

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



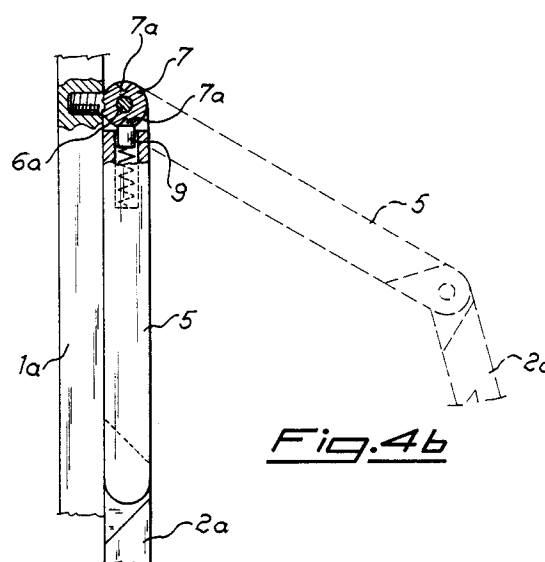
(11) Publication number:

0 533 225 A1

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **92202421.1**(51) Int. Cl.⁵: **A47C 4/20**(22) Date of filing: **05.08.92**(30) Priority: **18.09.91 IT MI910804 U**(43) Date of publication of application:
24.03.93 Bulletin 93/12(84) Designated Contracting States:
AT BE CH DE ES FR GB IT LI LU NL PT(71) Applicant: **TECNO S.p.A. MOBILI E FORNITURE
PER ARREDAMENTO
Via Bigli, 22
Milano(IT)**(72) Inventor: **Kolberg, Justus
Büchenweg 4
Selk(DE)**(74) Representative: **Raimondi, Alfredo, Dott. Ing.
Prof. et al
Dott. Ing. Prof. RAIMONDI ALFREDO S.r.l.
Piazzale Cadorna 15
I-20123 Milano (IT)**(54) **Folding chair with articulating device for full nesting of legs in the closed position.**

(57) A folding chair comprising two pairs of legs (1a, 2a) and a seat (4) articulated to one another, characterized in that between front legs (1a) and rear legs (2a) there is located a locking device (5) having one end rotationally integral with rear leg (2a) and the opposite end rotationally integral with a fixed member (7) projecting transversally from the rear face of front leg (1a), there also being provided locking facilities (8,9,7a) to arrest the rotation of such articulating device (5) at the opposite positions of opening and closure.

**EP 0 533 225 A1**

The object of this invention is a folding chair with an articulating device of plate type shaped in such a way as to allow full nesting of the legs of the chair in the closed position.

There is known to be a need in the furniture industry for furniture units capable of reducing their overall dimensions, either to reduce the volume of packing and therefore the areas used for storing the units, or because of the need to make use of the often scarce usable space in a different manner according to the various requirements which may arise from time to time.

In particular, many attempts have been made to develop folding chairs capable of being opened and deployed in the place of use only when necessary and subsequently reduced to the smallest possible dimensions for removal to store-rooms or like places out of sight.

The known designs, however, display certain disadvantages such as the heaviness of the structure, the complicated nature of the closing devices, the lack of safety features ensuring retention in the various positions, and the inability to achieve full nesting of the seat and frame so as to minimize the overall dimensions.

There is therefore posed the problem of developing a folding chair of low weight, equipped with simple and compact closing devices which can be easily operated, but at the same time having safety features capable of ensuring retention in the open and closed positions respectively. Such chair should furthermore allow full nesting of its components to minimize its overall dimensions when closed and allow stacking of the chairs for storage.

Such results are achieved by a folding chair comprising two pairs of legs and a seat, articulated to one another, in which there is located between the front legs and rear legs an articulating device having one end rotationally integral with the rear leg and the opposite end rotationally integral with a fixed member projecting transversally from the rear face of the front leg, means also being provided for arresting the rotation of such articulating device in relation to the opposite positions of opening and closure.

More particularly, such articulating device consists of a plate of substantially "H" shape the opposite ends of which form housings to accommodate the upper ends of the rear legs, and of a member integral with the front legs, respectively. Furthermore, at such ends containing the fixed member there is provided a cavity extending lengthwise towards the inside of the plate and capable of accommodating such locking device, which preferably consists of a latch located inside the plate and capable of cooperating with the relevant recesses in such transverse member under the thrust action exerted in an axial direction by

flexible components, such recesses being arranged in a counterposed manner along an axis parallel to the longitudinal axis of the front legs in order to effect locking in relation to the sole positions of full opening and full closure.

According to this invention provision is also made, as an alternative, for such locking device to be comprised of a latch projecting transversally from the front leg and capable of being inserted by spring action into a corresponding housing of the articulating plate, or for such plate to be held against the front leg in the positions of full opening and full closure by means of devices of magnetic type. Further details may be obtained from the following description with reference to the attached drawings, which show:

In figure 1 : a front view of the chair according to the invention;

In figure 2 : a side view of the chair according to the invention;

In figures 3a, 3b : cross-sections according to axial planes at right angles to one another of the articulating device;

In figure 4a : a partial diagrammatic cross-section of the open chair;

In figure 4b : a cross-section similar to that in fig. 4a but with the chair closed, and

In figure 5 : the positioning sequence of the chair during the closing phase.

As shown in the figures, the chair according to the invention is essentially comprised of a supporting frame with a first member 1 consisting of two parallel plates 1a made integral with a transverse member 1b, also of plate type, and carrying at their upper end the opposite ends of a arched back 2.

To such member 1 is articulated by means of a device described hereinafter a second member 3 also comprised of two parallel plates 2a. Such first member 1 and second member 3 of the frame thus constitute the articulated legs of the chair - front legs 1a and rear legs 2a, respectively - to which is made rotationally integral, by means of pins or the like which are self-evident and not shown in the figures, seat 4.

As is apparent from figures 3a and 3b, the device for relative articulation of the legs consists of a plate 5 of substantially "H" shape the opposite ends of which form two housings 5a and 5b respectively extending lengthwise towards the inside of body 5, housing 5a being furthermore shaped with internal transverse side 5c located in an inclined position to allow relative rotation of rear leg 2a as will be described in greater detail hereinafter.

At housing 5b there is provided instead a cavity 6 to accommodate a spring 8 acting on a latch 9 capable of cooperating with corresponding recessed housings 7a provided, in counterposed positions, on the surface of a transverse member 7

projecting transversally from the rear surface of front leg 1a, to which it is attached, for example by means of screws, providing means for locking plate 5 in relation to front leg 1a.

On plate 5 there are also provided transverse through holes 5d capable of accommodating appropriate pins 6a providing a rotary link between plate 5 and rear leg 2a and plate 5 and transverse member 7. In the example of the figure the hole has one of its ends countersunk to accommodate the head of a flathead screw, not illustrated, the threaded end of which is engaged in nut 5e.

Figure 4a shows the relative setting of the various parts with the chair in an open condition: legs 1a are inclined according to a certain appropriate angle; plate 5 is set against legs 1a with latch 9 pushed by spring 8 against upper recessed housing 7a of cross-member 7 and with the rear legs correspondingly inclined to the rear. The counteraction of latch 9 maintains in a locked condition the relative positions of the various components to prevent accidental and undesired closure of the chair.

When it is desired to close the chair an upward jerk is applied to back 2 in order to raise front legs 1a from the ground. This jerking action neutralizes the thrust action of spring 8, causing the release of latch 9 from housing 7a and thus allowing the rotation of rear legs 2a, and therefore of pin 6a and plate 5, in the direction of arrow A. If back 2 is further raised to bring front legs 1a progressively into a vertical position, there is obtained the completion of rotation of plate 5 and of rear legs 2a until the latter are located parallel to the front legs and supported thereon. Once such final position is attained, latch 9 which during rotation of plate 5 slides along the convex surface of cross-member 7 encounters the second cavity 7a set against the first, into which it is forced by spring 8 thus once again ensuring locking of the chair in the closed position.

According to this invention, provision is also made for plate 5 to be made of magnetic material in order to obtain adherence to front leg 1a and ensure stability in the open and closed positions. In a further method of implementation provision may also be made for applying magnetic pads located in appropriate housings machined into the plate and the legs to obtain the same effect of adherence described above. Provision is also made for the locking device to consist of a latch projecting transversally from front leg 1a and capable of being inserted by spring action into a corresponding housing of plate 5.

Claims

1. A folding chair comprising two pairs of legs (1a,2a) and a seat (4) articulated to one another, characterized in that between front legs (1a) and rear legs (2a) there is located a locking device (5) having one end rotationally integral with rear leg (2a) and the opposite end rotationally integral with a fixed member (7) projecting transversally from the rear face of front leg (1a), there also being provided locking facilities (8,9,7a) to arrest the rotation of such articulating device (5) at the opposite positions of opening and closure.
2. A folding chair according to claim 1, characterized in that such articulating device is comprised of a plate (5) of substantially "H" shape the opposite ends of which form housings (5a,5b) to accommodate the upper ends of rear legs (2a) and of a member (7) integral with front legs (1a) respectively.
3. A folding chair according to claim 1, characterized in that at such end (5b) containing fixed member (7) there is provided a cavity extending lengthwise to the inside of body (5) and capable of accommodating such locking device (8,9).
4. A folding chair according to claim 1, characterized in that such locking device preferably consists of a latch (9) housed within plate (5) and capable of cooperating with corresponding recesses (7a) in such cross-member (7) under the thrust action exerted in an axial direction by flexible components (8).
5. A folding chair according to claims 1 and 4, characterized in that such recesses are arranged in a counterposed manner along an axis parallel to the longitudinal axis of front legs (1a) in order to bring about locking only at the positions of full opening and full closure.
6. A folding chair according to claim 1, characterized in that such locking device is preferably comprised of a latch projecting transversally from front leg (1a) and capable of being inserted by spring action into a corresponding housing of plate (5).
7. A folding chair according to claims 1 and 2, characterized in that such plate (5) is held against front leg (1a) in the positions of full opening and full closure by means of devices of magnetic type.

Fig. 1

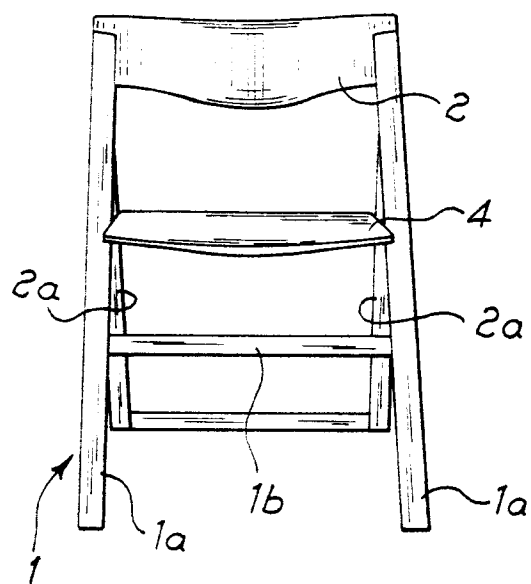


Fig. 2

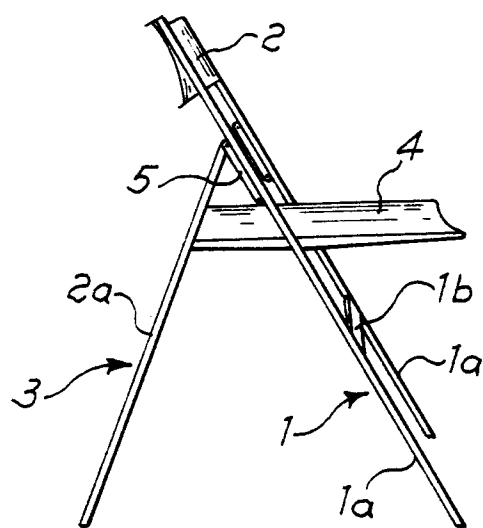


Fig. 5

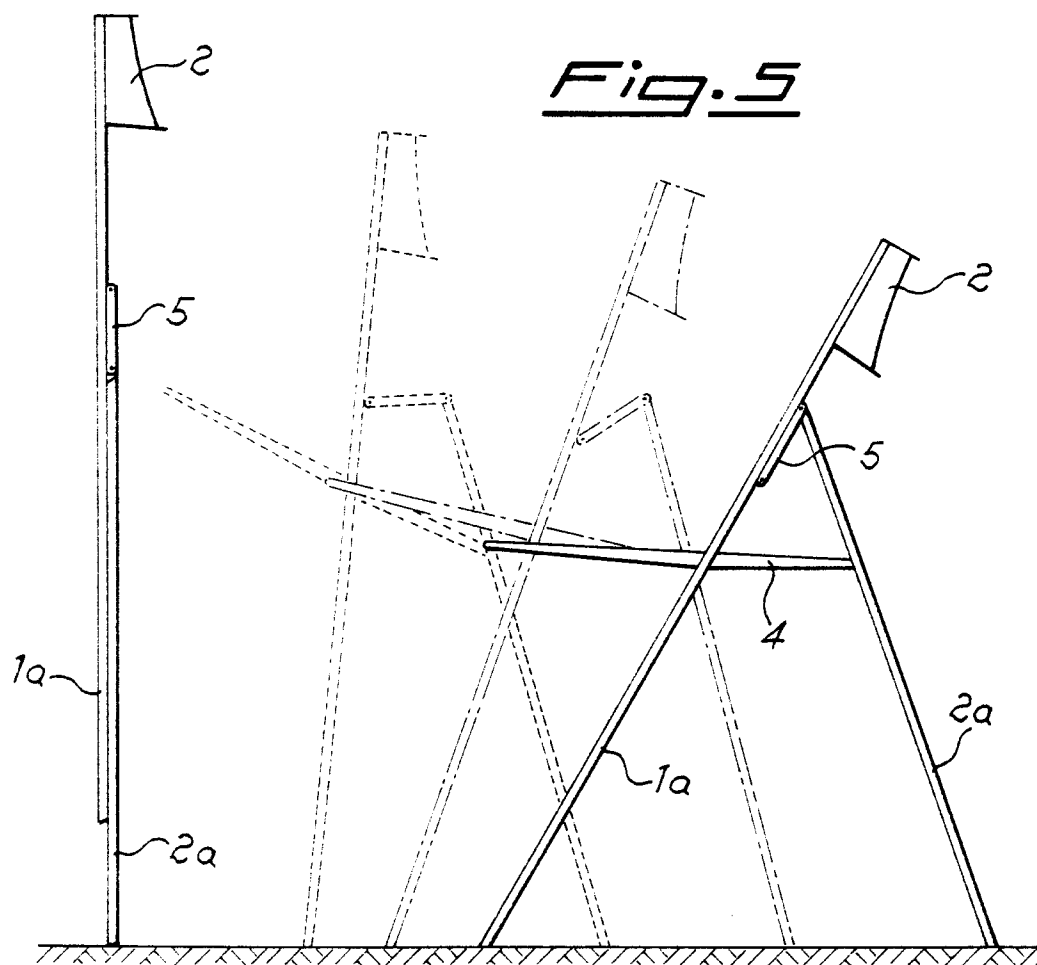


Fig. 3a

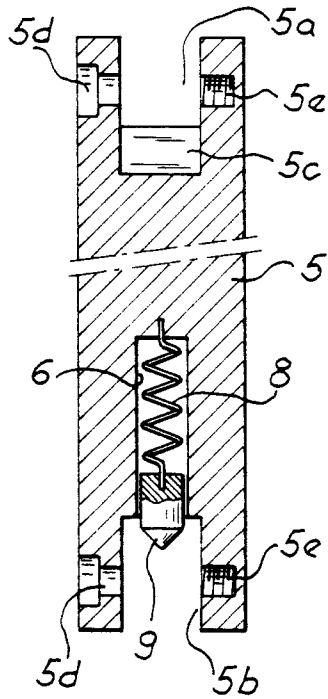


Fig. 3b

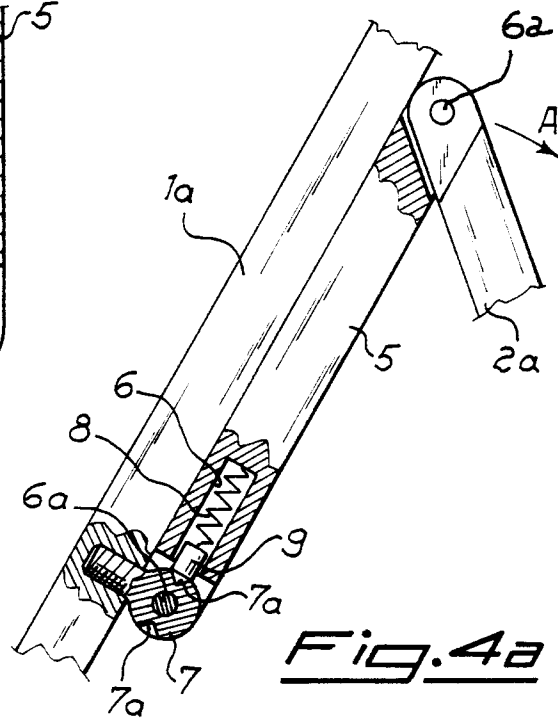
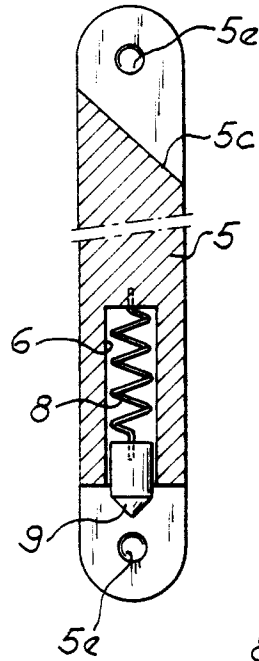


Fig. 4a

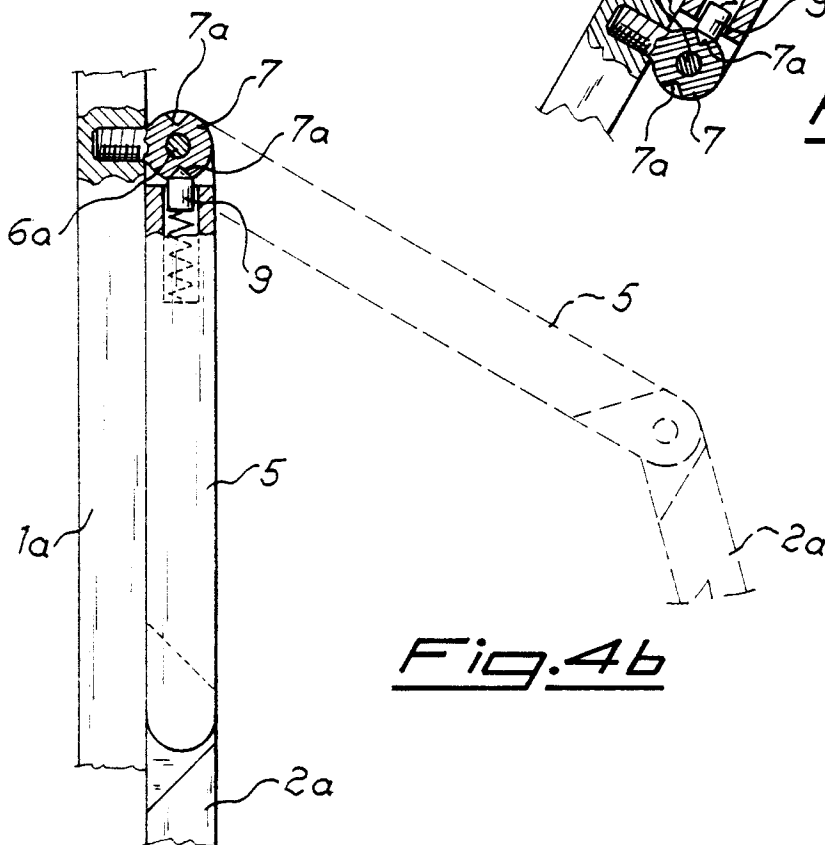


Fig. 4b



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 20 2421

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	DE-U-9 000 090 (KOLBERG) * page 3, line 8 - page 4, line 12; claims 1,2; figures 1-3 * ---	1,2,4,5,6	A47C4/20
Y	EP-A-0 220 579 (OTLAV S.P.A.) * page 4, line 3 - line 30; claims 1,2; figures 3-5 * ---	1,2,4,5,6	
A	FR-A-2 334 808 (ZWAHLEN) * the whole document * -----	1,4,5,6	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A47C E06C E05D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10 DECEMBER 1992	Examiner MYSLIWETZ W.P.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			