



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.05.2017 Bulletin 2017/20

(51) Int Cl.:
A47C 1/035 (2006.01) A47C 7/50 (2006.01)

(21) Application number: **16196494.5**

(22) Date of filing: **30.10.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
 Designated Extension States:
BA ME
 Designated Validation States:
MA MD

(71) Applicant: **Ravaioli, Elio Maurizio**
47121 Forli (FC) (IT)

(72) Inventor: **Ravaioli, Elio Maurizio**
47121 Forli (FC) (IT)

(30) Priority: **30.10.2015 EP 15192435**

(54) **MOVEMENT MECHANISM FOR MOVING PARTS OF A RECLINING SOFA OR CHAIR**

(57) A movement Mechanism (M) for moving the mobile parts (SE) of a reclining upholstered furniture (MI) comprises first actuator means (1,2) provided with extensible telescopic components (C1, C2) adapted to support and move at least one said part (SE) of said reclining

upholstered furniture (MI) between a closed position (PC) and an extended position (PE), and second actuator means (7,10,13,14) for actuating said extensible telescopic components (C1, C2).

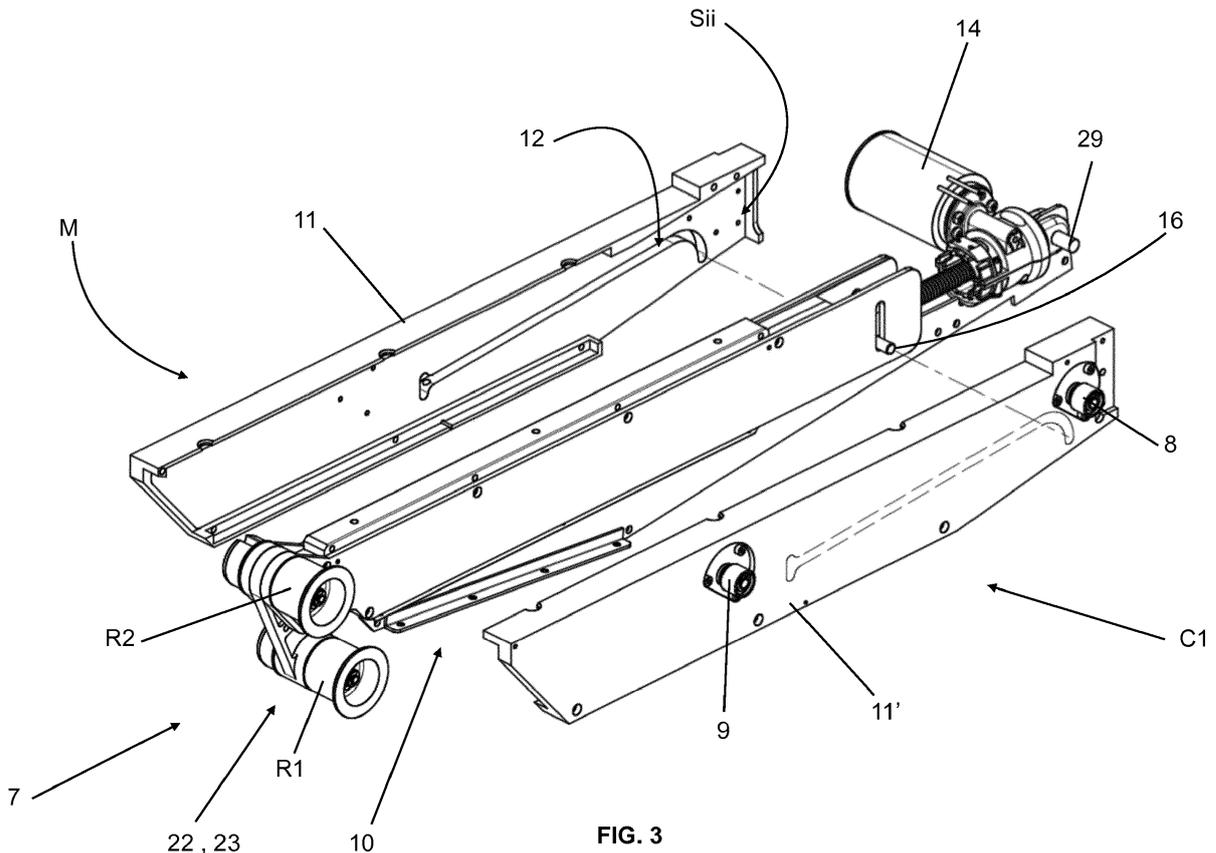


FIG. 3

Description

[0001] The present invention relates to a movement mechanism.

[0002] The present invention is advantageously used in the field of furnishings upholstered furniture and it is applicable in recliner chair, or in a sofa with at least one recliner place, for moving mobile parts, in particular the sitting of the cited reclining armchair or sofa, or even footrest, back-rests and the like, to which the following description will make explicit reference without thereby losing generality.

[0003] Generally, in the upholstered furniture industry mechanisms are known for the movement of mobile parts of a chair or a reclining sofa defined by hinged articulated quadrilateral type-like levers to move such movable parts between a reclined closed position and an open position of maximum extension adapted to realize a configuration of the chair or sofa known as "relax" position.

[0004] Currently such articulated mechanisms made of metallic material are very bulky, and are subject to easy wear out.

[0005] In addition, the hinged lever and articulated wishbones cause security problems related to the danger of shearing and cutting: in order to solve these problems, the upholstery of the chair or sofa should be geared to cover the mechanism and prevent people and pets can be damaged.

[0006] This safety requirement requires construction of upholstered structures aesthetically forced and heavy because they have to cover the mechanism.

[0007] Furthermore, the shapes of such mechanisms are often not satisfactory from the aesthetic point of view, and do not integrate well with the design features of the armchairs or sofas supporting such mechanisms.

[0008] The purpose of the present invention is therefore to provide a movement mechanism which is free from the drawbacks of prior art specified above.

[0009] In particular, the aim of the present invention is to provide an efficient and durable movement mechanism, so as to drastically reduce the possibility of wear out and breakage during functional operation, as well as to users safety problems.

[0010] A further object of the present invention is to provide a movement mechanism that integrates perfectly and optimally with the aesthetic shapes of the armchairs or sofas designs.

[0011] The structural and functional characteristics of the present invention and its advantages will become even more clear and evident from the underlying claims, and in particular from an examination of the description that follows, referring to the attached figures, which show a preferred but not limiting embodiment of the mechanism of in object, in which:

- Figure 1 shows in a schematic perspective view exemplifying a frame structure of a recliner supporting the mechanism in object and in a closed operating

position;

- Figure 2 shows a perspective schematic exploded view and on an enlarged scale of a preferred embodiment of the moving mechanism in object;
- 5 - Figure 3 shows a perspective schematic exploded view and on an enlarged scale of some components of the mechanism of Figure 1;
- Figure 4 shows a perspective schematic exploded view and on an enlarged scale of some components of the mechanism of Figure 3;
- 10 - Figures 5a, 5b and 5c show respective schematic side views of three different operating positions of the mechanism of the present invention and illustrated in Figures 2 to 4.

[0012] With reference to Figure 1, with T is generally indicated a frame structure (trunk) of a mobile recliner upholstered MI, such as a reclining chair or sofa with movable parts, such frame T, also provided with armrests (known and not shown), is adapted to carry mounted a movement mechanism M according to the present invention to move in particular the upholstered sitting

[0013] SE (also including footrest) of the mobile recliner upholstered MI.

[0014] The mechanism M is of the extensible type-like components with telescopic mode and comprises, preferably but not limited to, two movement groups 1 and 2 coupled to the frame T, in particular a group 1 mounted on an L1 side of the frame T and the other group 2 mounted on an opposite side L2 of the frame T, then with specular shape.

[0015] As shown in Figure 2, each group 1, 2 comprises a pair 3 of profiled elements 4 and 4' adapted to be formed so as to have, each, in correspondence of a inner surface Si, of curvilinear hollow seats 5 and 6.

[0016] The elements 4 and 4' are coupled on the opposite side laterally to actuator member 7 provided with free-rotatable rollers 8 and 9 and so as to protrude both sides of the same actuator member 7, so that such rollers 8 and 9 go to be inserted inside the respective seats 5 and 6 of each element 4 and 4' for sliding, in use, within the same seats 5.

[0017] As shown more clearly in Figure 3, the actuator member 7 comprises a central body actuator 10 coupled and closed laterally by two profiled elements 11 and 11' supporting externally the rollers 8 and 9 and defining a pair of elements C1.

[0018] The two elements 11 and 11' of the pair C1 are shaped so as to have, each, in correspondence with its own inner surface Sii, a curvilinear hollow seat 12.

[0019] As shown more clearly in Figure 4, the actuator body 10 is of the linear type and comprises an shaft screw element 13 connected to an electric drive motor 14 for moving said element 13, in a clockwise rotating direction or, alternatively, in a opposite counterclockwise direction, so as to bring a block 15, provided with a pin 16 which protrudes from both sides of the said block 15 and sliding on said element 13, to slide to and from the electric motor

14 on the central body 10. The central body 10 is closed laterally by a pair C2 of plates 17, 17', each of which plates 17,17' mounted to a free end 18,19 a pivotable arm element 20,21 supporting a pair 22,23 of elements, preferably but not limited to rollers R1 and R2 rollers for supporting an openeable footrest (not shown), while the opposite 24,25 end with respect to end 18,19 each plate 17,17' is provided with a hollow seat 26,27 arranged transversely with respect to the respective plate 17,17'.

[0020] Each seat 26,27 is adapted to be engaged by a respective portion of the pin 16 projecting from the block 15 to move forward or backward the plates 17, and 17' of the couple C2.

[0021] As shown in Figures 5a to 5c, in use, the mechanism M so structured, with the upper surfaces of the elements 4,4' and 11,11' supporting the mentioned sitting SE of the reclining mobile MI and under the thrust of the electric motor 14 suitably operated by a user of the mobile MI, is adapted to move the sitting SE itself between a closed position PC (Figure 5a), which corresponds to substantially erected user's bust, and an open extended position PE, and then reclined (Figure 5c) known as "relax", passing through a substantially intermediate position PI (Figure 5b) only partially extended.

[0022] In other words, by controlling the drive of the motor 14 which activates the actuator member 7, the progressive movement of the elements 11,11' of the pair C1 is firstly obtained up to a maximum extension configuration of the same elements 11,11' in said intermediate position PI, then gradually the movement of the plates 17,17' of the pair C2 up to a configuration of maximum extension of the same elements 17,17' in the aforementioned extended position PE, and vice versa to return the sitting SE in the closed position PC.

[0023] It's to be noted that, in correspondence of the cited extended position PE, the footrest above mentioned can be rotated upwards around the axis of R2 to thereby further increase the extent of the sitting SE of the upholstered furniture MI.

[0024] To the central body 10 is also mechanically connected, through a pin 29 of the same central body 10, a known hinged bar type-like element 28 (Figure 2 and Figures 5a - 5c) adapted to support, in a known manner and not illustrated, a backrest (also known and not illustrated) in such a way that the cited positions PC and PE correspond to a similar movement of the backrest concordant with that one of the sitting SE, i.e. with the element 28 that varies its inclination allowing to the backrest connected to it to recline backwards, simultaneously to the extension of the sitting SE or only later so allowing to get the so-called position "TV" (user's legs up and bust erected to watch a TV screen).

[0025] All the above parts of the mechanism M described above, with the exception of the shaft element 13 made of steel or equivalent, may advantageously be implemented in various types of material, also non-metallic such as plastic, Teflon, various composite materials such as carbon fiber or equivalent, so as to ensure re-

sistance and excellent durability and at the same time giving light weight and reliability.

5 Claims

1. Movement Mechanism (M) for moving the mobile parts (SE) of a reclining upholstered furniture (MI), **characterized in that** it comprises first actuator means (1,2) provided with extensible telescopic components (C1, C2) adapted to support and move at least one said part (SE) of said reclining upholstered furniture (MI) between a closed position (PC) and an extended position (PE) and second actuator means (7,10,13,14) for actuating said telescopic extensible telescopic components (C1,C2).
2. Mechanism according to claim 1, **characterized in that** the said movable part includes the sitting (SE) of the said reclining upholstered furniture (MI).
3. Mechanism according to claim 1 or 2, **characterized in that** the said upholstered furniture (MI) comprises a reclining armchair or sofa.
4. Mechanism according to one or more of previous claims 1 to 3, **characterized in that** the said first actuator means (1,2) comprise at least one group (1,2) of said telescopic extensible components (C1, C2).
5. Mechanism according to one or more of previous claims 1 to 4, **characterized in that** said first actuator means (1,2) comprise two groups (1,2) of said telescopic extensible components (C1, C2), each said group (1,2) being arranged one from the the opposite side of the other (2,1) with respect to said movable part (SE) of said reclining upholstered furniture (MI).
6. Mechanism according to claim 5, **characterized in that** each said group (1,2) comprises at least two sliding elements (C1,C2) sliding one in respect to the other, said second actuator means (7,10,13,14) comprising shaft screw element (13) mechanically connected to said sliding elements (C1, C2) and to electric motor means (14).
7. Mechanism according to claim 6, **characterized in that** the said electric motor means (14) are also connected to an hinged bar type-like element (28) adapted to let to recline and lift a backrest of said upholstered furniture (MI).
8. Mechanism according to one or more of the previous claims 4 to 7, **characterized in that** said sliding elements (C1, C2) comprise a first pair (C1) of profiled elements (11,11') adapted to enclose an actuator member (7) of said actuating means (7,10,13,14),

and a second pair (C2) of plates (17,17 ') adapted to enclose a central body (10) of said actuator member (7).

9. Mechanism according to claim 8, **characterized in that** each said plate (17,17') of said second pair (C2) of plates (17,17') mounts at its one free end (18,19) a pivotable arm element (20,21), said arm element (20,21) being adapted to rotatably support a footrest made to rotate about an axis to be extended in raised position.

10. Reclining upholstered furniture (MI) supporting mechanism (M) according to one or more of the previous claims 1 to 9.

20

25

30

35

40

45

50

55

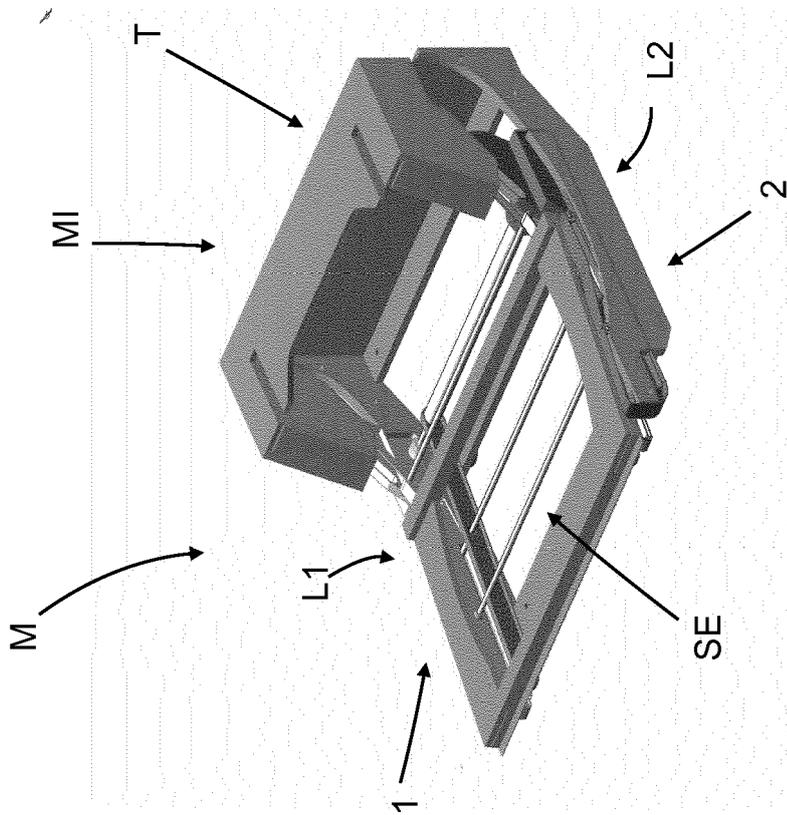


FIG. 1

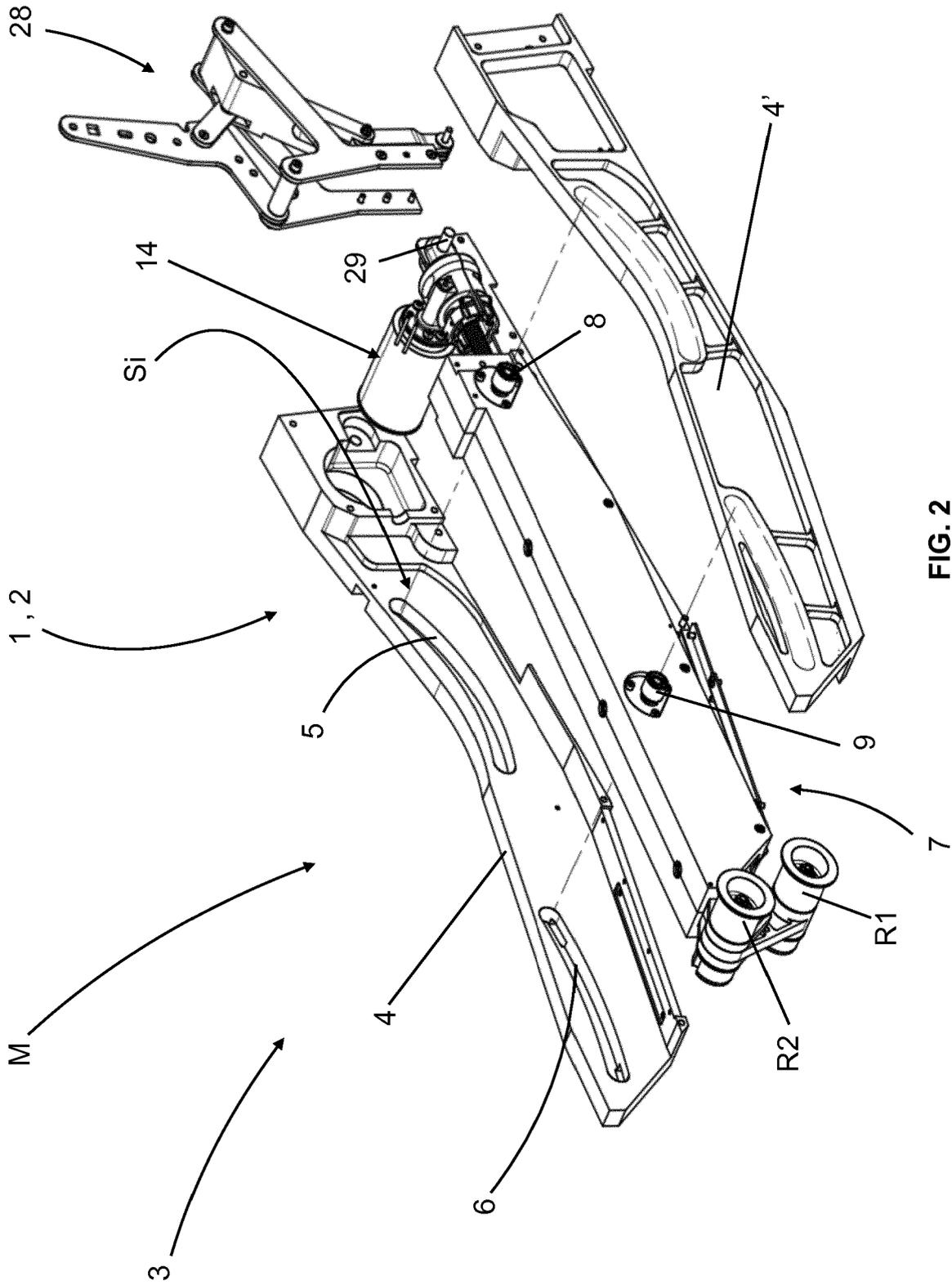


FIG. 2

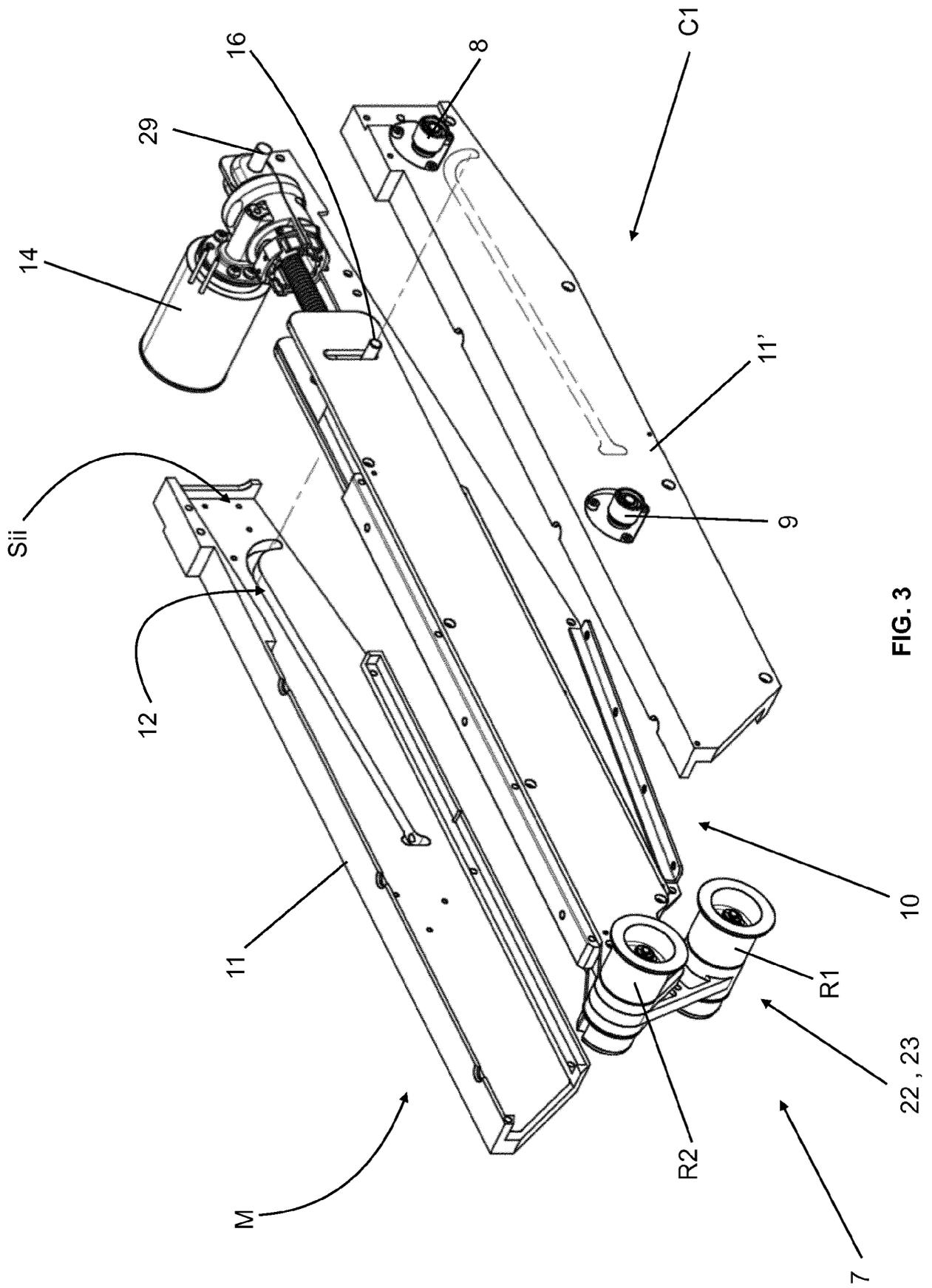
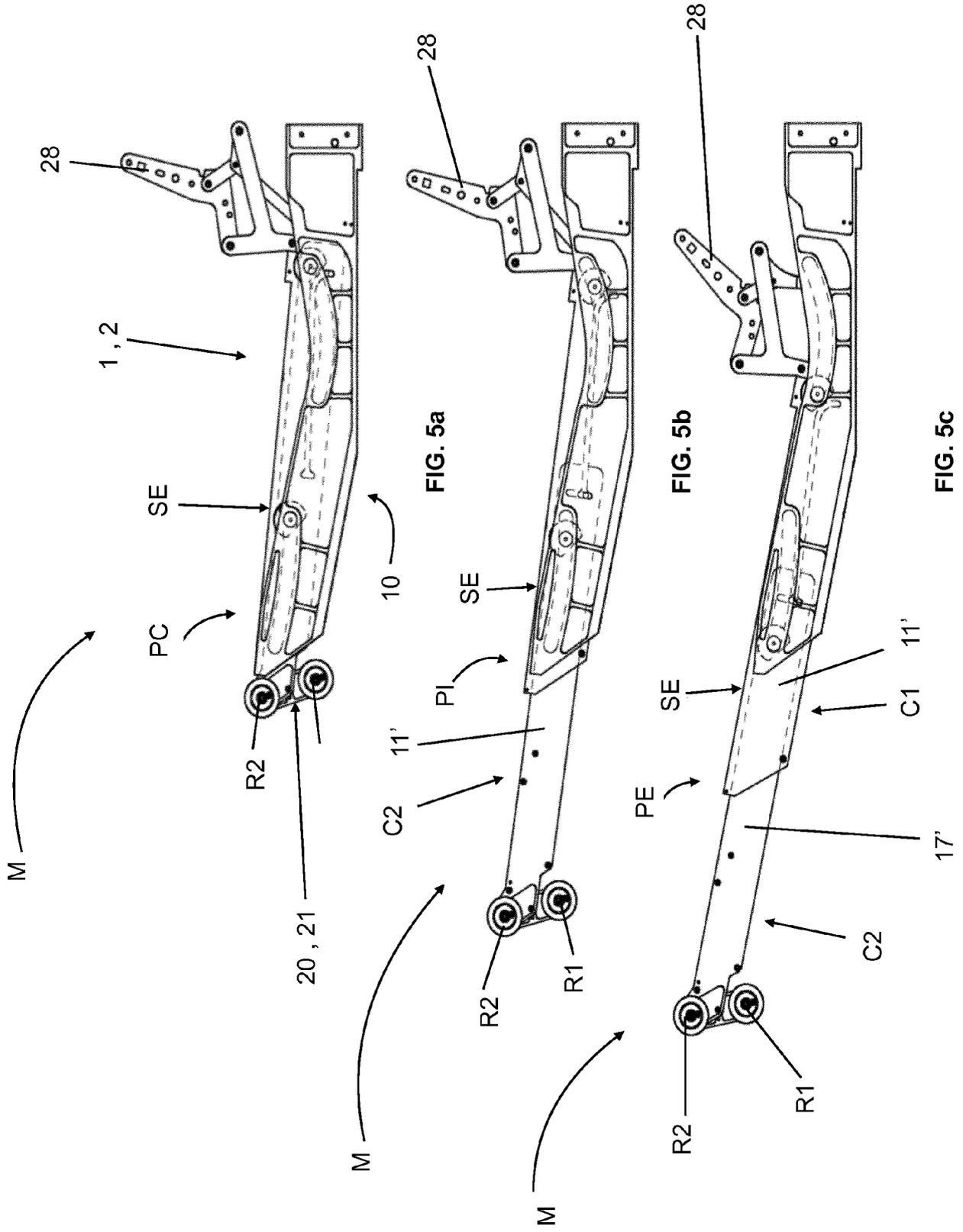


FIG. 3





EUROPEAN SEARCH REPORT

Application Number
EP 16 19 6494

5

10

15

20

25

30

35

40

45

50

55

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 A	US 2015/272329 A1 (LAWSON GREGORY MARK [US]) 1 October 2015 (2015-10-01) * paragraph [0012] - paragraph [0050]; figures 1-18 *	1-7,10 8,9	INV. A47C1/035 A47C7/50
X	US 2014/312660 A1 (NATUZZI PASQUALE [IT]) 23 October 2014 (2014-10-23) * sentence 26, paragraph 11; figures 1-3 *	1-3,10	
X	DE 20 2006 018505 U1 (DEWERT ANTRIEBS SYSTEMTECH [DE]) 17 April 2008 (2008-04-17) * paragraph [0036] - paragraph [0060]; figures 1-6 *	1-3	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47C F16H
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 7 April 2017	Examiner Lehe, Jörn
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	

EPO FORM 1503 03/02 (P04C01)

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

EP 16 19 6494

5

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-04-2017

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2015272329 A1	01-10-2015	CN 106211751 A	07-12-2016
		US 2015272329 A1	01-10-2015
		WO 2015148920 A1	01-10-2015

US 2014312660 A1	23-10-2014	CN 104080370 A	01-10-2014
		EP 2770878 A1	03-09-2014
		ES 2572511 T3	31-05-2016
		IT RM20110166 U1	27-04-2013
		US 2014312660 A1	23-10-2014
		WO 2013061259 A1	02-05-2013

DE 202006018505 U1	17-04-2008	AT 496239 T	15-02-2011
		CN 101636600 A	27-01-2010
		DE 202006018505 U1	17-04-2008
		DK 2087258 T3	16-05-2011
		EP 2087258 A1	12-08-2009
		ES 2359654 T3	25-05-2011
		US 2010139428 A1	10-06-2010
		WO 2008068143 A1	12-06-2008

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82