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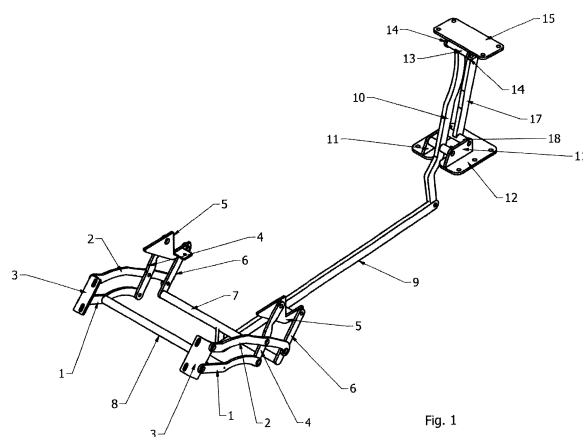
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(54) **A UNIT FOR THE CHANGE OF BACKREST AND FOOTREST POSITION OF A LEISURE FURNITURE**

(57) The subject of the invention is a unit for the change of footrest position of a leisure furniture, to be used in leisure furniture in order to change the relative position of the footrest and backrest compared to the seat, in accordance with the user's requirements.

A unit for the change of the position of the backrest and the footrest of a leisure furniture in the form of a footrest attachment mechanism and a backrest attachment mechanism, characterized in that the footrest attachment mechanism has two pantograph mechanisms, each in the form of a lower arm 1 and upper arm 2, to which, at their front edges the footrest bases 3 are attached in a rotating manner, and the lower arm 1 at the opposite edge is attached in a rotating manner to the front connector 4, which in its centre zone is attached in a rotating manner to the upper arm 2, and in its end zone to a support 5 mounted in the leisure furniture frame, to which also the rear connector 6 is mounted, connected in the centre zone in a rotating manner with the end of the lower arm 1, whereas in the end zone the rear connector 6 has a rotationally mounted rear arm 7 for the connection with the second pantograph connector 6, whereas the lower arms 1 of both pantographs are connected in their centre zones with the front arm 8, moreover the rear arm 7 is connected by a pull rod 9 attached in a rotating manner to the edge of the arm 10, mounted in a rotating manner approximately in the middle zone at the base plate 12 support 11, whereas from the second edge to an axis 13 embedded in the supports 14 of the base plate 15 of the backrest mounting support mecha-

nism, whereas the supports 14 have an arm 17 placed on the axis, connected with the support 11 axis 18.



Description

[0001] The subject of the invention is a unit for the change of footrest position of a leisure furniture, to be used in leisure furniture in order to change the relative position of the footrest and backrest compared to the seat, in accordance with the user's requirements.

[0002] In the US 2016/0073785 patent description a solution was presented, in which the footrest moves on a scissor support mechanism and has no kinematic connection with the backrest mounting mechanism.

[0003] In the PL 405547 patent filing a convertible armchair was presented with an independent backrest, unfolding to three positions, activated by pressing on the armrest, whereas the backrest adjustment is independent from the unfolding mechanisms. The armchair is characterised by the longitudinal seat bars, mounted on transverse bars, having in their rear zones arms for the mounting of the backrest arms, whereas the lower arms of the levers are connected by a crossbar, and in the front zone having a symmetric scissor mechanism for the movement of the footrest, whereas the scissor elements are connected by a crossbar, and actuator cylinders being placed between the crossbars and/or transverse bars and crossbars.

[0004] A furniture for sitting presented in the Polish description PL 174683 is known, transforming into a furniture for lying down, with a protracting part with a furniture padding for the placement of legs, which is placed below the part for sitting, and a mechanism slides out, with the raising hardware fixed to the sides of the part sliding out, using which the furniture padding is raised to the level equal to the height of the seat level, and each raising hardware has in the slid out position of the part for lying down on the part on the opposite side of the part for sitting down a directing arm, which is attached in an articulated manner both to the frame part of the furniture padding and to the side girder assigned to it, whereas the opposite side of the raising hardware is equipped with a directing connector attached in an articulated manner both to the connecting arm connected with the frame part and to the side girder. Theoretical articulation points of each of the directing connectors in the area of the connection with the connecting arm and side girder are located in the direction of the part for sitting, on the outside of the surface of a horizontal projection of the part for lying down, and the points of rotation of the directing connector and directing lever are placed above the upper edge of their assigned side girder, and the connecting arm is bent away with its free end side towards the part for sitting. This solution enables assuming a semi-reclined position and requires significant strength.

[0005] The goal of the solution according to the invention is a construction of a mechanism, which will reduce the strength required to slide out the footrest, which may be particularly important for elderly persons.

The essence of the solution, which is a unit for the change of the position of the backrest and the footrest of a leisure

furniture in the form of a footrest attachment mechanism and a backrest attachment mechanism, consists of the footrest attachment mechanism having two pantograph mechanisms, each in the form of a lower arm and upper arm, to which, at their front edges the footrest bases are attached in a rotating manner, and the lower arm at the opposite edge is attached in a rotating manner to the front connector, which in its centre zone is attached in a rotating manner to the upper arm, and in its end zone to a support mounted in the leisure furniture frame, to which also the rear connector is mounted, connected in the centre zone in a rotating manner with the end of the lower arm, whereas in the end zone the rear connector has a rotationally mounted rear arm for the connection with the second pantograph connector, whereas the lower arms of both pantographs are connected in their centre zones with the front arm, moreover the rear arm is connected by a pull rod attached in a rotating manner to the edge of the arm, mounted in a rotating manner approximately in the middle zone at the base plate support, whereas from the second edge to an axis embedded in the supports of the base plate of the backrest mounting support mechanism, whereas the supports have an arm placed on the axis, connected with the support axis.

[0006] It is advantageous when to the plate support an electric actuator is attached on an axis, with a controller, with the opposite end attached to the axis placed on the pull rod.

[0007] This unit structure enables the construction of a furniture which enables changing the position of the sitting person to a semi-reclined without having to stand up, which is particularly useful for elderly persons and persons with disabilities. Moreover significant strength is not required to change the position of the unit. It is possible to retract the backrest by approx. 320 mm and simultaneously change the backrest inclination by 6-8°. The structure is light and not visible when the footrest is folded.

[0008] The subject of the invention, in an example, but not limiting, implementation was presented on the figure, where on fig. 1 the unit for extending the footrest is presented in a perspective view, fig. 2 presents the unit for extending the footrest in a side view, in a position with the footrest not extended, fig. 3 presents the unit for extending the footrest in a side view, in a position with the footrest in an intermediate extension position, fig. 4 presents the unit for extending the footrest in a side view, in a position with the footrest fully extended, whereas on fig. 5 the unit was presented in a version with an electrical actuator, fig. 6 presents the leisure furniture in a cross section in a folded position, fig. 7 presents the leisure furniture in a cross section in an intermediate position, and fig. 8 presents the leisure furniture in a cross section in an unfolded position.

[0009] A unit for the change of backrest and footrest position of a leisure furniture in the form of a footrest attachment mechanism and a backrest attachment mechanism, having two pantograph mechanisms, each

in the form of a lower arm 1 and upper arm 2, to which, at their front edges the footrest 3 bases are attached in a rotating manner. The lower arm 1 at the opposite edge is attached in a rotating manner to the front connector 4, which in its centre zone is attached in a rotating manner to the upper arm 2, and in its end zone to a support 5 mounted in the leisure furniture frame, to which also the rear connector 6 is mounted, connected in the centre zone in a rotating manner with the end of the upper arm 2. In the end zone the rear connector 6 has a rotationally mounted rear arm 7 for the connection with the second pantograph connector 6, whereas the lower arms 1 of both pantographs are connected in their centre zones with the front arm 8. Moreover the rear arm 7 is connected by a pull rod 9 attached in a rotating manner to the edge of the arm 10, mounted in a rotating manner approximately in the middle zone at the base plate 12 support 11, whereas from the second edge to an axis 13 embedded in the supports 14 of the base plate 15 of the backrest mounting support mechanism. The supports 14 have an arm 17 placed on the axis 16, connected with the support 11 axis 18.

[0010] There are version where to the support 19 of the plate 22 is connected by a screw with the base of the backrest mechanism base 12, mounted on the axis 20 the electric actuator 21 with a controller not shown on the figure, with the opposite end attached to the axis 22 placed on the pull rod 9.

[0011] On the figure the footrest mounted to the base 3 was not shown, nor the backrest mounted to the plate 15.

[0012] In the first position, where the furniture has a closed footrest, the backrest is in the most vertical position. After taking a position on the leisure furniture, advantageously a sofa, by slightly raising the backrest and exerting stronger pressure it is possible to move the backrest support mechanism by approx. 32 cm. The backrest will tilt backwards by an angle of 6-8°, there will be a relative movement of the arm 17 in relation to the axis 18 and the tilting of the plate 15. This will result in the rotation of the arm 10 in relation to the support 11 axis and movement of its lower edge forwards. This movement will result in the movement of the pull rod 9 forwards and the movement of the rear arm 7 forwards. The layout of the pantographs will result in the supports 3 of the footrest will be placed in a position that is approximately horizontal and approximately parallel to the plane of the seat of the leisure furniture.

[0013] Folding the mechanism to its original position is conducted by increasing the pressure on the footrest and bringing it to an approximately vertical position. The pantograph system will then move the pull rod 9 backwards, resulting in the rotation of the arm 10 around the support 11 axis and movement of the plate 15 to an approximately horizontal position, while bringing the backrest to a vertical position and moving it forward.

In the version with the electrical actuator 21, it is activated by a controller and moves the pull rod 9 forwards, moving

the footrest forwards and inclining the backrest and moving it backwards, or from this position moves the pull rod 9 backwards, bringing the backrest to a vertical position and moving it forward in the manner described above while lowering the footrest.

Claims

1. A unit for the change of the position of the backrest and the footrest of a leisure furniture in the form of a footrest attachment mechanism and a backrest attachment mechanism, **characterized in that** of the footrest attachment mechanism having two pantograph mechanisms, each in the form of a lower arm 1 and upper arm 2, to which, at their front edges the footrest bases 3 are attached in a rotating manner, and the lower arm 1 at the opposite edge is attached in a rotating manner to the front connector 4, which in its centre zone is attached in a rotating manner to the upper arm 2, and in its end zone to a support 5 mounted in the leisure furniture frame, to which also the rear connector 6 is mounted, connected in the centre zone in a rotating manner with the end of the lower arm 1, whereas in the end zone the rear connector 6 has a rotationally mounted rear arm 7 for the connection with the second pantograph connector 6, whereas the lower arms 1 of both pantographs are connected in their centre zones with the front arm 8, moreover the rear arm 7 is connected by a pull rod 9 attached in a rotating manner to the edge of the arm 10, mounted in a rotating manner approximately in the middle zone at the base plate 12 support 11, whereas from the second edge to an axis 13 embedded in the supports 14 of the base plate 15 of the backrest mounting support mechanism, whereas the supports 14 have an arm 17 placed on the axis, connected with the support 11 axis 18.
2. A unit in accordance with claim 1 **characterized in that** to the plate 23 support 19 an electric actuator 21 is attached on an axis 20, with a controller, with the opposite end attached to the axis 22 placed on the pull rod 9.

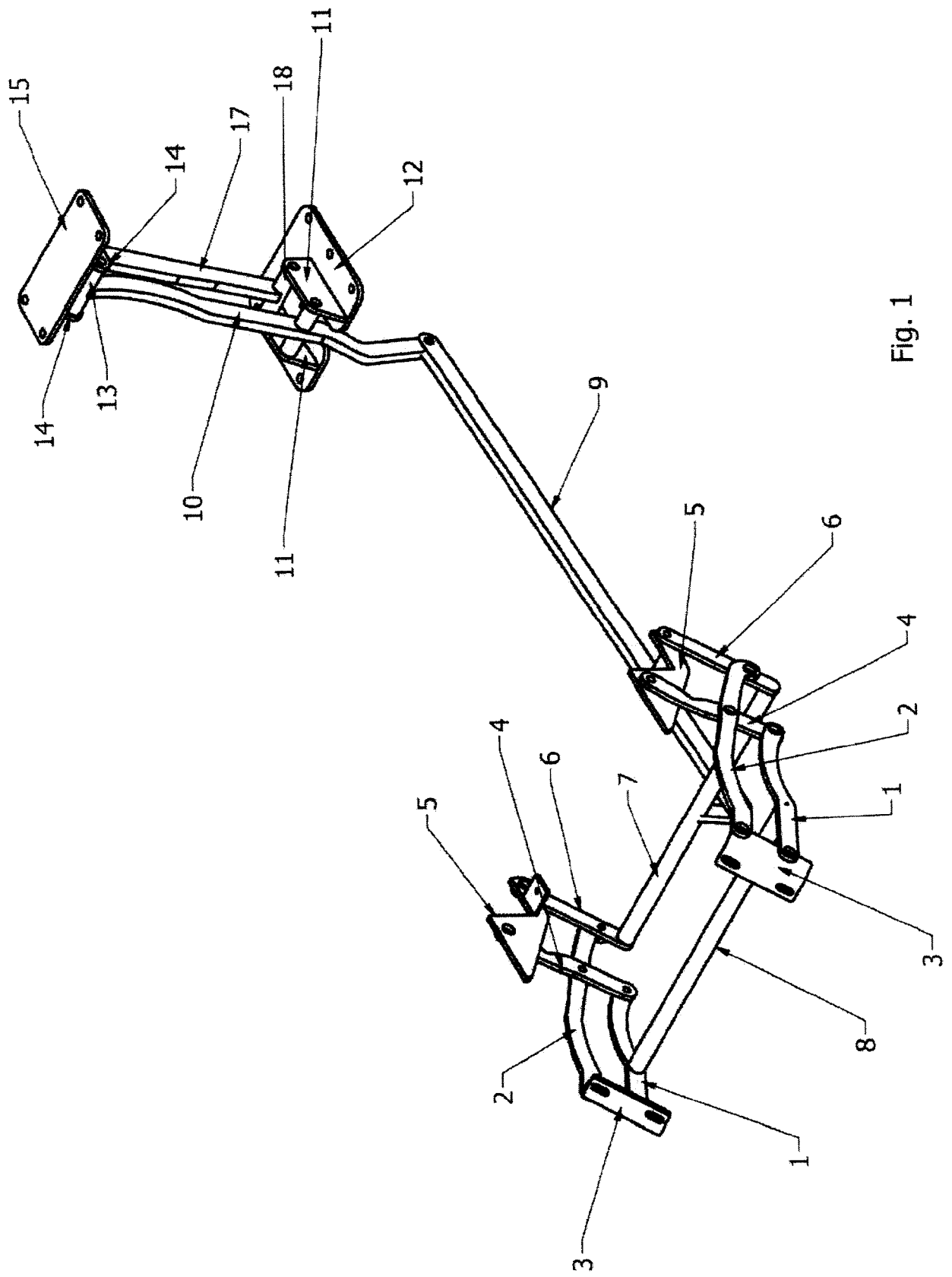


Fig. 1

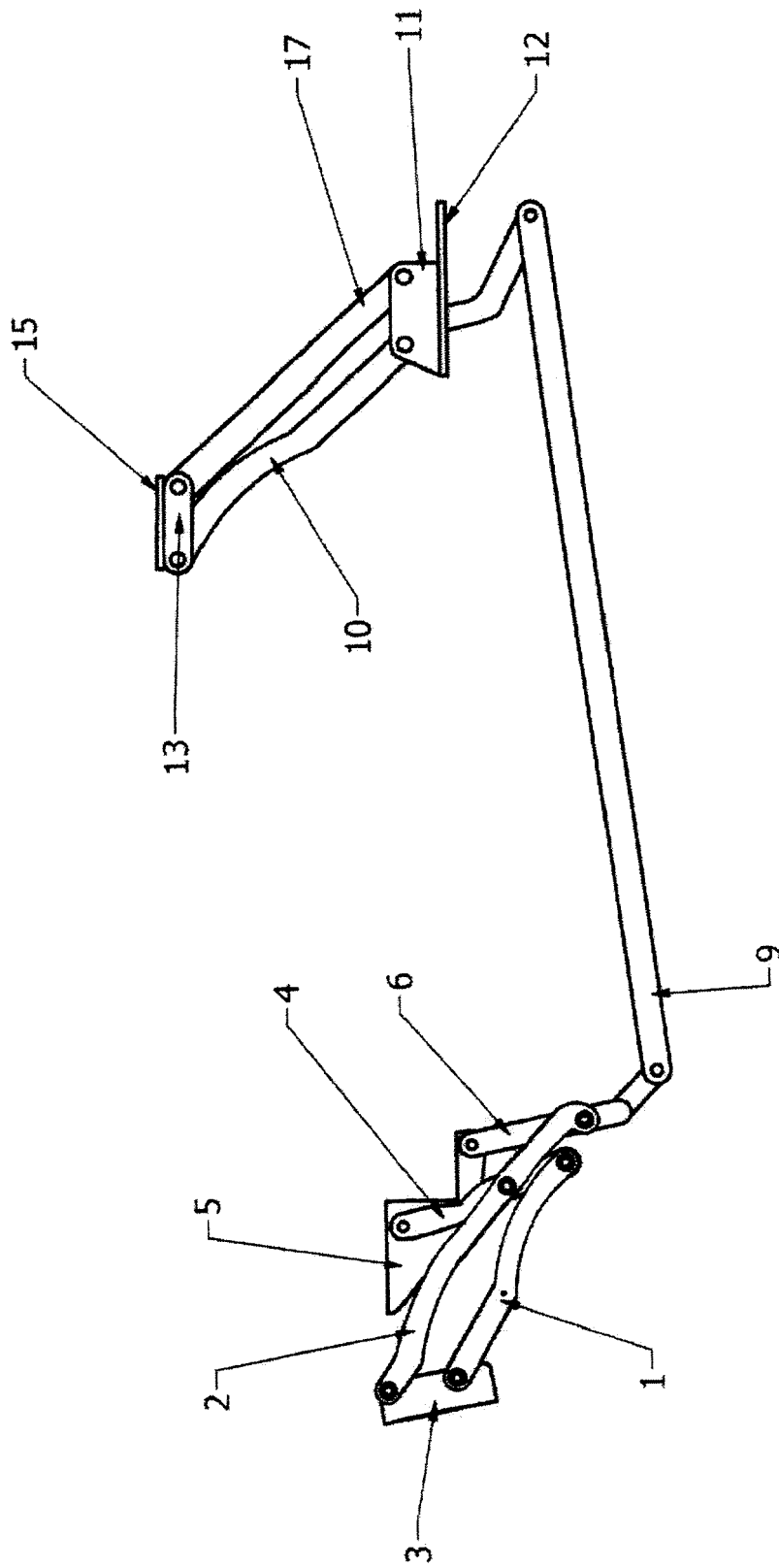


Fig. 2

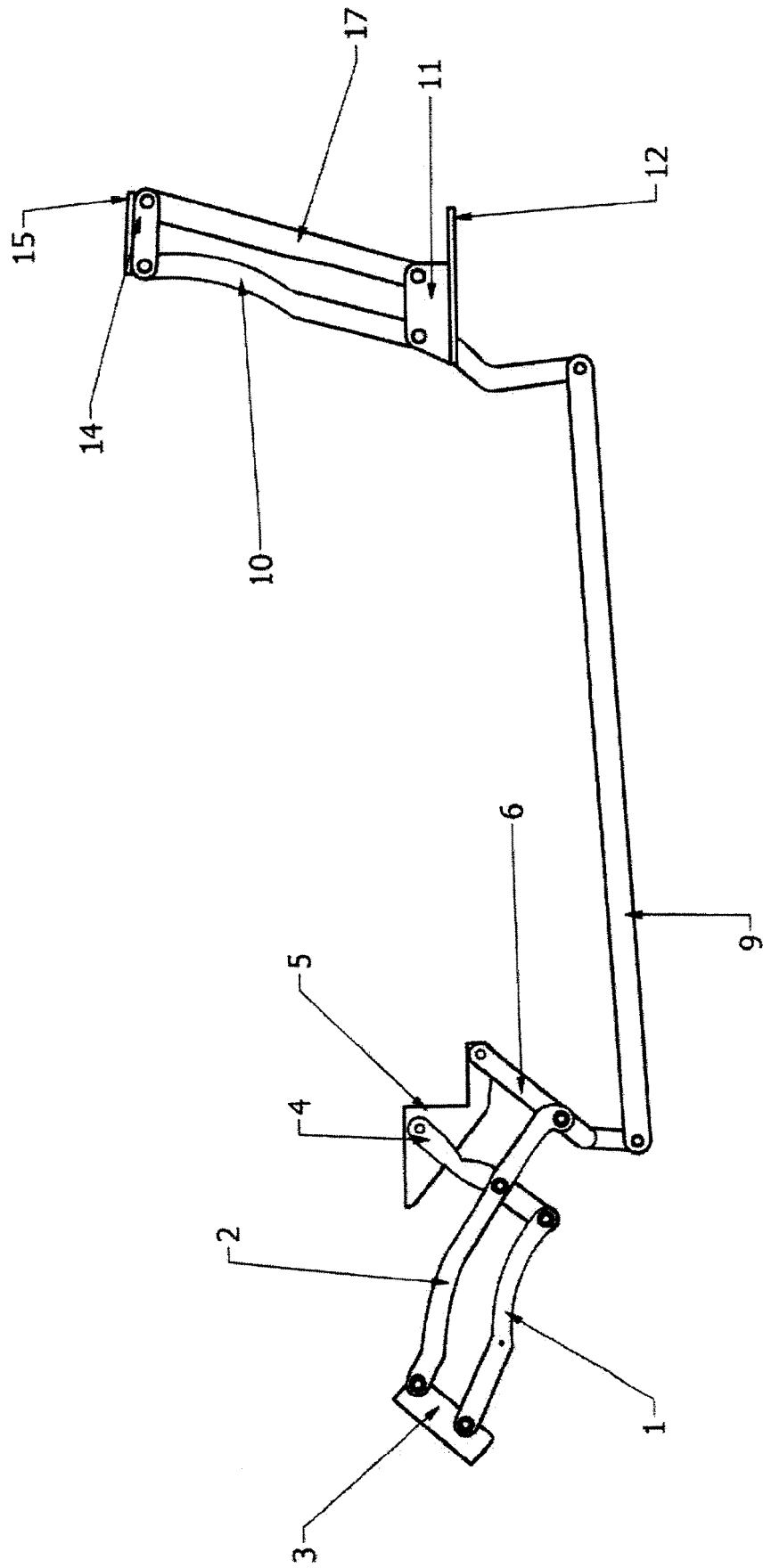


Fig. 3

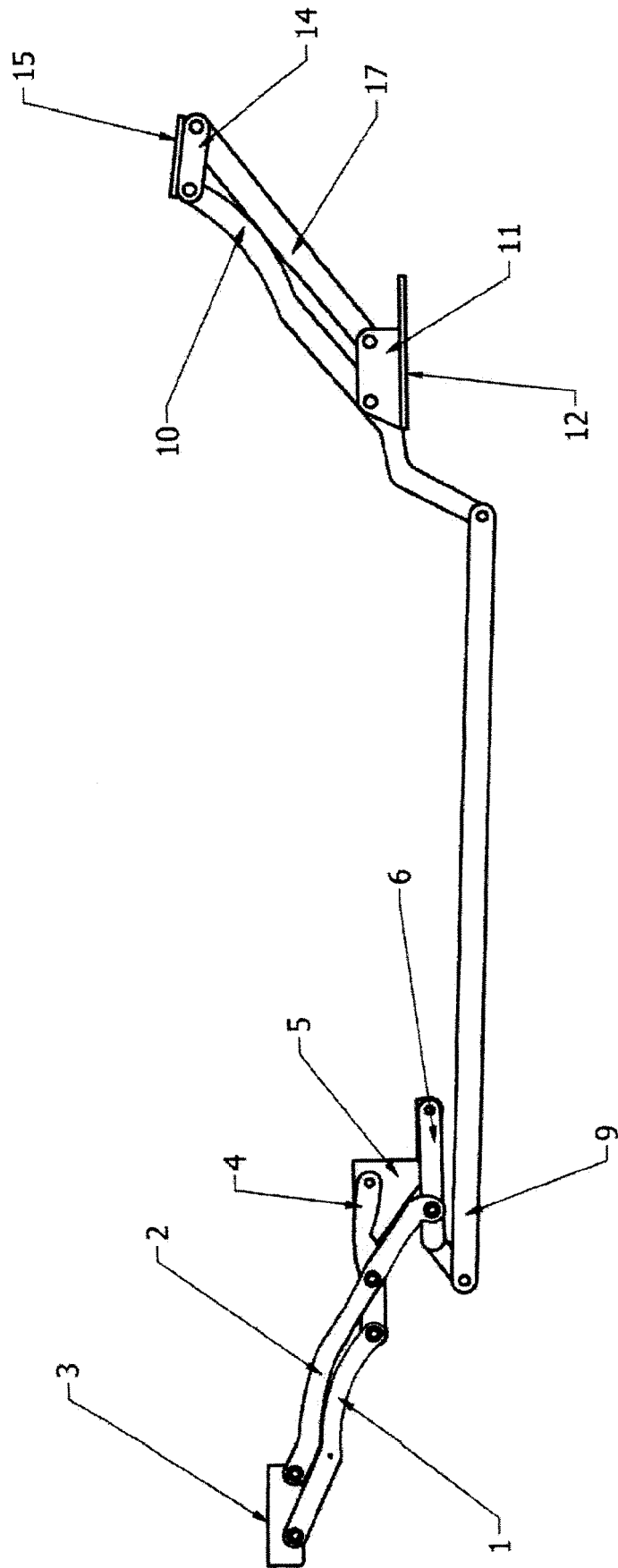


Fig. 4

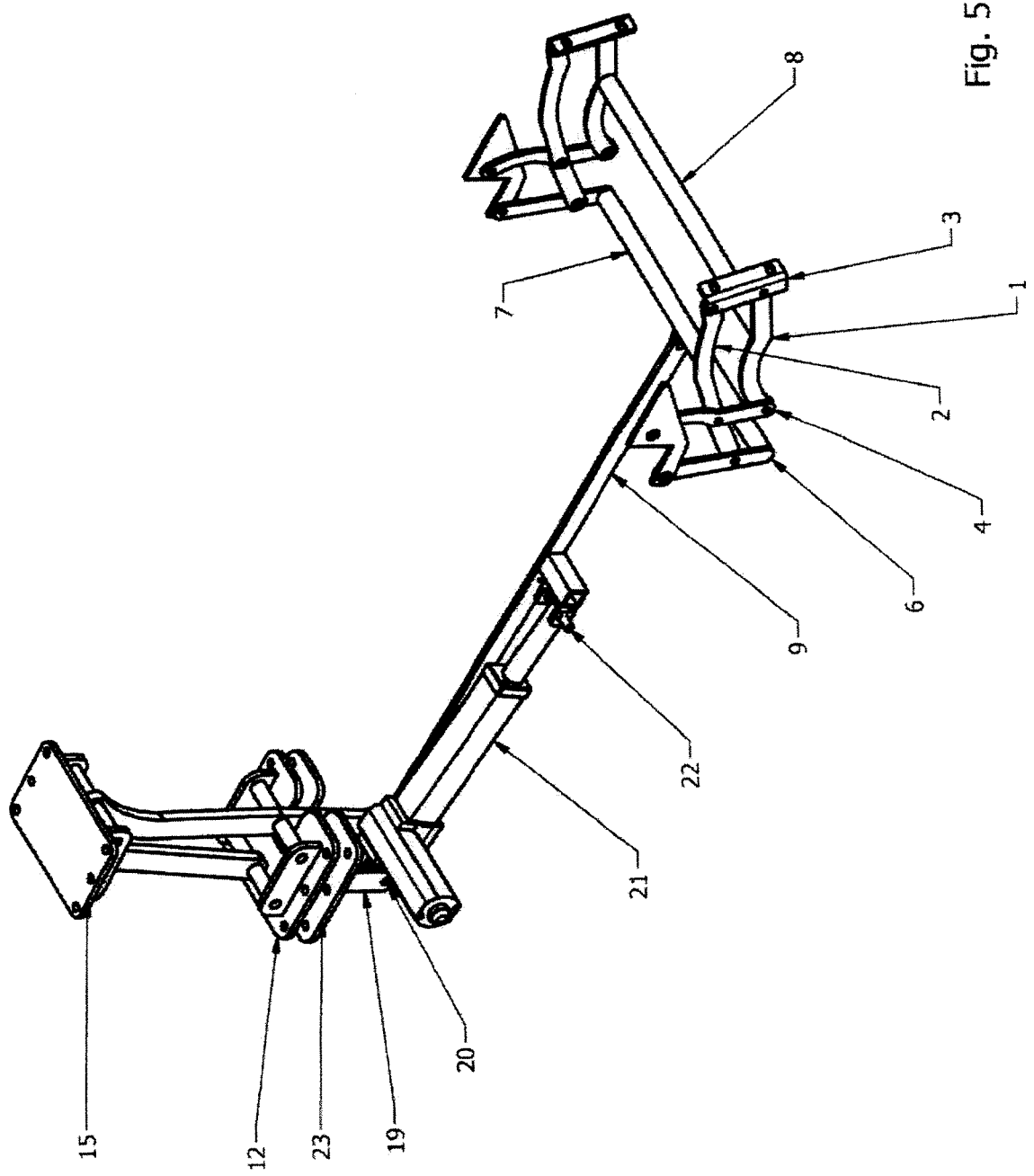
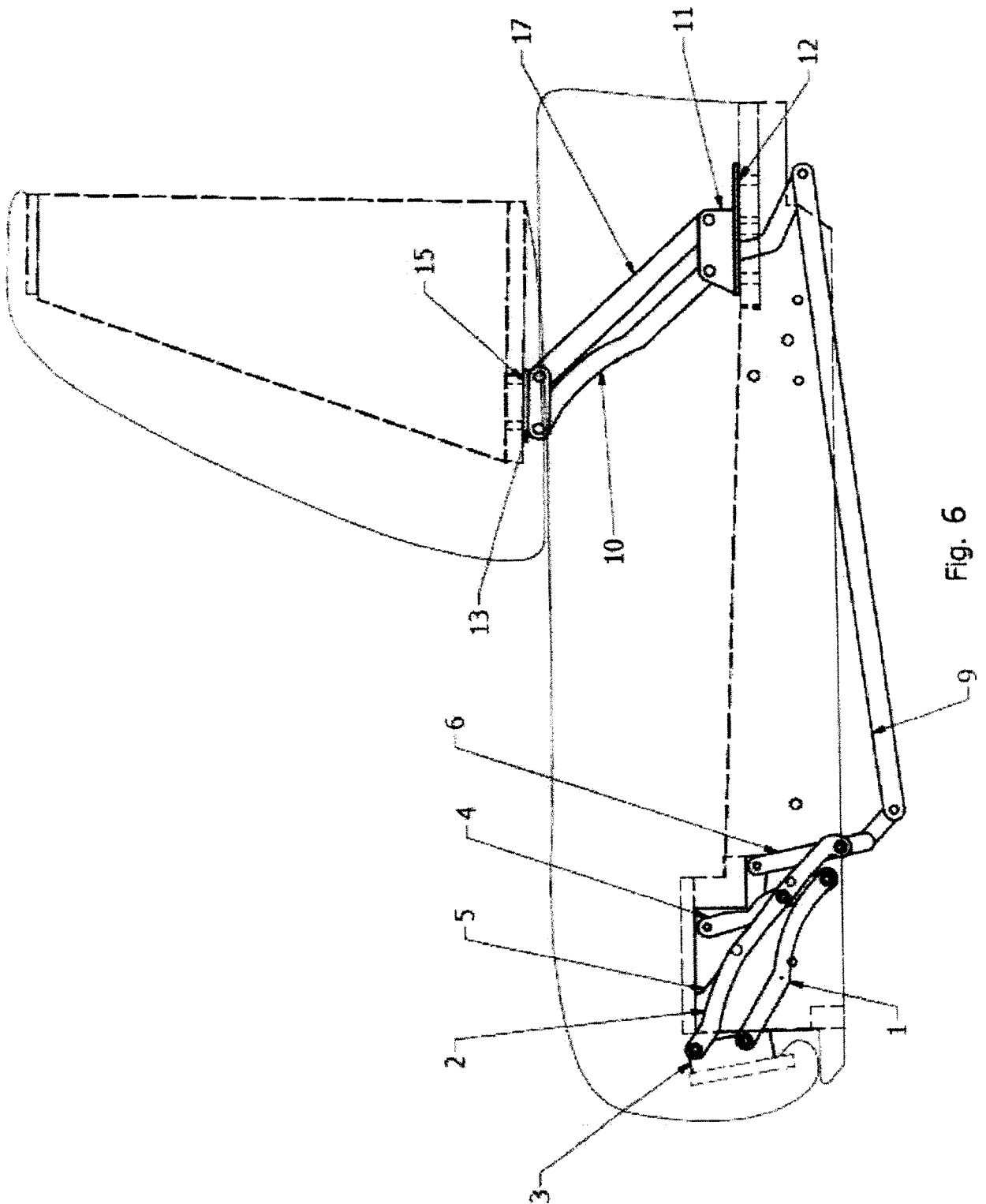


Fig. 5



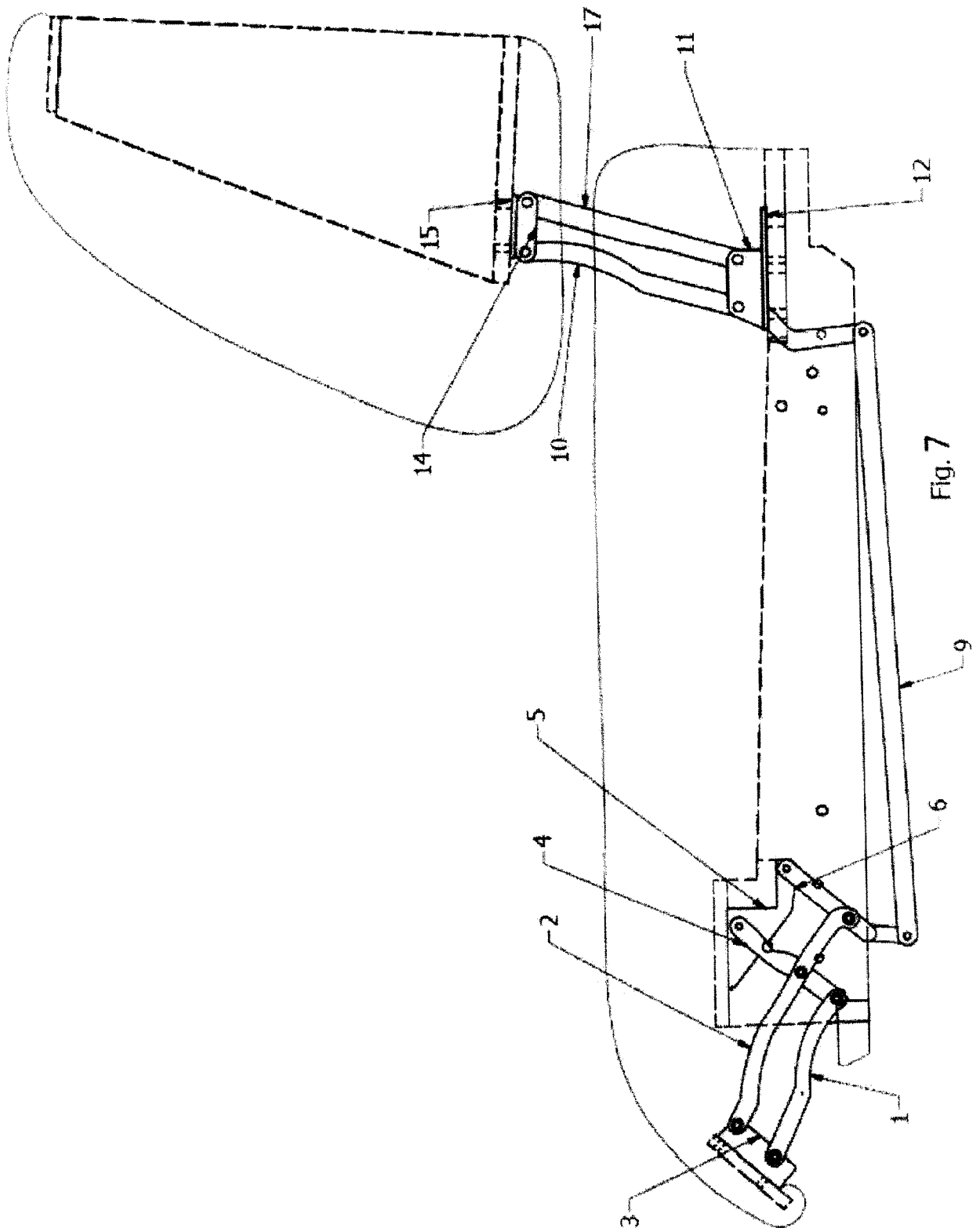


Fig. 7

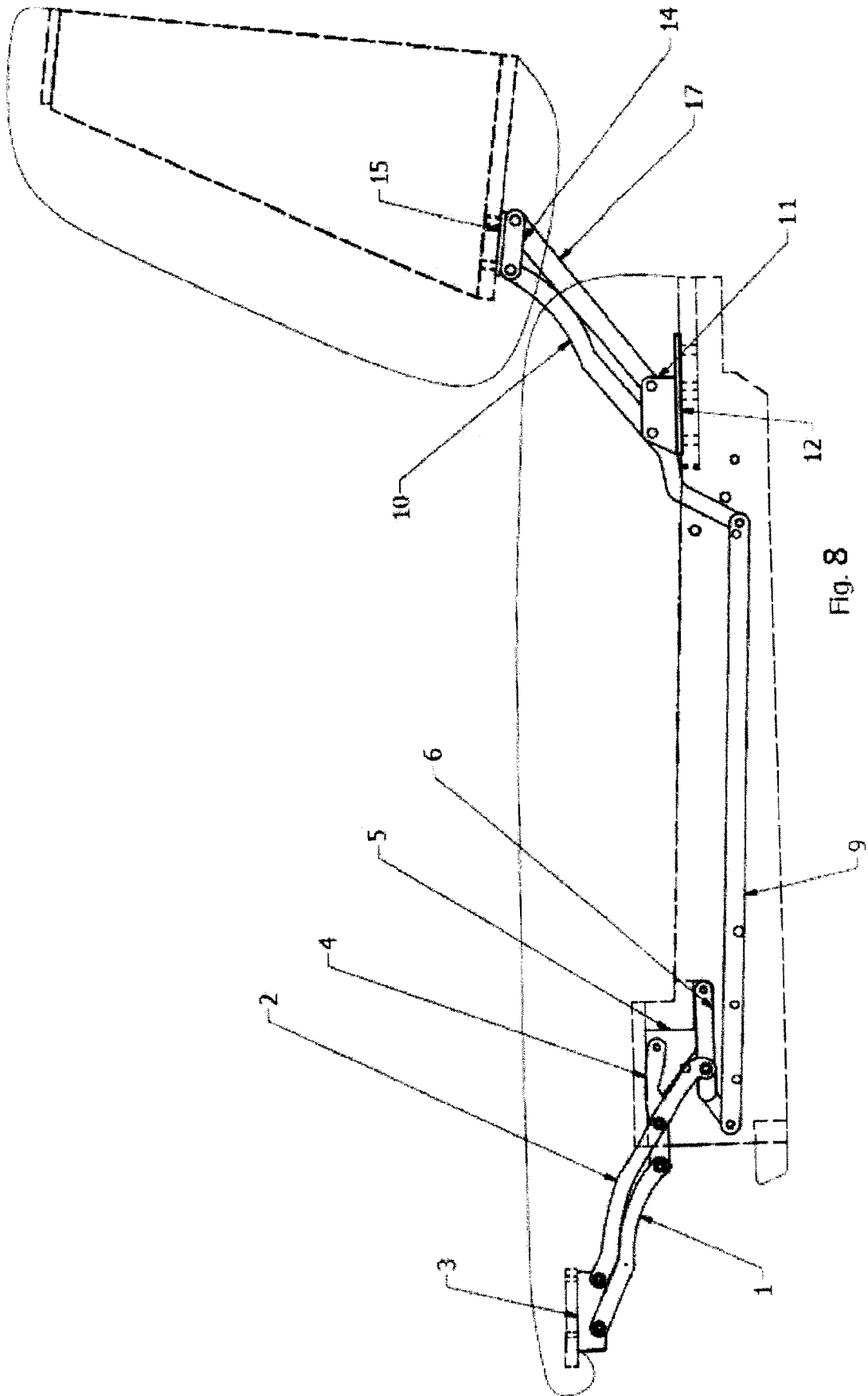


Fig. 8



EUROPEAN SEARCH REPORT

Application Number
EP 18 46 0029

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A	DE 20 2015 105292 U1 (LIN CHANG CHEN [TW]) 16 October 2015 (2015-10-16) * figures *	1,2	
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 5 October 2018	Examiner Amghar, Norddin
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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