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(54) **Ratchet device**

(57) A ratchet device (D) comprising an element (1) with two wings (2,3) pivoted to each other at a central portion (4) of said element (1), and a coupling mechanism (5) for the movable coupling of said wings (2,3) at said central portion (4), and the movement of said wings (2,3) between two limit positions (A,B); said mechanism (5) comprises plate means (8,8',14,14',22,22') adapted to clamp to each other said wings (2,3), and provided with a single semicircular sector (S) and with toothed lock means (8) in two-way acting on said semicircular sector (S).

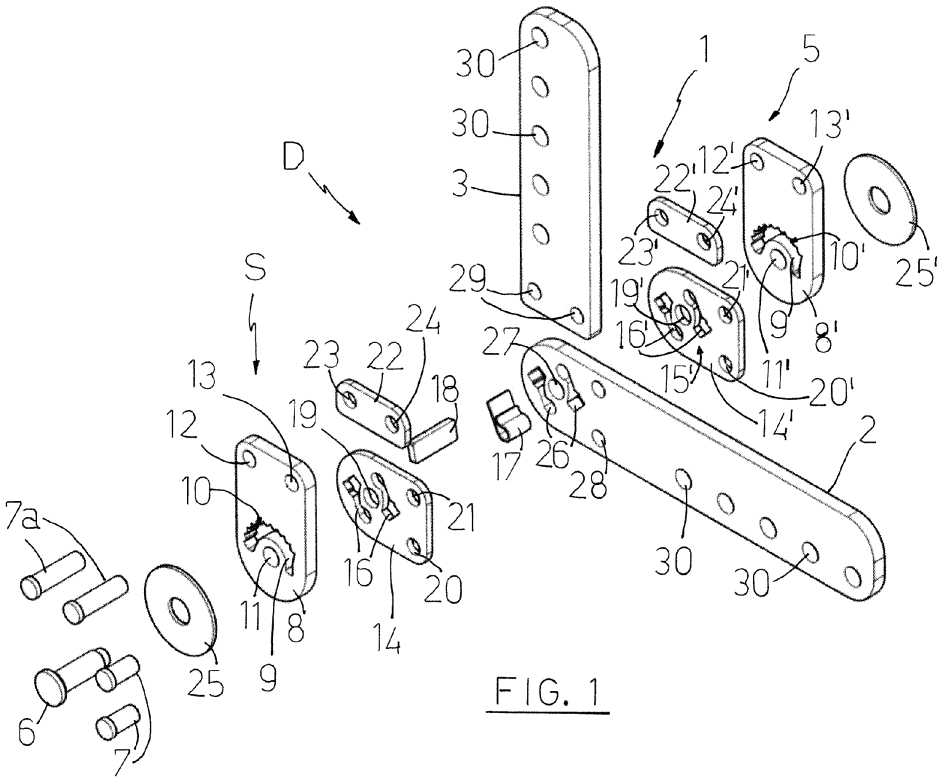

FIG. 1

EP 2 727 496 A1

Description

[0001] The present invention relates to a ratchet device.

[0002] In particular, invention in object is advantageously used in upholstered furniture field in order to allow the controlled movement of movable parts, such as headrests, footrests, armrests or equivalent elements furniture, sofas, armchairs or the like, to which the following description explicitly referes to without thereby losing in generality.

[0003] In the production of sofas or armchairs, in order to allow and facilitate the controlled movement of the moving parts as a headrest or footrest is known to use devices ratchet, in general defined by an element with two wings hinged together in correspondence of a portion central element and mobile in rotation between them with a movement of opening / closing by means of a toothed ratchet mechanism.

[0004] One of the mentioned wings of the device is fixed on a portion or edge of the headrest , while the other wing is fixed to a portion or edge of a fixed part, the backrest of the sofa , thereby allowing to realize a relative movement of rotation and opening in the upright position of the headrest relative to the backrest in such a manner as to raise and support in an optimal way the head of the user sitting on the sofa. Currently , the structure of the ratchet devices of the known type described above is such as to allow a rotation of the opening of a wing with respect to the other wing of a limited angle with respect to the initial closed position, specifically not more than 90 degrees, or between a closed position in which the two wings are arranged orthogonal to each other, and a position of complete opening in which the two wings are arranged aligned with each other and from the side opposite the hinge.

[0005] This does not allow to achieve an opening of the headrest, adequate to support the user's head, relative to the backrest of the sofa even when the backrest is reclined and is movable with respect to the traditional substantially vertical position.

[0006] The scope of the present invention is therefore to solve the drawback of the prior art described above.

[0007] In particular, the scope of the present invention is to provide an improved device able to be applied to a sofa or armchair and allow to realize a lifting handling of the headrest relative to the backrest of the sofa or armchair with an angle even greater than 90 degrees. The structural and functional characteristics of the invention in-suit and its advantages compared to the known art will be clearer and more evident by the claims below, and in particular from an examination of the following description, referring to the attached drawings, which show the schematic of a preferred but non-limiting embodiment of a ratchet device, wherein:

- Figure 1 is an exploded view of the components of the ratchet device in object;
- Figure 2 is a front view of the device of Figure 1 in a first operating position;
- Figure 3 is a perspective view of the device in the operative position illustrated in Figure 2;
- Figure 4 is a perspective view of the device of Figure 1 in a second operating position, and
- Figure 5 represents the device of figure 1 in a third operating position.

[0008] With reference to the attached figures, D globally indicates a ratchet device adapted to be used preferably but not limited in the upholstered furniture industry for the movement of movable parts, such as the headrest, or equivalent elements furniture, sofas, armchairs or similar (known and not shown).

[0009] As illustrated in Figures 1 to 5, the device D includes an element 1 with two wings 2 and 3 hinged together in correspondence of a central portion 4 of the element 1 via a coupling ratachet mechanism 5.

[0010] The wings 2 and 3 are therefore movable in rotation each other around a fixing pin 6 with a movement of opening / closing generated by the mechanism 5 from which the pin 6 is part of.

[0011] The mechanism 5 also comprises the following elements, arranged in pairs opposite side with respect to the two wings 2 and 3 and fixed between them perfectly fitting into a single assembly by means of locking rivets 7 and 7a:

- a first and a second plate 8 and 8 ' , each of which is provided with a cave semicircular sector 9,9' provided with a single toothed edge 10,10', a hole 11,11' suitable to accommodate the pin 6 , and two additional holes 12,12' and 13,13' for respective two rivets 7a;
- a third and a fourth plate 14 and 14', each of which is arranged in contact with a relative plate 8,8', it is provided with a pair 15,15' of slits quarries 16,16' with various shape and oriented each other in the opposite way, and designed to accommodate respective springs 17 acting on related blocks or pawls 18 (only one spring 17 and a pawl 18 shown for simplicity in Figure 1); each plate 14,14' also has a hole 19,19' adapted to receive the pin 6, and two additional holes 20,20' and 21,21' for rivets 7;
- a fifth and a sixth locking plate 22,22', each provided with two holes 23,23' and 24,24' for the respective rivets 7a.

[0012] In this way, the pawls 18 are adapted to engage in the teeth of a single sector S of the mechanism 5 defined by the alignment of the sectors 9 and 9' as a result of the coupling of the semi-circular plates 8 and 8' between the wings 2 and 3, so forming a two-way moving and locking ratchet system.

[0013] A pair of washers 25 and 25', finally, completes the mechanism 5.

[0014] As illustrated in Figure 1 and in Figures 3,4 and

5, the wing 2 has a longitudinal dimension greater than the wing 3, and it is provided with two quarries slits 26 identical to the aforementioned slits 16,16' described above, of a passage hole 27 for the pin 6, and of a pair of holes 28 for the passage of respective rivets 7 and which blocks the cited wing 2 between the plates 14,14'; the wing 3 has a pair of holes 29 for the passage of respective rivets 7a and which blocks the cited wing 3 between the plates 8,22, and 8',22'. Both the wing 2 and wing 3 also have a series of holes 30 for the attachment in known manner to fixed parts and / or furniture of sofas or armchairs.

[0015] The mounting of the wings 2 and 3 to the middle of the mechanism 5, with the pawls 18 able to engage in the unique semicircular sector with toothed edge of the same mechanism 5, therefore forms a two-way ratchet device able to allow the two wings 2 and 3 to be rotated between them with respect to pin 6, being moved between a closing position A (figures 2 and 3), in correspondence of which the wings 2 and 3 are arranged orthogonal to each other, and a position of full opening B (figure 5), in correspondence of which the wing 3 is able to achieve in respect of the wing 2 an limit angles β so as to define an opening movement with respect to the closed position of approximately 150 degrees, and then beyond the limit position of opening (figure 5) with two wings aligned as the traditional ratchet mechanisms.

Claims

1. Ratchet device (D) comprising an element (1) with two wings (2,3) pivoted to each other at a central portion (4) of said element (1), and a coupling mechanism (5) for the movable coupling of said wings (2,3) at said central portion (4), and the movement of said wings (2,3) between two limit positions (A, B), **characterized by** the fact that the said mechanism (5) comprises plate means (8,8',14,14',22,22') adapted to clamp to each other said wings (2,3), and provided with a single semicircular sector (S) and with toothed lock means (8) in two-way acting on said semicircular sector (S).

2. Device according to claim 1, **characterized in that** a first wing (2) of said two wings (2,3) has a longitudinal dimension greater than the second wing (3), and is provided with slits (26), a hole (27) for passage of a pin (6), and holes (28) for the passage of the respective fixing means (7) adapted to lock said first wing (2) between said plate means (8,8',14,14'), said second wing (3) having holes (29) for the passage of the second fixing means (7a) acts to lock said second wing (3) between said plate means (8,8',22,22').

3. Device according to claim 2, **characterized in that** said plate means (8,8',14,14',22,22') comprise a first plate and a second plate (8,8'), each of which is provided of a cave semicircular sector (9,9') provided with a single toothe edge (10,10'), with a passing hole (11,11') adapted to receive a pin (6), and holes (12, 12',13,13') for said second fixing means (7a); a third and a fourth plate (14,14'), each of which is arranged in contact with a relative said first, second plate (8,8')provided with a pair (15,15') of cave slots (16,16')suitable to accommodate respective springs (17) acting on said lock means (18), each said third and fourth plate (14,14') having a passing hole (19,19') adapted to receive said pin (6), and holes (20,20', 21,21') for said first fixing means (7); and a fifth and a sixth plate (22,22'), each provided with holes (23,23',24,24') for said second fixing means (7a).

4. Device according to claim 2 and 3, **characterized in that** said slits (26) of said first wing (2) and said slits (16,16') of said third and fourth plate (14,14') present the same shape and are arranged on the opposite side with respect to the respective holes (27,11,11') for accommodating said pin (6).

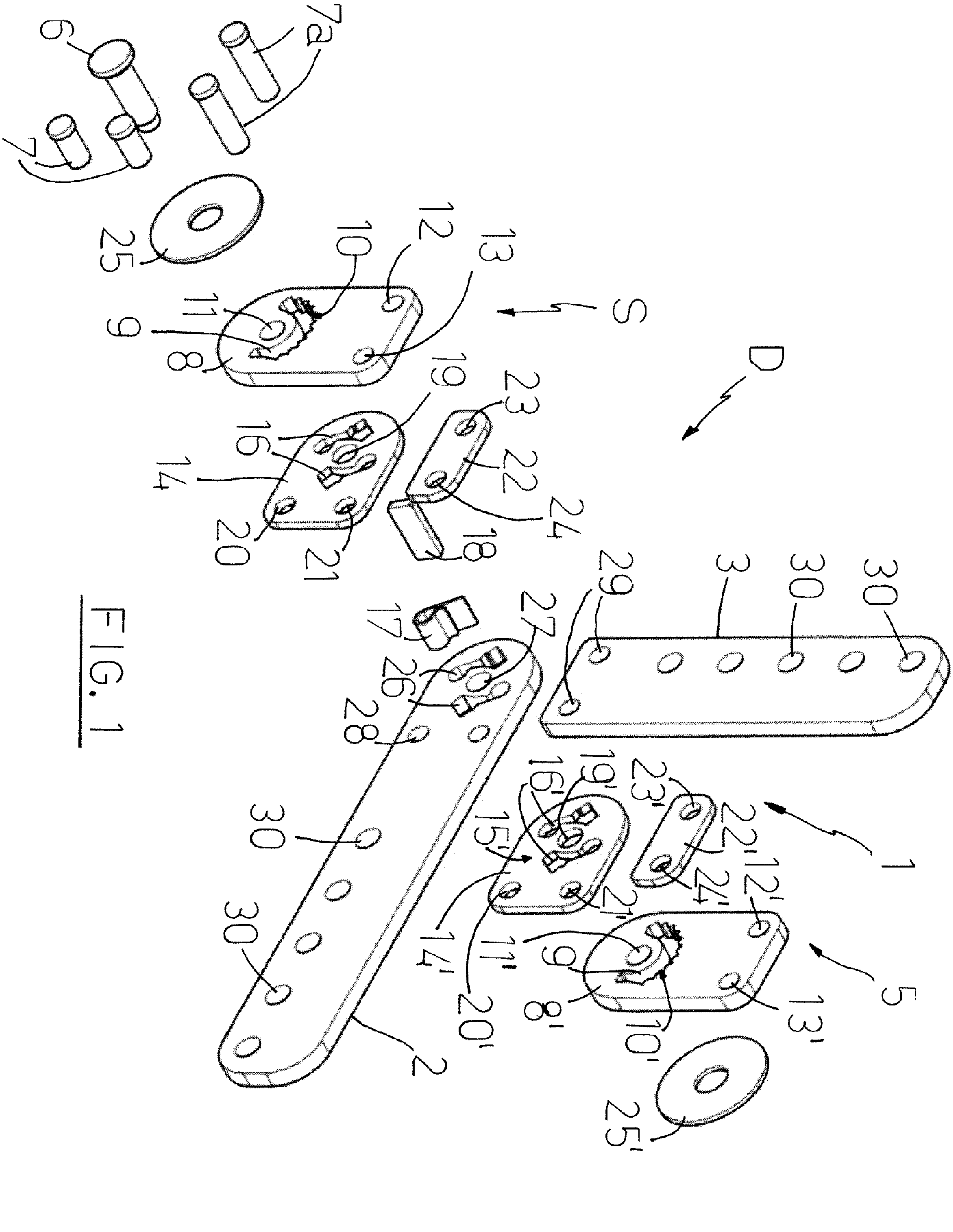
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FIG. 1

FIG. 2

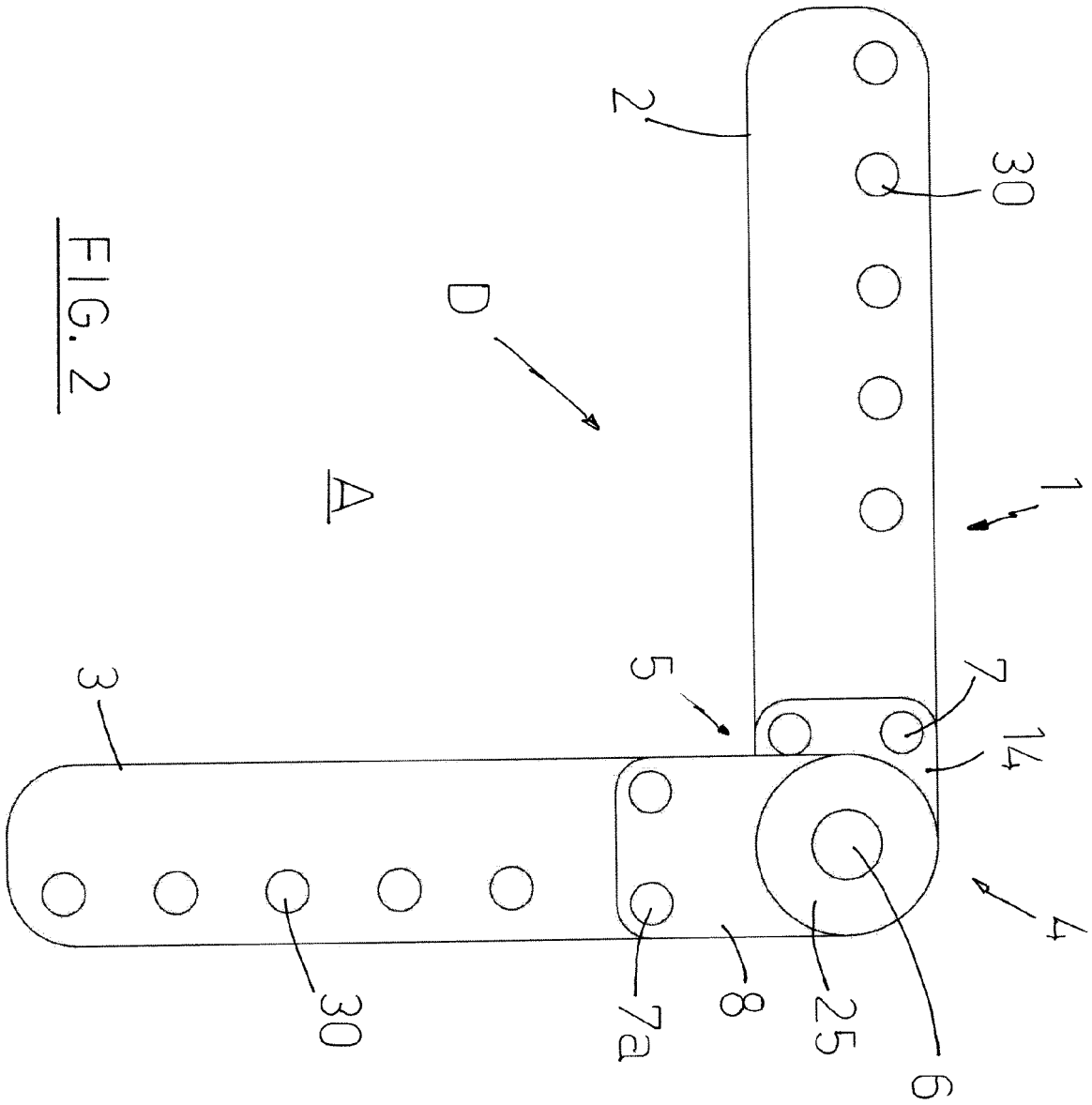
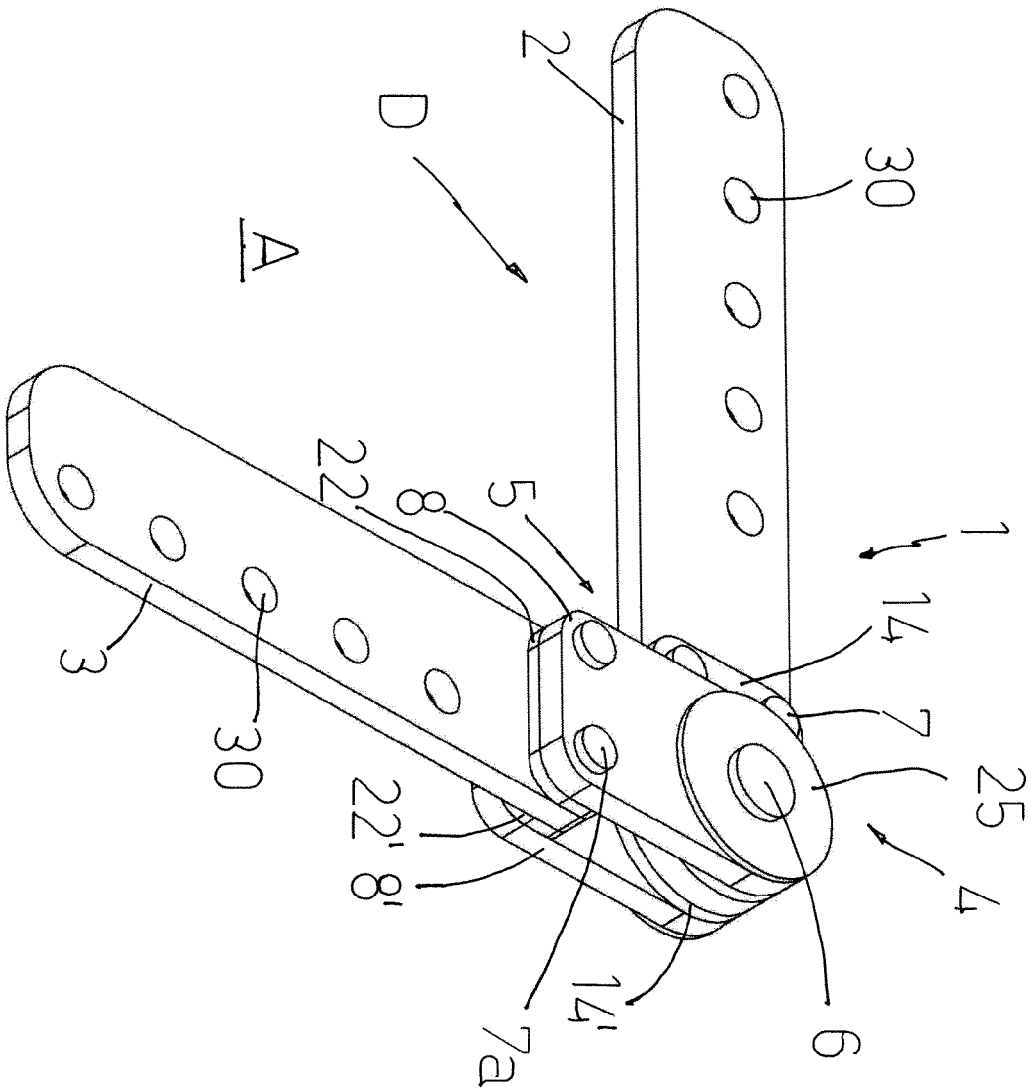


FIG. 3



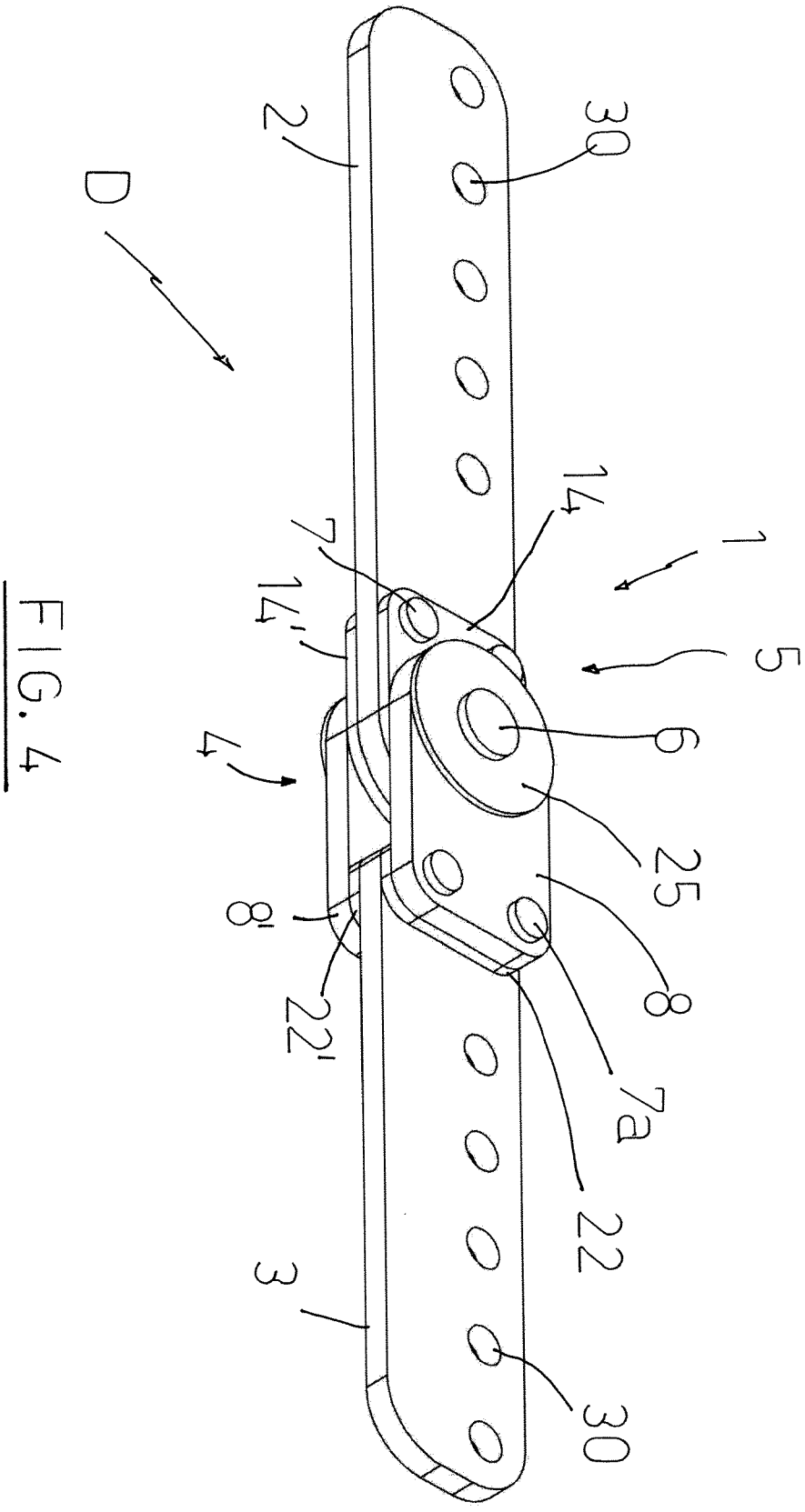


FIG. 4

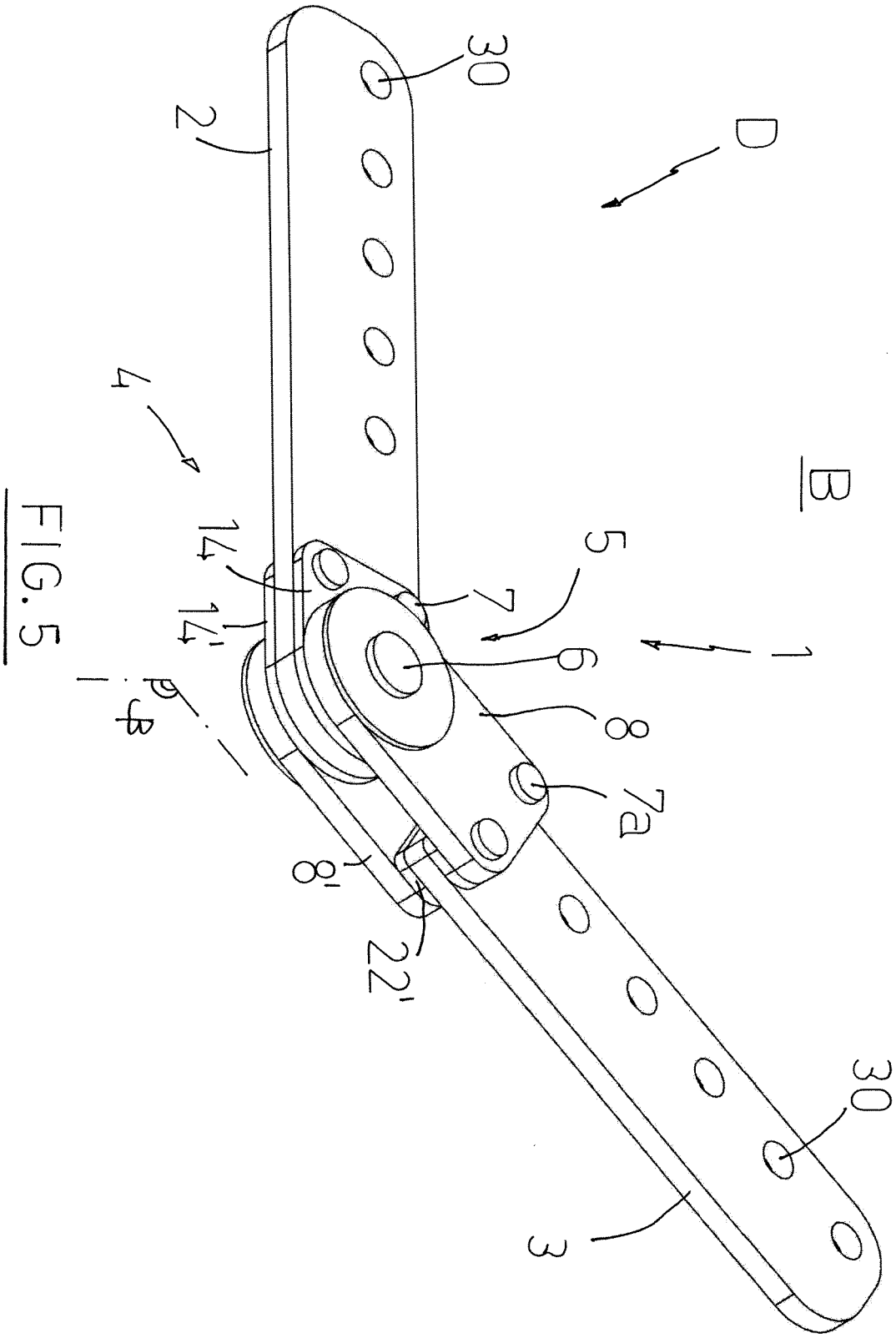


FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 13 19 0438

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 2010/293748 A1 (YAMASHITA TADANOBU [JP]) 25 November 2010 (2010-11-25) * paragraph [0041] - paragraph [0084]; figures 1-16 *	1-4	INV. A47C7/38 A47C7/40 A47C7/50 A47C1/026
X	US 4 875 735 A (MOYER GEORGE A [US] ET AL) 24 October 1989 (1989-10-24) * column 2, line 38 - column 4, line 20; figures 1-3 *	1,2,4	
X	US 2009/288270 A1 (YAMASHITA TADANOBU [JP]) 26 November 2009 (2009-11-26) * paragraph [0023] - paragraph [0070]; figures 1-7 *	1	
X	EP 2 198 749 A1 (LUSCH GMBH & CO KG FERD [DE]) 23 June 2010 (2010-06-23) * paragraph [0019] - paragraph [0028]; figures 1-3 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

A47C
B60N

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	29 January 2014	Kus, Slawomir

CATEGORY OF CITED DOCUMENTS

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