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(54) **Chair with extendible foot rest**

(57) The invention refers to a chair for sitting and/or reclining, with an extendible foot rest, a rack which can slide on a frame of the chair, the foot rest being coupled to the front end of the rack, as well as an actuating device for extending and retracting the foot rest. The foot rest is mounted so as to be pivotable about a pivot axis on the front end of the rack, and an actuating bar is provided which is retained so as to be displaceable on the frame between two end positions relative to the rack and which

with its front end is in contact with the foot rest, wherein a further displacement of the rack relative to the actuating bar located in its one end position causes the foot rest to swing out about the pivot pin and a further displacement of the rack relative to the actuating bar located in its other end position causes the foot rest to swing in about the pivot axis.

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Description

[0001] The invention relates to a chair for sitting and/or reclining with an extendible foot rest, a rack which can slide on a frame of the chair, the foot rest being coupled to the front end of the rack, as well as an actuating device for extending and retracting the foot rest.

[0002] A chair with an extendible foot rest is known from DE-U-87 03 625, in which the foot rest is coupled to a slidable rack by way of a scissor mechanism. The actuating device acts on an articulation point between two connecting rods of the scissor mechanism.

[0003] Due to the large range of projection of the scissor mechanism, this known chair with an extendible foot rest makes it possible to support the heels of a person lying on the chair.

[0004] However, in the retracted state this known solution requires a relatively large amount of space.

[0005] The object of the invention, therefore, is to provide a chair for sitting and/or reclining with an extendible foot rest which is distinguished by a very compact design.

[0006] This object is achieved according to the invention by the features of Claim 1.

[0007] The chair for sitting and/or reclining basically has an extendible foot rest, a rack which can slide on a frame of the chair, the foot rest being coupled to the front end of the rack, as well as an actuating device for extending and retracting the foot rest. Furthermore, it is provided that the foot rest is mounted so as to be pivotable about a pivot axis on the front end of the rack. Moreover, an actuating bar is provided which is retained so as to be displaceable on the frame between two end positions relative to the rack and which with its front end is in contact with the foot rest, wherein a further displacement of the rack relative to the actuating bar located in its one end position causes the foot rest to swing out about the pivot pin and a further displacement of the rack relative to the actuating bar located in its other end position causes the foot rest to swing in about the pivot axis.

[0008] Further embodiments of the invention are the subject matter of the subordinate claims.

[0009] According to a preferred embodiment, the foot rest is connected by way of a rigid connecting element to the front end of the actuating bar, wherein the connecting element is retained with one of its ends so as to articulate on the foot rest and with its other end so as to articulate on the actuating bar.

[0010] According to a further embodiment, the foot rest is provided with a fitting which has a first articulation point for the pivot axis and a second articulation point for coupling to the actuating bar.

[0011] The solution according to the invention is distinguished by the fact that very little space is required in the retracted state. Also the manufacture of the system is very cost-effective. Nevertheless, the foot rest can be extended very far from the chair.

[0012] Further advantages and embodiments of the invention are explained in greater detail below with refer-

ence to the description of an embodiment and to the drawings.

[0013] In the drawings:

5 Figure 1 shows a schematic side view of the chair for sitting and/or reclining according to the invention with the foot rest retracted,

10 Figure 2 shows a three-dimensional representation of the frame with slidable rack, actuating bar and actuating device,

15 Figures 3 to 6 shows various positions of the foot rest as it is being extended,

Figure 7 shows a schematic representation of the foot rest in the extended state, and

20 Figures 8 to 9 show various positions of the foot rest as it is being retracted.

[0014] The chair for sitting and/or reclining 1 which is illustrated schematically in Figures 1 and 2 basically comprises a seat 2, a back rest 3 as well as a frame 4. Furthermore, a retractable foot rest 5, a rack 6 which can slide on the frame 4 and also an actuating device for extending and retracting the foot rest are provided. The rack 6 is mounted in guides 8, 9 on both sides of the frame so that it can slide relative to the frame. In the illustrated embodiment the rack comprises two lateral longitudinal sections 6a which are connected to one another by a transverse section 6b.

[0015] The actuating device 7 has for example a threaded spindle which can be driven by way of a geared motor, wherein the drive arrangement is retained by one end on the frame and is coupled to a drive element 7a on the rack 6, in particular on the transverse section 6b, the drive element being displaceable by the threaded spindle.

[0016] Furthermore, at least one actuating bar 10 is provided which is retained so that it can slide on the frame 1 between two end positions relative to the rack. In the illustrated embodiment retaining means 11 and 12 are provided which make displacement of the actuating bar 10 possible. The actuating bar 10 is provided at its two ends with transverse pins 13, 14 which come into contact with the retaining means 11, 12 respectively in the end positions of the actuating bar.

[0017] The foot rest is retained at the front end of the rack 6 so as to be pivotable about a pivot axis 15. Furthermore, the front end of the actuating bar 10 is in contact with the foot rest 5.

[0018] In the illustrated embodiment the foot rest is provided with a fitting 16 which has a first articulation point for the pivot axis 15 and a second articulation point for coupling to the actuating bar. The coupling between the foot rest and the actuating bar takes place by way of a rigid connecting element 17 which is retained with one

of its ends so as to articulate on the foot rest and with its other end so as to articulate on the actuating bar. The two articulation points are denoted by the reference numerals 18 and 19.

[0019] Figures 3 to 7 show the sequence of movements of the foot rest from the retracted position to the extended position. In this case the arrow 20 shows the direction of movement of the rack 6.

[0020] The longitudinal sections 6a of the rack 6 and the actuating bar 10 are oriented parallel to one another, so that during the entire sequence of movements there is a parallel relative movement between the rack and the actuating bar.

[0021] From the retracted position according to Figure 1, when the rack 6 is displaced the actuating bar 10 is entrained by way of the coupling to the foot rest 5 until the transverse pin 13 comes into contact with the retaining means 11 and thereby blocks the further displacement of the actuating bar 10 (see Figure 6). A further movement of the rack 10 in the direction of the arrow 20 then causes the foot rest 5 to swing out about the pivot axis 15, as shown in Figures 6 and 7.

[0022] Figures 8 and 9 show two intermediate positions during the retraction of the foot rest. If the rack 6 in the fully extended position of the foot rest according to Figure 7 is moved back in the direction of the arrow 21 by way of the actuating device 7, then the foot rest will first of all swing downwards due to gravity, as shown in Figure 8. As the retraction proceeds a simultaneous movement of the actuating bar 10 and of the rack 6 takes place until the transverse pin 14 of the actuating bar comes into contact with the retaining means 12 and thereby blocks further movement of the actuating bar 10. A further displacement of the rack 6 in the direction of the arrow 21 then causes the foot rest to swing in about the pivot axis 15 until the position according to Figure 1 is reached.

[0023] In order to obtain a defined end position of the foot rest in the retracted state and to prevent any swinging of the foot rest, a pin 22 which in the end position comes into contact with the rack 6 or with the retaining means 8 is provided on the fitting 16 (see Figure 1).

[0024] Whenever only one actuating bar is shown in the drawings, within the scope of the invention actuating bars are advantageously provided on both sides of the frame in order to prevent tilting of the movable parts.

Claims

1. Chair (1) for sitting and/or reclining, with

- a. an extendible foot rest (5),
- b. a rack (6) which can slide on a frame of the chair, the foot rest being coupled to the front end of the rack,
- c. as well as an actuating device for extending and retracting the foot rest,

characterised in that

d. the foot rest is mounted so as to be pivotable about a pivot axis (15) on the front end of the rack, and

e. an actuating bar (10) is provided which is retained so as to be displaceable on the frame between two end positions relative to the rack and which with its front end is in contact with the foot rest (5), wherein a further displacement of the rack (6) relative to the actuating bar located in its one end position causes the foot rest to swing out about the pivot pin and a further displacement of the rack relative to the actuating bar located in its other end position causes the foot rest to swing in about the pivot axis.

2. Chair for sitting and/or reclining as claimed in Claim 1, **characterised in that** the foot rest (5) is connected by way of a rigid connecting element (17) to the front end of the actuating bar (10), wherein the connecting element is retained with one of its ends so as to articulate on the foot rest and with its other end so as to articulate on the actuating bar (10).
3. Chair for sitting and/or reclining as claimed in one or more of the preceding claims, **characterised in that** both the rack (6) and the actuating bar (10) are displaceable in a straight line.
4. Chair for sitting and/or reclining as claimed in one or more of the preceding claims, **characterised in that** the actuating device (7) is coupled to the rack (6).
5. Chair for sitting and/or reclining as claimed in one or more of the preceding claims, **characterised in that** the rack (6) has on both sides longitudinal sections (6a) which extend in the direction of displacement and to the front ends of which the foot rest (5) is coupled.
6. Chair for sitting and/or reclining as claimed in one or more of the preceding claims, **characterised in that** the rack (6) has on both sides longitudinal sections (6a) which extend in the direction of displacement and to the front ends of which the foot rest (5) is coupled, and that the actuating bar (10) extends parallel to the longitudinal sections.
7. Chair for sitting and/or reclining as claimed in one or more of the preceding claims, **characterised in that** the rack (6) and the actuating bar (10) are mounted on the frame (4) in such a way that during the entire sequence of movements as the foot rest (5) is extended and retracted a parallel relative movement is produced between the frame and the actuating bar.
8. Chair for sitting and/or reclining as claimed in one or more of the preceding claims, **characterised in that**

the actuating bar (10) is mounted in at least one retaining means (11, 12), the retaining means also serving simultaneously as a stop for the two end positions.

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9. Chair for sitting and/or reclining as claimed in one or more of the preceding claims, **characterised in that** mounted on the foot rest (5) is a fitting (16) which has an articulation point for the pivot axis (15) and an articulation point for coupling to the actuating bar (10).

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Fig.1

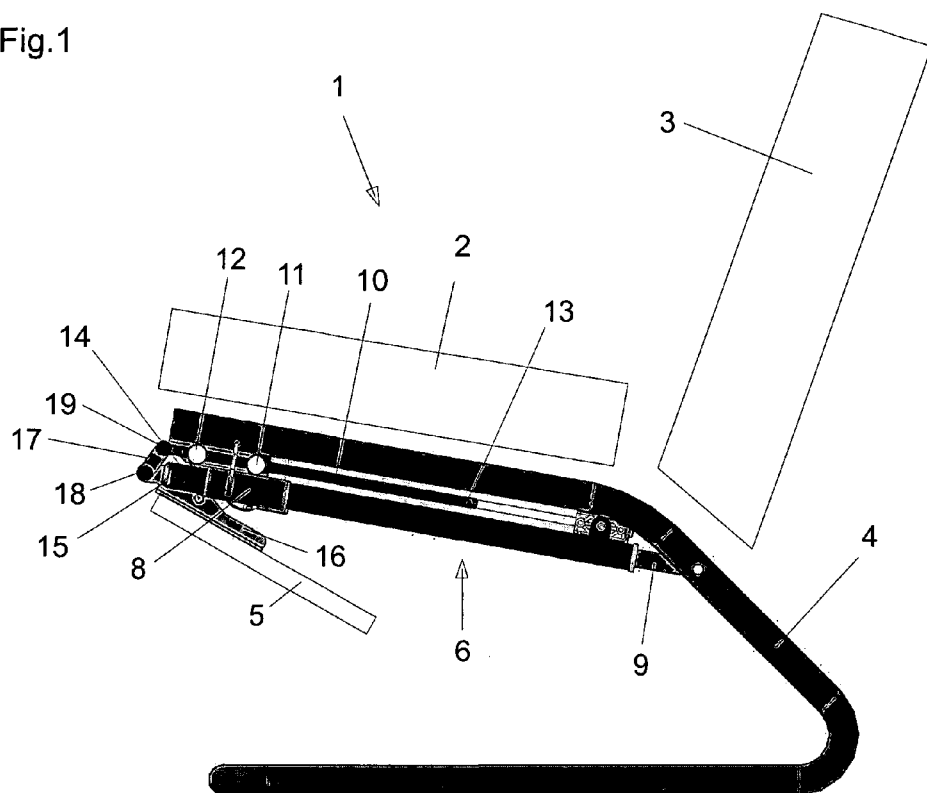


Fig.2

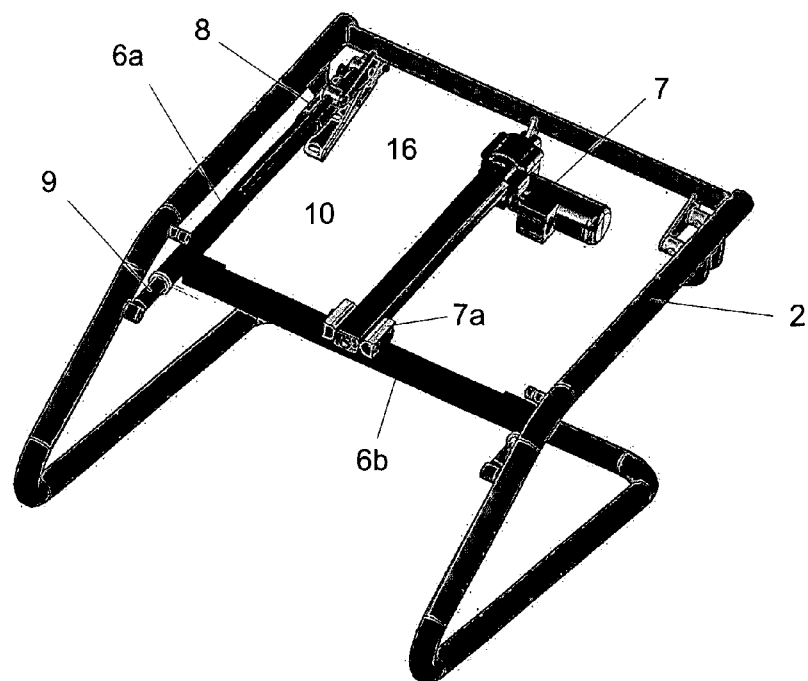


Fig. 3

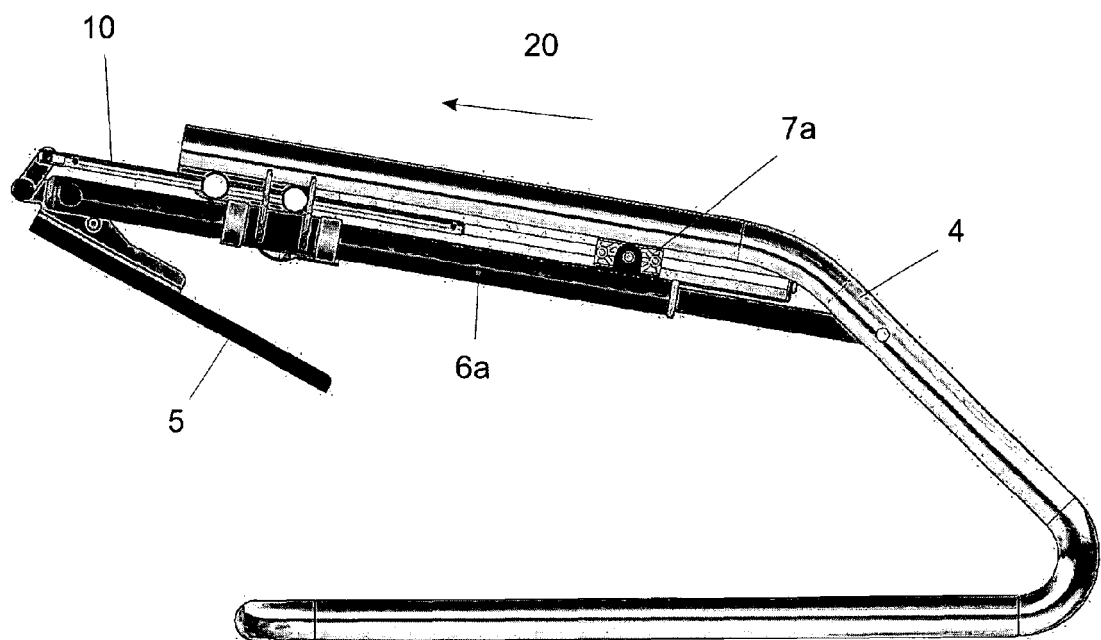


Fig.4

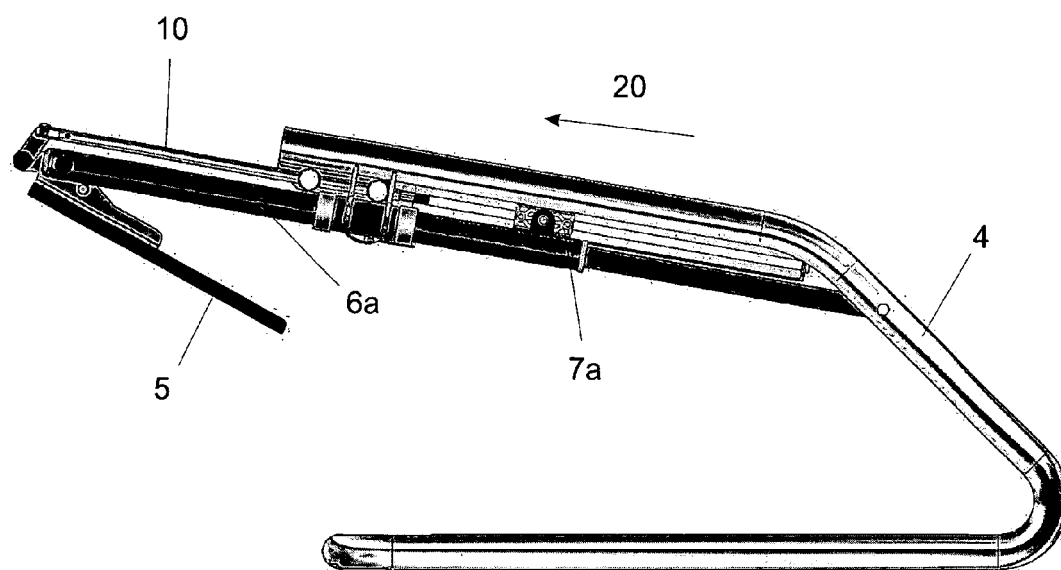


Fig.5

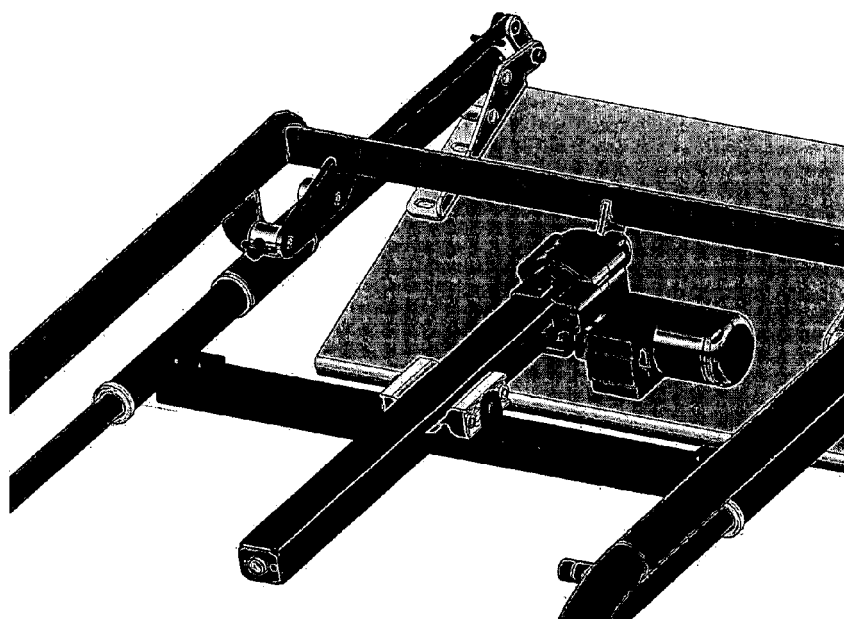


Fig.6

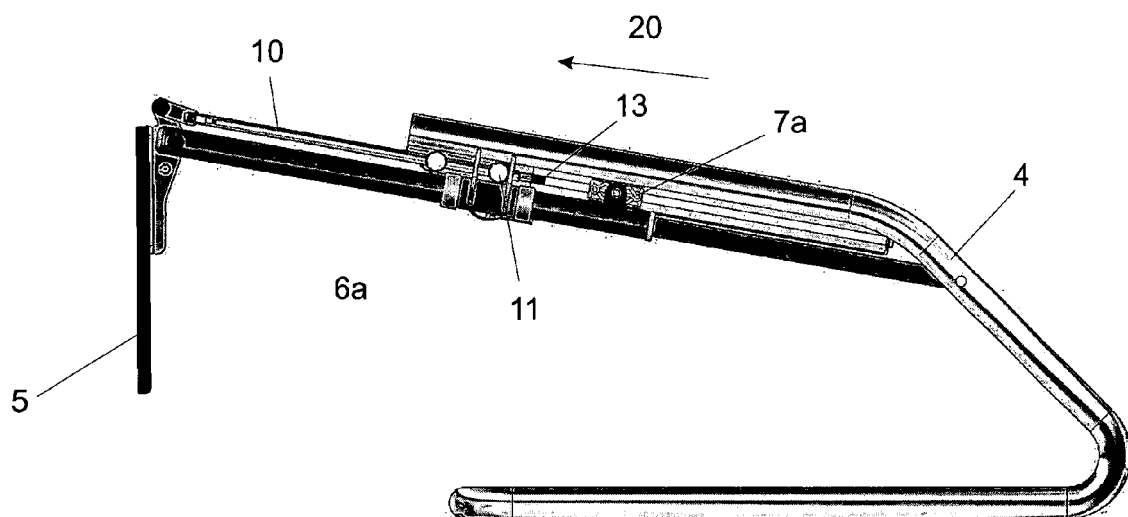


Fig.7

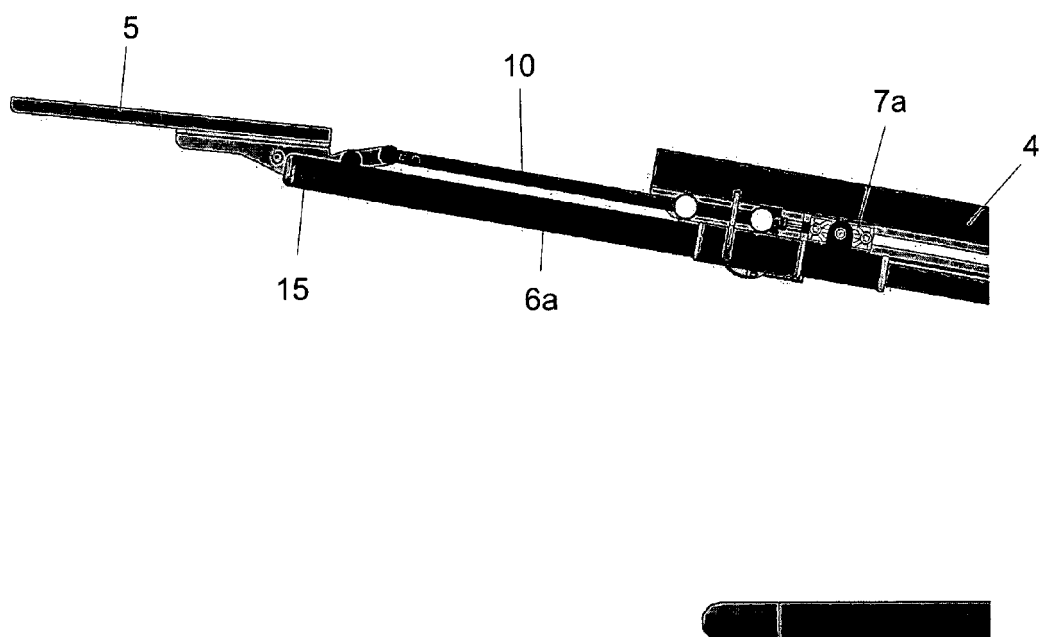


Fig.8

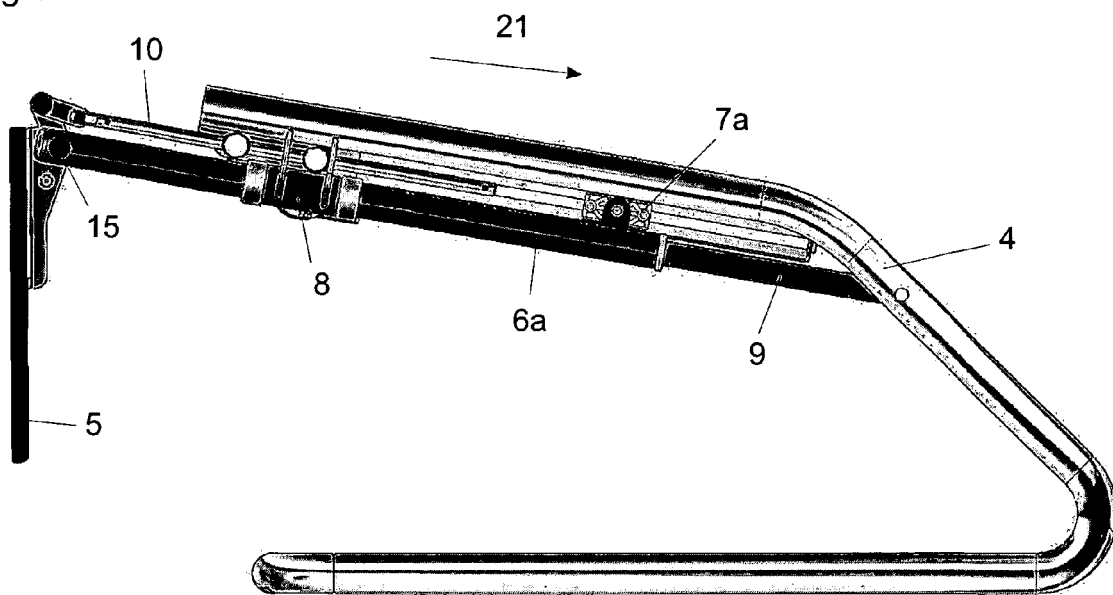
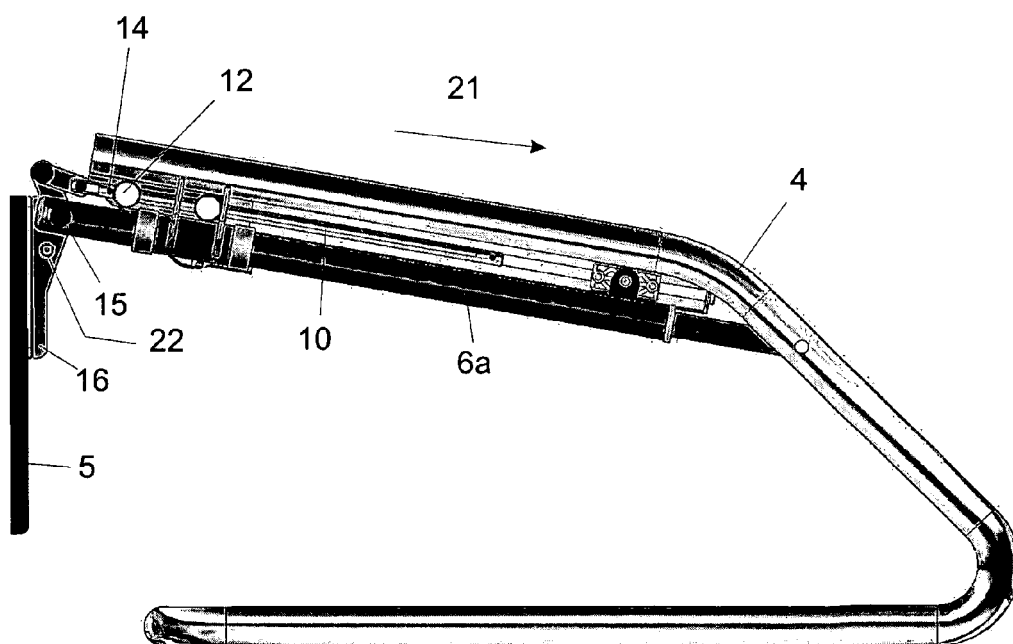


Fig.9





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EUROPEAN SEARCH REPORT

Application Number
EP 06 00 7062

DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
A	US 3 794 381 A (CALDEMEYER) 26 February 1974 (1974-02-26) * the whole document *	1	INV. A47C7/50	
A	US 5 507 562 A (WIELAND ET AL) 16 April 1996 (1996-04-16) * column 1, line 55 - column 4, line 6; figures 2-8 *	1		
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 06, 31 March 1999 (1999-03-31) & JP 01 043210 A (KOITO IND LTD), 15 February 1989 (1989-02-15) * abstract *	1		
A	FR 2 806 277 A (LAMBIN) 21 September 2001 (2001-09-21) * page 1 - page 2; figures 1-3 *	1		
A	US 3 869 169 A (JOHNSON ET AL) 4 March 1975 (1975-03-04) * figures 2,4,6-10 *	1		TECHNICAL FIELDS SEARCHED (IPC)
A,D	DE 87 03 625 U1 (KEMMANN & KOCH) 23 April 1987 (1987-04-23) * figure 3 *	1		A47C B60N
A	EP 1 133 940 A (CIAR S.P.A) 19 September 2001 (2001-09-19) * figures 1-4 *	1		
The present search report has been drawn up for all claims				
Place of search The Hague		Date of completion of the search 24 July 2006	Examiner Kis, 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				

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

EP 06 00 7062

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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24-07-2006

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3794381	A	26-02-1974	NONE	
US 5507562	A	16-04-1996	NONE	
JP 01043210	A	15-02-1989	NONE	
FR 2806277	A	21-09-2001	NONE	
US 3869169	A	04-03-1975	NONE	
DE 8703625	U1	23-04-1987	NONE	
EP 1133940	A	19-09-2001	DE 60110488 D1	09-06-2005
			DE 60110488 T2	19-01-2006
			IT MI20000571 A1	17-09-2001
			US 2001022461 A1	20-09-2001

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 8703625 U [0002]