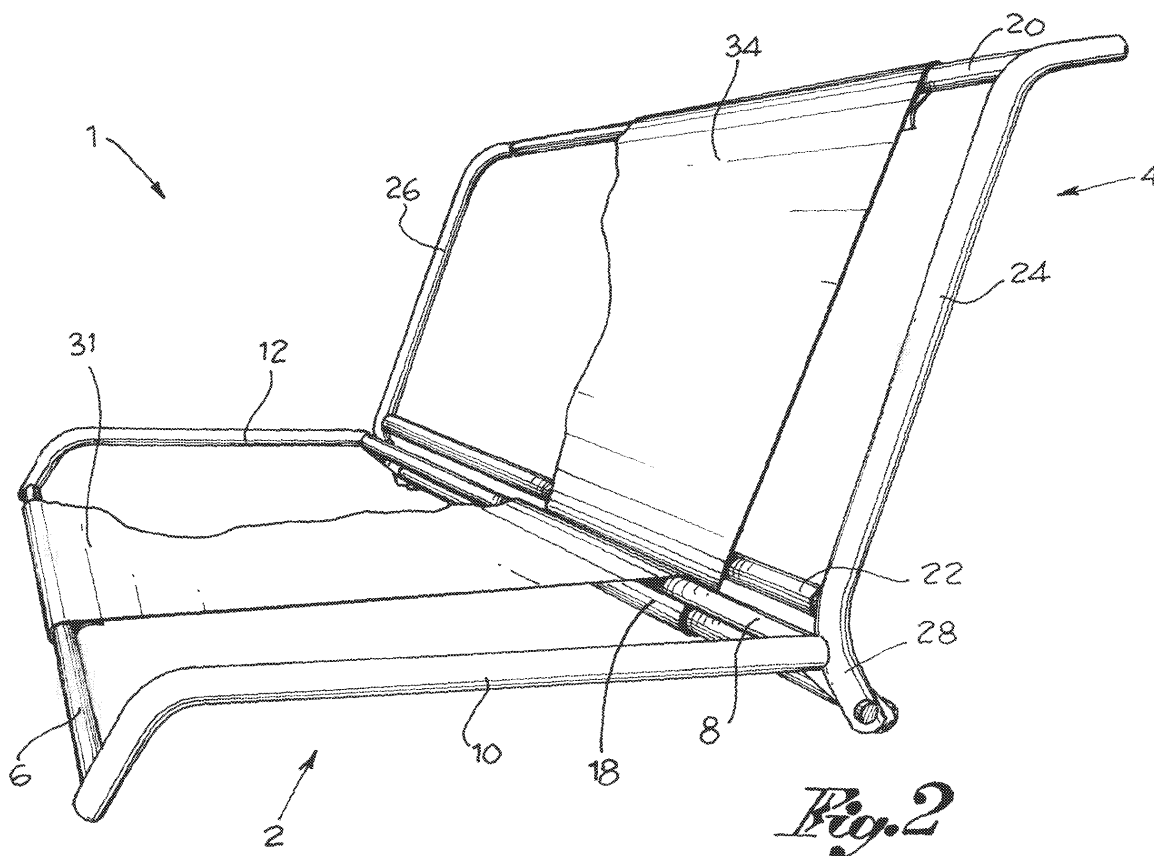
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(54) **A sitting apparatus comprising seat tensioning means**

(57) The present invention relates to a sitting apparatus, such as a chair, an armchair, a deckchair, a rocking chair, a sofa and the like, comprising a frame in two turnable portions (2,4) and a cover sheet. The apparatus comprises stretching means that, when the frame is

opened, allows easily stretching of the sheet. In particular, said stretching means are a portion of the frame itself, so that when the frame is opened, a stretching rod (18) stretches the sheet. There are further provided locking means for keeping the frame in the open configuration.



## Description

**[0001]** The object of the present invention is a sitting apparatus, such as a chair, an armchair, a deckchair, a rocking chair, a sofa and the like, suitable for the sitting of a user.

**[0002]** In particular, the object of the present invention is a sitting apparatus of the type comprising a frame and a sheet, suitable stretched and associated to the frame for forming a portion of seat, suitable for supporting a sitting user, and/or a support portion, such as a back, suitable for supporting a sitting user resting thereon.

**[0003]** In the reference field, the need of effectively stretching the sheet and associating it to the frame, keeping it stretched, is strongly felt, for forming the desired sitting apparatus.

**[0004]** A known method, for example for making rocking chairs, provides for associating a first edge of the sheet to a first rod of the frame, suitably pulling a second edge, opposite the first one, for stretching the sheet, and associating the second edge to a second rod of the frame.

**[0005]** As it can be understood, said method is difficult to effect and such as to considerably slow down the rocking chair manufacturing process and most of the times, such as to need the manual intervention of dedicated workers.

**[0006]** A further method, for example used for making deckchairs, provides for providing an intermediate rod of the frame with a plurality of springs, attaching the unstretched sheet to two end rods of the frame, and then stretching the sheet coupling it, generally at its centre line, to said springs.

**[0007]** Such method exhibits the disadvantage of having to provide for suitable springs coupled to the frame, of having to provide for a sheet provided with a coupling portion to which the springs must be associated. Very often, moreover, the springs used, of a small size, are subject to breakage, and the additional portion of the sheet, to which the springs are connected, is subject to breakage and tearing.

**[0008]** The object of the present invention is to make a sitting apparatus comprising a frame and a sheet which should overcome the disadvantages mentioned with reference to the prior art while meeting the above requirements.

**[0009]** Such object is achieved by a sitting apparatus in accordance with claim 1. The dependent claims describe further embodiments.

**[0010]** The features and advantages of the sitting apparatus according to the present invention will appear more clearly from the following description, made with reference to the annexed figures, wherein:

**[0011]** - figure 1 shows a perspective view of a frame of a sitting apparatus comprising a frame and a sheet, in a closed configuration;

**[0012]** - figure 2 shows the frame of figure 1, in an open configuration; and

**[0013]** - figures 3a to 3b show a sequence of passage

of the frame of figures 1 and 2 from the closed configuration to the open configuration.

**[0014]** For clarity of explanation, in the following description reference is made to a rocking chair. It is understood, however, that the described invention can be applied to a general sitting apparatus, such as a chair, an armchair, a deckchair and more.

**[0015]** With reference to the annexed drawings, reference numeral 1 globally indicates a frame of a rocking chair, comprising a frame portion for sitting 2 and a frame portion for resting 4.

**[0016]** Said frame portion for sitting is intended for supporting a sitting user; said frame portion for resting is intended for supporting a sitting user resting thereon, for example making a back.

**[0017]** The frame portion for sitting 2 and the frame portion for resting 4 are hinged, that is, they are coupled to each other so as to allow the relative rotation about an axis of rotation X-X. Said axis of rotation X-X defines a longitudinal direction for the frame; a direction perpendicular to said longitudinal direction is defined as cross direction.

**[0018]** The frame portion for sitting 2 comprises an outer longitudinal rod 6 and, transversally spaced therefrom, an inner longitudinal rod 8. Moreover, said frame portion for sitting 2 comprises a first cross rod 10 and, longitudinally spaced therefrom, a second cross rod 12.

**[0019]** The outer longitudinal rod 6 is connected at the ends thereof to said cross rods 10, 12 and said cross rods 10, 12 are each connected to the ends of said inner longitudinal rod 8, forming a quadrangular structure.

**[0020]** Moreover, the frame portion for sitting 2 comprises a first hinge element 14 and a second hinge element 16. Said hinge elements 14, 16 are each connected to the respective cross rod 10, 12.

**[0021]** Moreover, the frame portion for sitting 2 comprises a longitudinal stretching beam 18, connected at the ends to said hinge elements 14, 16.

**[0022]** The frame portion for resting 4 comprises an upper longitudinal rod 20 and, spaced therefrom, a lower longitudinal rod 22. Moreover, said frame portion for resting 4 comprises a first side rod 24 and, longitudinally spaced therefrom, a second side rod 26.

**[0023]** The upper longitudinal rod 20 is connected at the ends thereof to said side rods 24, 26 and said side rods 24, 26 are each connected to the ends of said lower longitudinal rod 22, forming a quadrangular structure.

**[0024]** Said side rods 24, 26 comprise hinge extensions 28, 30, which extend beyond the connection points of said side rods 24, 26 to said stretching rod 18.

**[0025]** The respective connection between said hinge extensions 28, 30 of the frame portion for resting 4 to said hinge elements 14, 16 of the frame portion for sitting 2 allow said hinging.

**[0026]** The rocking chair further comprises a sheet suitable for being associated to said frame for forming a sitting portion, on which, for example, cushions may be arranged, and/or a resting portion, that is, a back.

**[0027]** The sheet exhibits an outer longitudinal edge and an upper longitudinal edge.

**[0028]** The outer longitudinal edge of the sheet is connected to the outer longitudinal rod 6 of the frame portion for sitting 2. For example, said edge is threaded on said rod.

**[0029]** The upper longitudinal edge of the sheet is connected to the upper longitudinal rod 20 of the frame portion for resting 4. For example, said edge is threaded on said rod.

**[0030]** In a closed configuration of the frame (figure 1), wherein the frame portion for resting is at least partly overlapped to the frame portion for sitting, the sheet, from the outer longitudinal edge towards the upper longitudinal edge, is connected by its outer longitudinal edge to the outer longitudinal rod 6 of the frame portion for sitting, and partly winds about the inner longitudinal rod 8, so as to go beyond the quadrangular structure of the frame portion for sitting.

**[0031]** Moreover, the sheet partly winds about the lower longitudinal rod 22 and is connected by its upper longitudinal edge to the upper longitudinal rod 20 of the frame portion for resting, so as to go out of the quadrangular structure of the frame portion for resting.

**[0032]** In said closed configuration, it is possible to see a sheet portion between the outer longitudinal rod 6 and the inner longitudinal rod 8, called sheet portion for sitting 31; a sheet portion between the inner longitudinal rod 8 and the lower longitudinal rod 22, called active portion 32; a sheet portion between the inner longitudinal rod 22 and the upper longitudinal rod 20, called sheet portion for resting 34.

**[0033]** In an open configuration, said frame portion for resting exhibits a rotated arrangement relative to the arrangement taken in said closed configuration.

**[0034]** In said open configuration, said active portion 32 of the sheet is influenced by said stretching rod 18, in particular it is pushed thereby between the inner longitudinal beam 8 and the lower longitudinal beam 22, so as to stretch the sheet (figure 3).

**[0035]** The rocking chair further comprises locking means, suitable for locking the frame portion for sitting and the frame portion for resting in a predetermined relative angular position, in order to make said frame usable in the open configuration.

**[0036]** In a preferred embodiment, the rocking chair comprises covering means, such as a cushion, suitable for being arranged on said sheet in said open configuration of the frame.

**[0037]** As it can be understood, a man skilled in the art can make several changes to the invention described above in order to meet specific and incidental needs.

**[0038]** For example, in replacement of or in combination with the sheet, a variation of embodiment provides for the use of a plurality of wires, properly connectable to the outer longitudinal rod of the sitting portion of the frame and to the lower longitudinal rod of the resting portion of the frame, for example by hooks.

**[0039]** In a further variation of embodiment, the stretching rod is connected to the resting portion of the frame.

**[0040]** Such variations are also to be regarded as falling within the scope of protection as defined by the following claims, according to which, as clarified by the above description of an example of embodiment, a sitting apparatus, such as a chair, an armchair, a deckchair, a rocking chair, a sofa and the like, is protected, comprising:

**[0041]** - a frame comprising a frame portion for sitting and a frame portion for resting, said frame portions being hinged to one another in a way suitable for allowing a relative rotation about a longitudinal axis of rotation X-X, for moving from a closed configuration to an open configuration;

**[0042]** - support means, cooperating with said frame, suitable for forming a support suitable for supporting the action of a user sitting on said apparatus, said support comprising at least one support element, that is said frame or said wires, suitable for being stretched for imparting a desired stiffness thereto;

**[0043]** wherein the apparatus comprises stretching means, such as the stretching rod 18, suitable for moving from a passive configuration to an active configuration wherein they influence said support means, forming said support stretching said at least one support element for obtaining said desired stiffness.

**[0044]** Moreover, said stretching means are coupled to said frame, so that said closed configuration of the frame also forms said passive configuration of the stretching means and said open configuration of the frame also forms said active configuration of the stretching means.

**[0045]** Advantageously, the frame opening also allows the activation of the stretching means, thus preventing further operations.

**[0046]** Moreover, said stretching means change from said passive configuration to said active configuration through a rotation that brings said stretching means to influence said support means.

**[0047]** Moreover, in said passive configuration of the stretching means, said at least one portion of said support element extends between said inner longitudinal rod 8 and said lower longitudinal rod 22.

**[0048]** Advantageously, said portion is arranged in such position as to be easily influenced by the action of the stretching means.

**[0049]** Moreover, the geometrical axis of said inner longitudinal rod 8 and the geometrical axis of said lower longitudinal rod 22 define a geometrical separation plane, suitable for determining a passive half-space and an active half-space, in said passive configuration of the stretching means, said stretching rod being at least partly arranged in said passive half-space.

**[0050]** Moreover, in said active configuration of the stretching means, said stretching rod is at least partly arranged in said active half-space, for stretching said at least one support element.

[0051] Moreover, when said frame is arranged in a configuration suitable for the normal use, said cross rods 10, 12 define a geometrical sitting plane.

[0052] Moreover, in said active configuration of the stretching means, said stretching rod 18 is external to said geometrical sitting plane, for preventing the sitting user from perceiving the presence of said rod.

[0053] Moreover, when said frame is arranged in a configuration suitable for the normal use, said side rods 24, 26 define a geometrical resting plane.

[0054] Moreover, in said active configuration of the stretching means, said stretching rod 18 is external to said geometrical resting plane, for preventing the sitting user resting on the back from perceiving the presence of the rod.

[0055] Advantageously, the invention described above allows industrially speeding up the production of chairs, armchairs, deckchairs, rocking chairs and the like, of the type with frame and support sheet.

[0056] According to a further advantageous aspect thereof, the invention described above allows obtaining sitting apparatus with stretched sheet at home in a simple and quick manner.

[0057] A further advantageous aspect thereof consists in that, by acting on the frame for actuating said stretching means as well, the lever effect due to the frame dimensions is advantageously used, thus strongly stretching the sheet using a relatively weak force.

## Claims

1. A sitting apparatus, such as a chair, an armchair, a deckchair, a rocking chair, a sofa and the like, comprising:

- a frame (1) comprising a frame portion for sitting (2) and a frame portion for resting (4), said frame portions being hinged to one another in a way suitable for allowing a relative rotation about a longitudinal axis of rotation (X-X), for changing from a closed configuration to an open configuration;
- support means, cooperating with said frame, suitable for forming a support suitable for supporting the action of a user sitting on said apparatus, said support comprising at least one support element suitable for being stretched for imparting a desired stiffness thereto;

said apparatus being **characterised in that** it further comprises stretching means suitable for changing from a passive configuration to an active configuration wherein they influence said support means, forming said support stretching said at least one support element for obtaining said desired stiffness.

2. An apparatus according to claim 1, wherein said

stretching means are coupled to said frame, so that said closed configuration of the frame also forms said passive configuration of the stretching means and said open configuration of the frame also forms said active configuration of the stretching means.

3. An apparatus according to claim 1 or 2, wherein said stretching means change from said passive configuration to said active configuration through a rotation that brings said stretching means to influence said support means.

4. An apparatus according to claim 3, wherein said rotation can be carried out about said longitudinal axis of rotation (X-X), and wherein said stretching means comprise a stretching rod (18), parallel to said longitudinal axis.

5. An apparatus according to claim 3 or 4, wherein said sitting portion (2) of the frame (1) comprises an inner longitudinal rod (8) and said support portion (4) of the frame (1) comprises a lower longitudinal rod (22), in said passive configuration of the stretching means, said at least one support element extending between said inner longitudinal rod (8) and said lower longitudinal rod (22).

6. An apparatus according to claim 5, wherein the geometrical axis of said inner longitudinal rod (8) and the geometrical axis of said lower longitudinal rod (22) define a geometrical separation plane, suitable for determining a passive half-space and an active half-space, in said passive configuration of the stretching means, said stretching rod being at least partly arranged in said passive half-space.

7. An apparatus according to claim 6, wherein in said active configuration of the stretching means, said stretching rod is at least partly arranged in said active half-space, for stretching said at least one support element.

8. An apparatus according to any one of claims 4 to 7, wherein said sitting portion (2) of the frame (1) exhibits a structure transversely delimited by cross rods (10,12), wherein, when said sheet is arranged in a configuration suitable for the normal use thereof, said cross rods define a geometrical sitting plane.

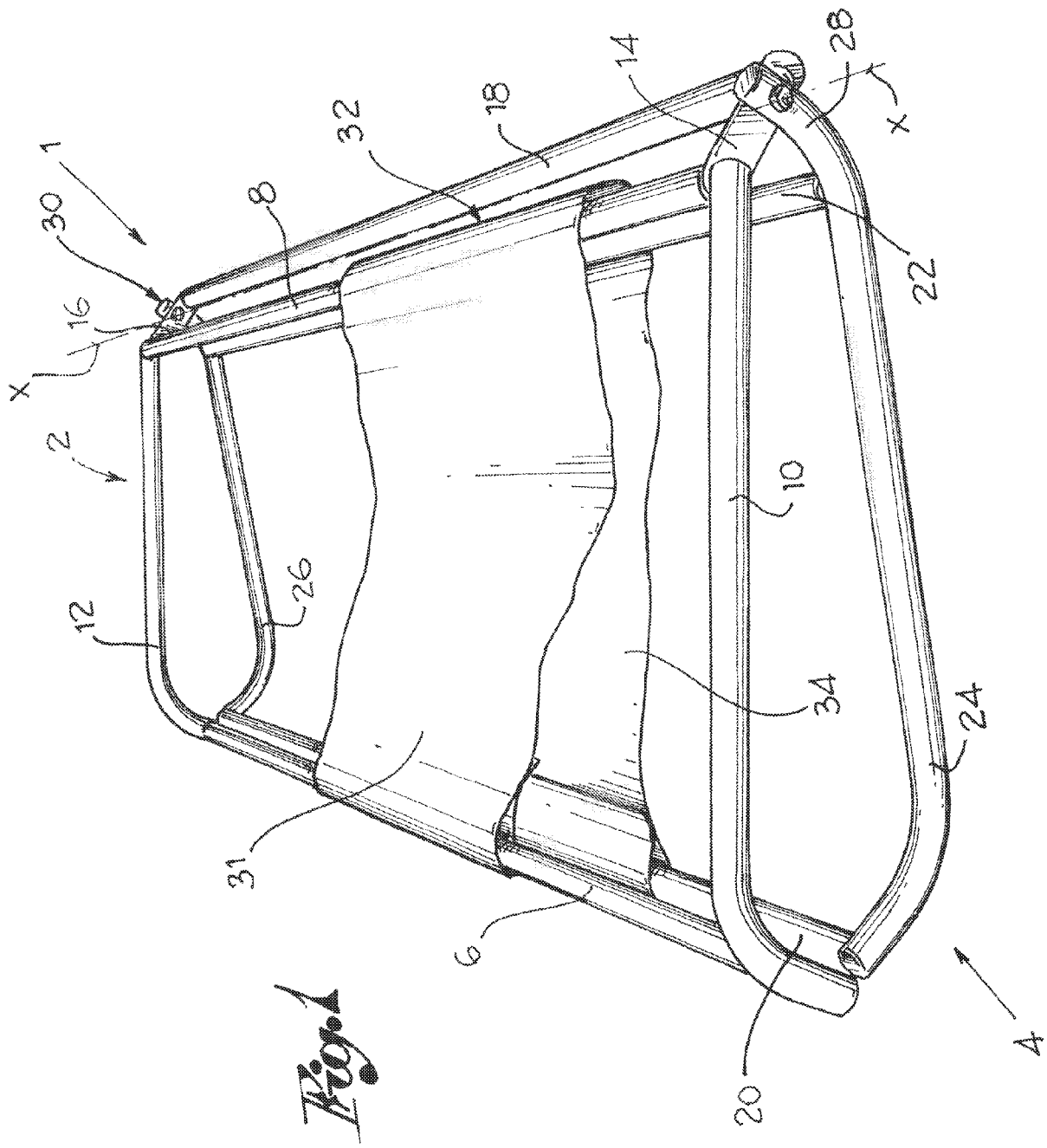
9. An apparatus according to claim 8, wherein in said active configuration of the stretching means, said stretching rod (18) is external to said geometrical sitting plane.

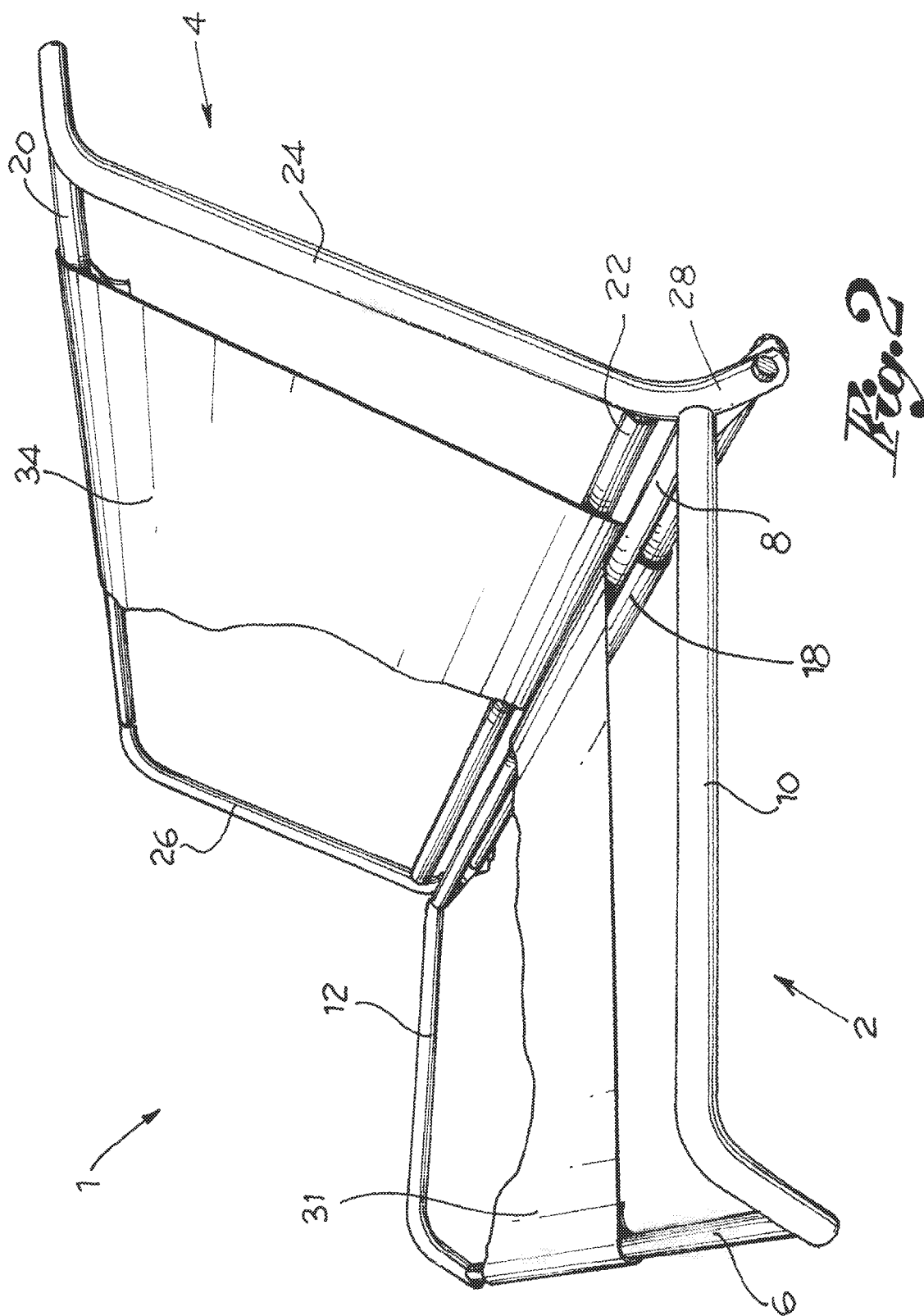
10. An apparatus according to claim 8 or 9, wherein said sitting portion (2) of the frame (1) comprises hinge elements (14,16), longitudinally spaced from one another, and said stretching rod (18), connected at the

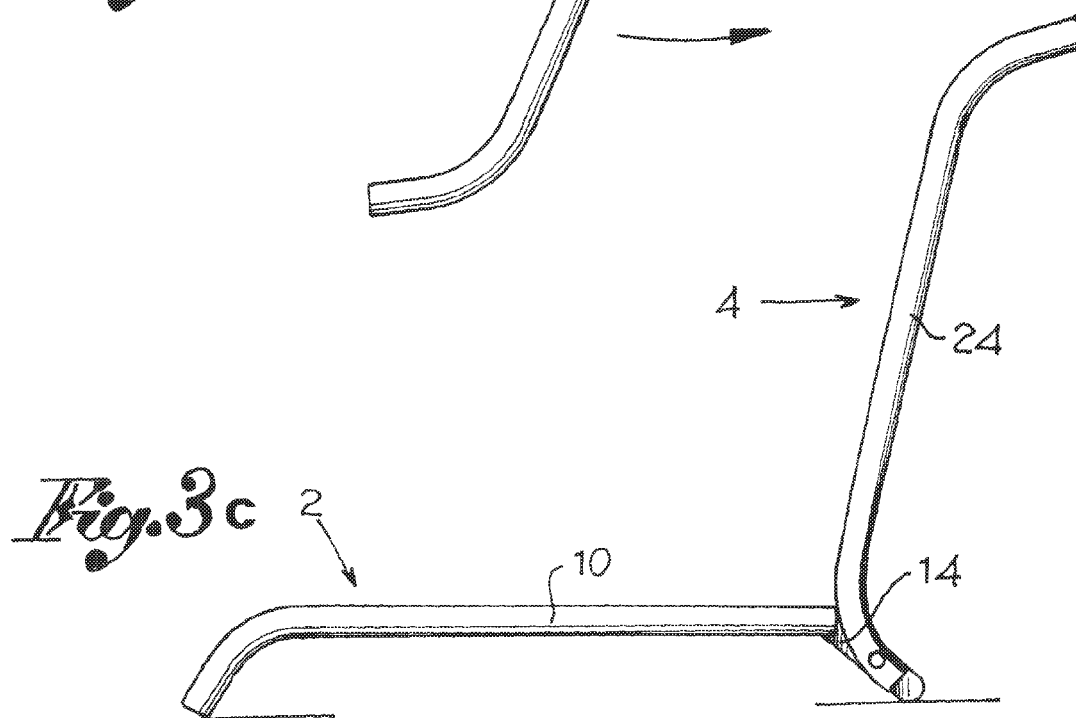
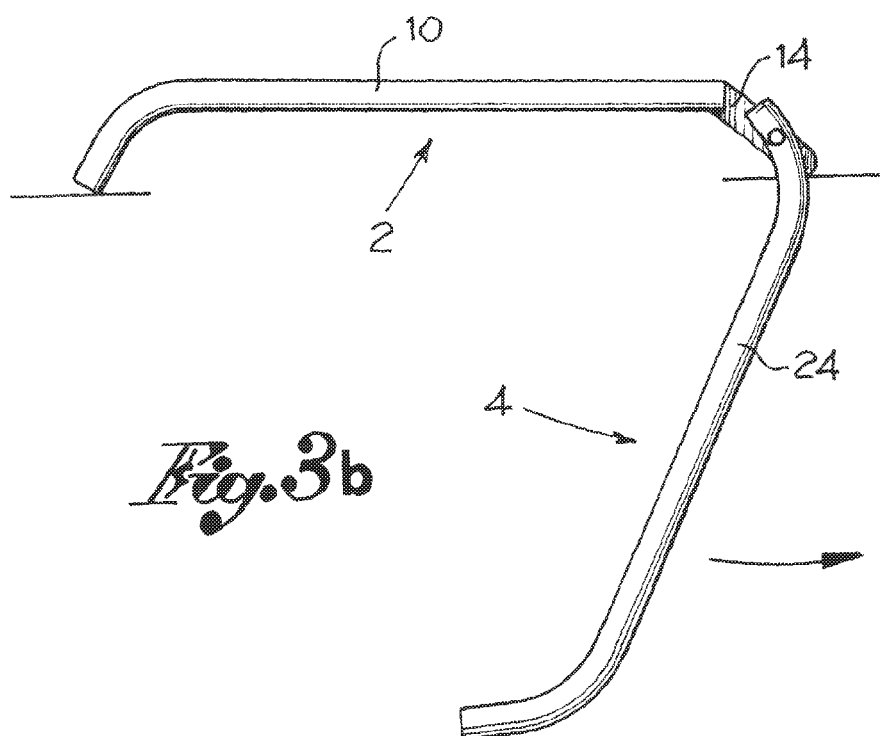
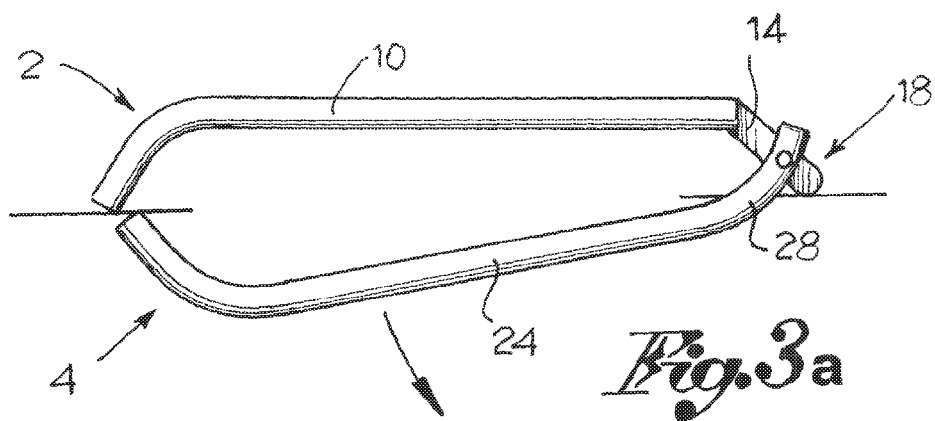
ends thereof to said hinge elements (14,16), said stretching rod (18), in said closed configuration of the frame, being arranged out of said sitting plane.

11. An apparatus according to any one of claims 4 to 10, wherein said resting portion (4) of the frame (1) exhibits a structure transversely delimited by side rods (24, 26), wherein, when said sheet is arranged in a configuration suitable for the normal use thereof, said side rods define a geometrical resting plane. 5 10
12. An apparatus according to claim 11, wherein in said active configuration of the stretching means, said stretching rod (18) is external to said geometrical resting plane. 15
13. An apparatus according to any one of the previous claims, further comprising locking means suitable for locking the frame portion for sitting (2) and the frame portion for resting (4) in a predetermined relative angular position, in order to make said frame usable in the open configuration. 20
14. An apparatus according to any one of the previous claims, wherein said at least one support element of said support means consists of at least one sheet. 25
15. An apparatus according to any one of claims 1 to 13, wherein said at least one support element consists of at least one wire. 30
16. An apparatus according to any one of the previous claims, comprising covering means, such as at least one cushion, suitable for being arranged on said sheet in said open configuration of the frame. 35
17. A method for making a sitting apparatus, such as a chair, an armchair, a deckchair, a rocking chair, a sofa and the like, made in accordance with any one of the previous claims, wherein said method comprises the steps of: 40
  - arranging the frame in the closed configuration;
  - associating said at least one support element to the sitting portion of the frame and to the resting portion of the frame, so that at least one portion of said support element can be influenced by said stretching means; 45
  - rotating said sitting portion relative to said resting portion, for bringing said frame from the closed configuration to the open configuration; 50
  - actuating said stretching means, for stretching said at least one support element, forming said support for sitting and/or for back. 55
18. A method according to claim 17, wherein said rotation step is carried out at the same time as said actuating step.

19. A method according to claim 17 or 18, further comprising a step of relatively releasing said sitting portion and said resting portion of the frame for keeping said open configuration of the frame.









| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                    |                                                                                                                                                 |                                                                                                                                                                                                                                                                                       |                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| Category                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                                                   | Relevant to claim                                                                                                                                                                                                                                                                     | CLASSIFICATION OF THE APPLICATION (IPC) |
| X                                                                                                                                                                                                                                                      | US 1 947 410 A (EMERSON LILLEY W)<br>13 February 1934 (1934-02-13)<br><br>* page 1, line 44 - page 1, line 64 *<br>* figures 1-3 *<br>-----     | 1-5,8,<br>11,13,<br>14,16,<br>17,19                                                                                                                                                                                                                                                   | INV.<br>A47C4/28                        |
| X                                                                                                                                                                                                                                                      | GB 628 446 A (WILFRED LAURENCE GUYON<br>WILTSHIRE) 29 August 1949 (1949-08-29)<br>* page 2, line 85 - page 3, line 53 *<br>* figures *<br>----- | 1,2,13,<br>14,17                                                                                                                                                                                                                                                                      |                                         |
| X                                                                                                                                                                                                                                                      | GB 318 354 A (EDWARD GEORGE WELLS)<br>5 September 1929 (1929-09-05)<br>* page 2, line 92 - page 3, line 115 *<br>* figures *<br>-----           | 1-3,14,<br>17                                                                                                                                                                                                                                                                         |                                         |
| X                                                                                                                                                                                                                                                      | US 1 933 040 A (BAKER HAROLD E)<br>31 October 1933 (1933-10-31)<br>* page 1, line 54 - page 1, line 98 *<br>* figures 1-6 *<br>-----            | 1,17                                                                                                                                                                                                                                                                                  |                                         |
| A                                                                                                                                                                                                                                                      | GB 789 623 A (GEOFFREY WILSON MOTT)<br>22 January 1958 (1958-01-22)<br>* figures *<br>-----                                                     | 1-19                                                                                                                                                                                                                                                                                  |                                         |
|                                                                                                                                                                                                                                                        |                                                                                                                                                 |                                                                                                                                                                                                                                                                                       | TECHNICAL FIELDS<br>SEARCHED (IPC)      |
|                                                                                                                                                                                                                                                        |                                                                                                                                                 |                                                                                                                                                                                                                                                                                       | A47C                                    |
| The present search report has been drawn up for all claims                                                                                                                                                                                             |                                                                                                                                                 |                                                                                                                                                                                                                                                                                       |                                         |
| Place of search<br><b>Munich</b>                                                                                                                                                                                                                       |                                                                                                                                                 | Date of completion of the search<br><b>18 July 2006</b>                                                                                                                                                                                                                               | Examiner<br><b>MacCormick, D</b>        |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |                                                                                                                                                 | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |                                         |

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

EP 06 10 0966

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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18-07-2006

| Patent document<br>cited in search report |   | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|---|---------------------|----------------------------|---------------------|
| US 1947410                                | A | 13-02-1934          | NONE                       |                     |
| GB 628446                                 | A | 29-08-1949          | NONE                       |                     |
| GB 318354                                 | A | 05-09-1929          | NONE                       |                     |
| US 1933040                                | A | 31-10-1933          | NONE                       |                     |
| GB 789623                                 | A | 22-01-1958          | NONE                       |                     |