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Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number:

0 211 407
A2

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 86110609.4

(51) Int. Cl. 4: A47C 7/50 , A47C 4/22

(22) Date of filing: 31.07.86

(30) Priority: 06.08.85 IT 2274385 U

(43) Date of publication of application:
25.02.87 Bulletin 87/09(84) Designated Contracting States:
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(54) Folding chair structure.

(57) A folding chair frame comprising a first seat frame (1), a second backrest frame (2) hinged to the former, front and rear supporting legs (5, 6) hinged to seat frame (1) and to lateral armrests (4), and a footrest frame (3) slidingly supported by lower bar portions (1b) of U-shaped lateral arms of the seat frame, the arms have upper bar portions (1a) parallel arranged to the lower portions (1b) and are connected to a crosswise portion (1c) of the seat frame (1).

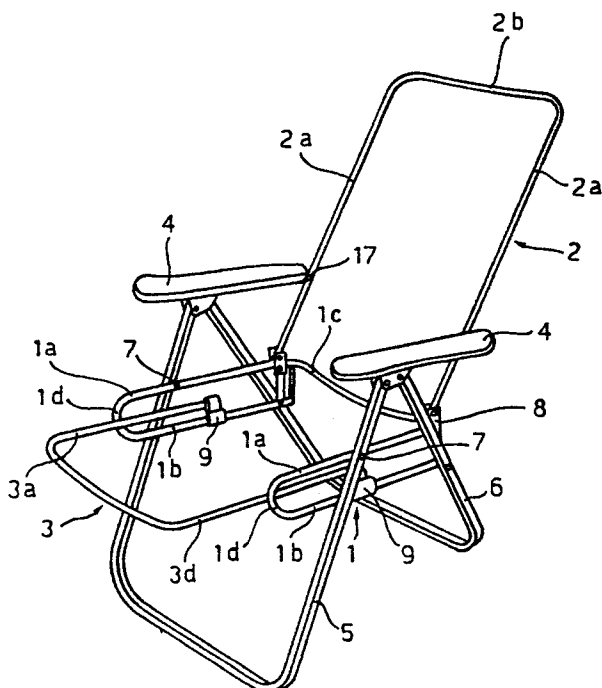


Fig. 1

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Folding chair structure

Folding chairs are available on the market, which comprise a first metal frame defining the seat, a second metal frame defining the backrest, said frames being hinged together and to supporting legs, respectively, to lateral armrests, to permit the opening and closing of the chair, and a third metal frame for the footrest, slidingly supported, which can be pulled out and in from the front of the seat frame.

The chairs of the above-mentioned type are generally rather complicated in structure, due to the fact that they are made up of several tubular elements welded together or otherwise connected, with a considerable waste of time and cost. In particular, the seat frame comprises several tubular members joined securely together, beneath which is provided an auxiliary frame for movably supporting the footrest. This structural solution of the chair which entails a double frame for the seat and for supporting the footrest, in addition to the aforesaid problems, also makes it difficult to modify or adapt the chair to various requirements in terms of appearance and design. Moreover, the footrest frame is welded to metal guide sleeves which, in addition to limiting the positioning of the footrest, scratch the guide frame, immediately causing rust to form where the protective paint has been removed.

An object of this invention is to provide a folding chair, of the aforesaid type, which is capable of overcoming the above-mentioned problems, that is to say, which is simple in structure, is less expensive to produce and to assemble, and at the same time allows greater freedom of design, thanks to the particular conformation of the seat frame, which also supports the footrest.

According to this invention, a folding chair structure with a slide-out footrest is thus provided, said chair comprising a first seat frame and a second backrest frame which are hinged together and to supporting legs and, respectively, to lateral armrests, to permit the opening and closing of the chair, characterized by the fact of comprising a C-shaped tubular seat frame having a cross portion and two U-shaped lateral arms, each U-shaped arm comprising an upper bar portion connected to the intermediate crosswise portion and a lower bar portion parallelly arranged beneath the first one, said lower bar portion having a free end, and connecting means between said free ends of the lower bar portions and said upper bar portions, and support members for the footrest frame, said support members being made of low-friction material, and sliding along the lower bar portions of the lateral arms of the seat frame.

The folding chair according to this invention will be illustrated in greater detail hereunder, with reference to the figures in the accompanying drawings, in which:

Fig. 1 shows a perspective view of a chair frame, in which the covering panels for the backrest, seat and footrest frames have been omitted;

Fig. 2 shows a side view of the chair frame of fig. 1;

Fig. 3 shows a detail illustrating the hinge system between the backrest frame, the seat frame and a rear leg of the chair;

Fig. 4 shows a cross-sectional view along the line 4-4 of figure 5, illustrating the hinge system between the legs and the lateral armrests;

Fig. 5 shows a cross-sectional view along the line 5-5 of figure 4.

As shown in the figures, the folding chair comprises a first seat frame 1, made from a single suitably bent tubular element, a second backrest frame 2, made from a tubular element, hinged to the rear of the frame 1, to allow a folded or collapsed condition and an unfolded or open condition, and a third footrest frame 3, also made from a tubular element, which pulls out from the front of the chair by sliding along lateral arms of the seat frame 1.

The frames 1 and 2 of the chair are hinged to lateral armrests 4 and to front and rear legs 5,6, as shown, so as to allow the folding chair to be opened and folded, in the usual way. The chair is completed by panels, not shown, fitted onto the aforesaid frames 1, 2 and 3.

In particular, as shown in figures 1 and 2, the backrest frame 2 consists of a C-shaped tubular metal element, in which the two arms 2a of the C are joined together at their upper ends by means of a crosswise portion 2b, and in which the lower free ends of the arms 2a are hinged to brackets 2 which, in turn, are secured to the rear of the seat frame 1. The seat frame 1 is in turn hinged by pin 7 to the front legs 5 which are made from a C-shaped metal section, and is also hinged to the rear legs 6, which are shaped similarly to the front legs, by means of connecting levers 8 provided on the upper end with a rest head 8a which comes to rest against the leg 6, in the open condition of the chair shown in figures 1 and 3.

As mentioned previously, the improvement of the chair frame according to this invention, consists in a particular conformation of the seat frame 1, and in the supporting system of the footrest frame 3, which have made it possible to simplify the structure of the chair frame considerably, by eliminating the cutting and squeezing operations, as

well as those required for welding the various portions of the tubular elements with which the seat and footrest frames of the folding chairs previously in use were made, and by substituting them with a very small number of much simpler and less expensive bending and riveting operations, thanks to the particular conformation of the seat frame 1.

As shown in figure 1, the seat frame consists of a single C-shaped tubular metal element comprising two laterally spaced U-shaped arms connected to a rear cross portion 1c. Each U-shaped arm comprises an upper bar portion 1a which joins to the crosswise portion 1c, and a second bar portion 1b, parallel to and arranged beneath the first one, which joins together by means of an intermediate bent portion 1d, defining the bottom loop of the U. The lower bar portion 1b of each arm of the frame 1, extends rearwards to a short distance from the crosswise portion 1c, where its free end is connected by a pin 10, to the upper bar portion 1a for both arms, which prevents the lower bar portions 1b from bending under the weight of the feet of the person sitting on the chair, which comes to bear on the partially or completely pulled out footrest 3, thereby ensuring the stability of the footrest and of the chair itself by means of a structurally simple solution.

As mentioned previously, the footrest frame 3 is supported by and slides along the seat frame 1, to enable it to be pulled out from the front of the chair. In this connection, the footrest frame 3 consists of a C-shaped tubular element, whose arms 3a, 3d are parallelly disposed between the U-shaped lateral arms of the frame 1, the arms 3 are connected to sliding elements 9 made of low-frictional material, for example, of "nylon" or other suitable plastic material, so as not to scratch or damage the frame 1, thus preserving it against the formation of rust. In particular, as shown in figure 3, each sliding element 9 comprises a sleeve 9b sliding along the lower bar portion 1b of a respective U-shaped arm of the seat frame 1, and a bushing 9a, which is shorter and joined to the sleeve 9b, into which the free end of a relative arm 3a of the footrest frame 3 is inserted, which end is secured simply by means of a rivet 9c. Due to the possibility of inwardly rotating the two sliding elements 9 supporting the footrest frame, and due to the possibility of choosing any distance whatsoever between the parallel axes of the two sleeves 9a and 9b at the designing stage, it is possible to modify or adapt the dimensions and the position of the footrest frame 3, for example, by bringing it as close as possible to the seat frame, according to specific requirements.

It will be clear, from the foregoing description, that the seat frame 1 and the footrest frame 3 are manufactured and assembled by means of simple operations consisting of merely bending tubular elements and then simply riveting the frame 3 to the sleeves 9, thus substantially reducing manufacturing times and costs and, moreover, giving the chair greater stability, thanks to the elimination of several connecting points. Lastly, from the aesthetical point of view, the chair is much more attractive due to the fact that all the welding and deformation of the tubular elements has been totally eliminated.

Figures 4 and 5 show the hinge and adjusting rack system between the legs 5 and 6 of the chair and the armrests 4, which is made in such a way as to enable the backrest frame 2 to be slanted rearwardly in different angular positions. As shown, the legs 5 and 6, on either side, are hinged by 11 and 12 respectively to a connecting member 13 having a locking head means 14 in the form of a crosswise pin sliding in a longitudinal guide channel 15 of the armrest 4, which opens out downwardly and which is provided internally on both sides of the armrest 4 with toothings 16, or detent means, each tooth having a rear detent face 16a and a front slanting face 16b, so that by lifting the front ends of the armrests and making them slide forward or backward, with respect to the head 14 of the connecting member 13, it is possible to retain the latter in any position of the toothing 16, changing the slant of the backrest as required. A rib 18 on either side of the channel 15, parallel to the toothing 16, prevents the head 14 of the connecting member 13 from accidentally slipping out of the armrest. An alternative solution to the embodiment of fig. 1 comprises a C-shaped seat frame 1, corresponding to the seat frame of fig.1, in which the disposition of the frame 1 is reversed, having the crosswise portion 1c on the front of the chair and the bent portions 1d of the U-shaped arm on the back.

Claims

1. A folding chair structure having a slidably supported footrest frame (3) which can be pulled in and out from the front of the chair, said chair comprising a seat frame (1) and a backrest frame - (2) hinged to the former to allow a folded and unfolded condition, respectively, characterized in that the seat frame (1) comprises a C-shaped tubular member having U-shaped lateral arms, and a crosswise portion (1c), each U-shaped arm comprising an upper bar portion (1a) connected to the crosswise portion (1c), and a lower bar portion - (1b) having a free end, said lower bar portion (1b) being parallelly arranged beneath the upper bar

portion (1a) of the arm; and connecting means (10) between the free ends of said lower bar portions - (1b) and upper bar portions (1a) of said arms; the chair further comprising support members (9) for the footrest frame (3), said support members (9) being freely sliding along the lower bar portions - (1b) of the U-shaped arms of the seat frame (1).

2. A folding chair as claimed in claim 1, in which the footrest frame (3) consists of a C-shaped tubular element connected to supporting elements (9) sliding along the lower bar portions (1b) of the U-shaped lateral arms of the seat frame (1), characterized by the fact that each of said supporting elements (9) comprises a first sleeve member (9b) sliding along the lower bar portion (1b) of the aforesaid arm (1), and a second bushing member -

(9a) connected to the sleeve member (9b), into which the free end of a corresponding arm (3a, 3d) of the C-shaped footrest frame (3) is fitted.

5 3. A folding chair as claimed in claim 1, in which the front and rear legs (5, 6) of the chair are hinged to the lateral armrests (4) by means of a sliding connecting member (13), characterized by the fact that said connecting member (13) comprises a locking head in the form of a crosswise pin
10 (14) sliding in a guide channel (15) open from below the armrest (4), having lateral walls and detent toothing means (16) inside said lateral walls, said toothing means comprising teeth (16) having a rear detent face (16a) and a front slanting face -
15 (16b) for engaging and disengaging said crosswise pin (14) of the connecting member (13).

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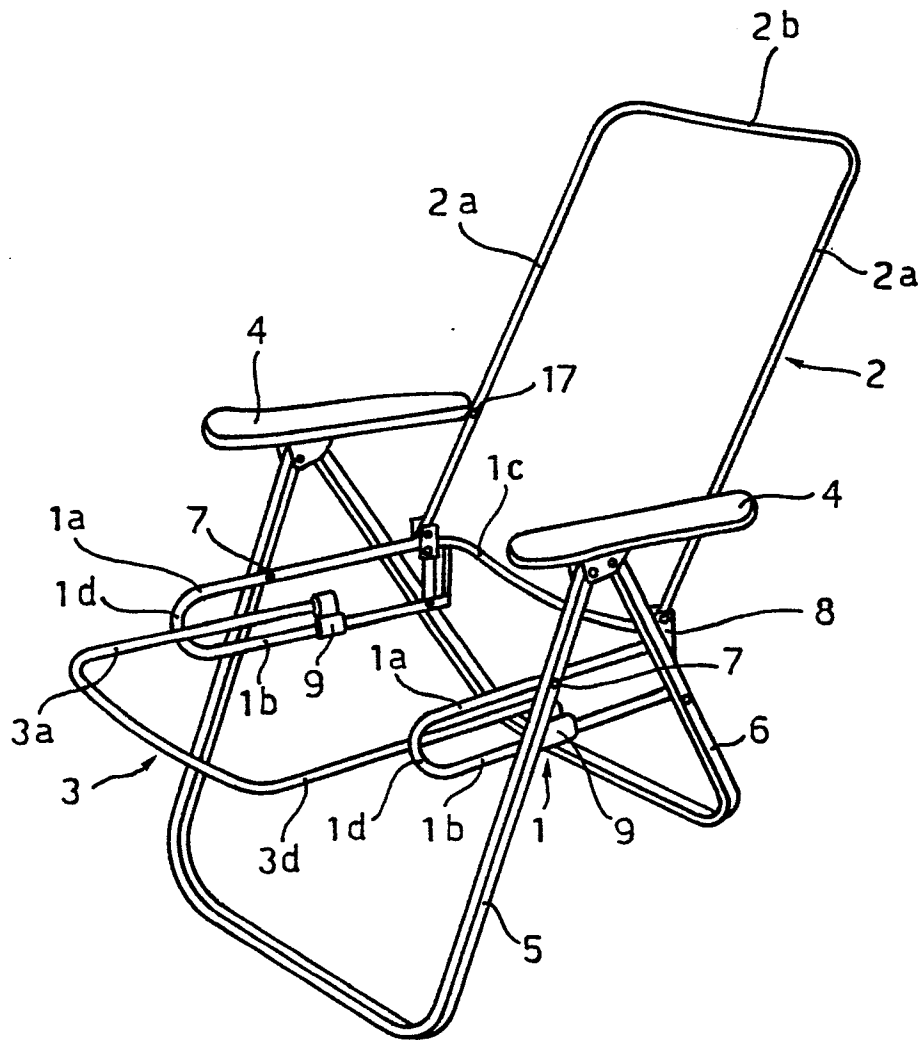


Fig. 1

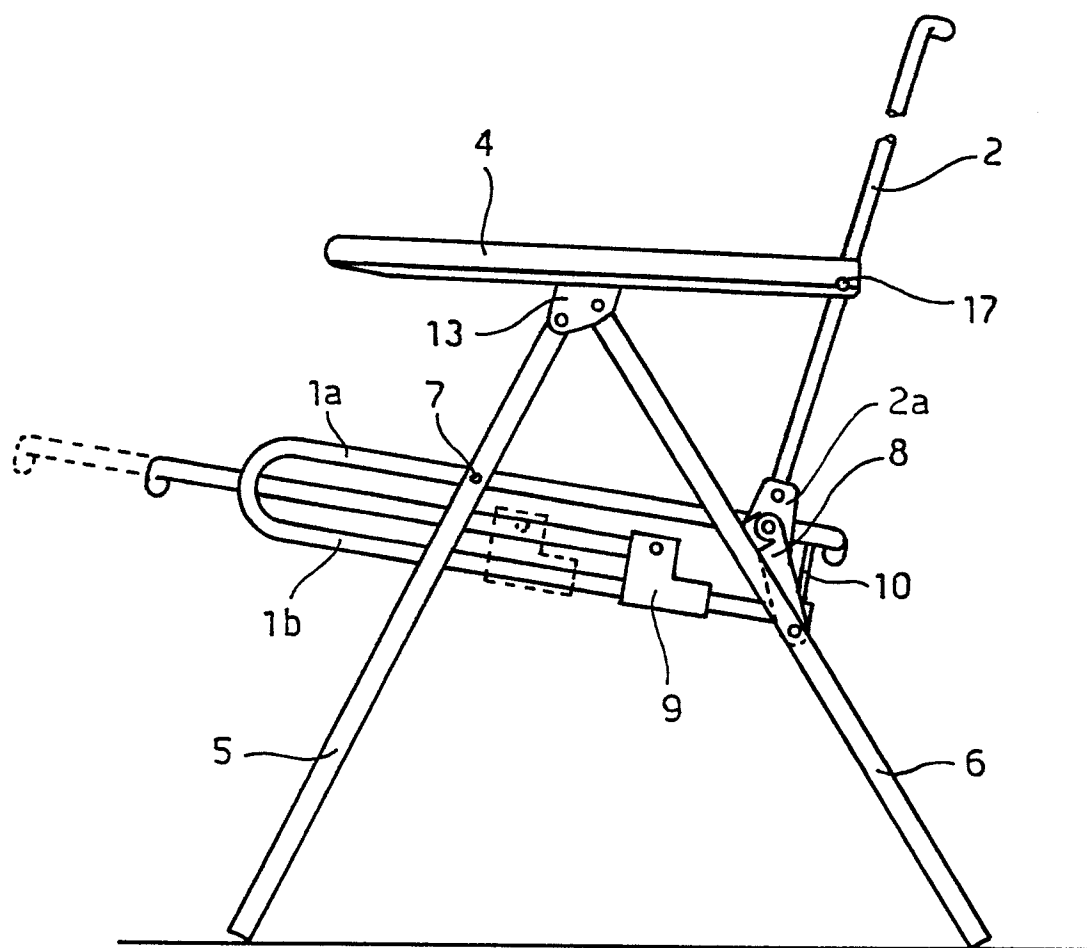


Fig. 2

