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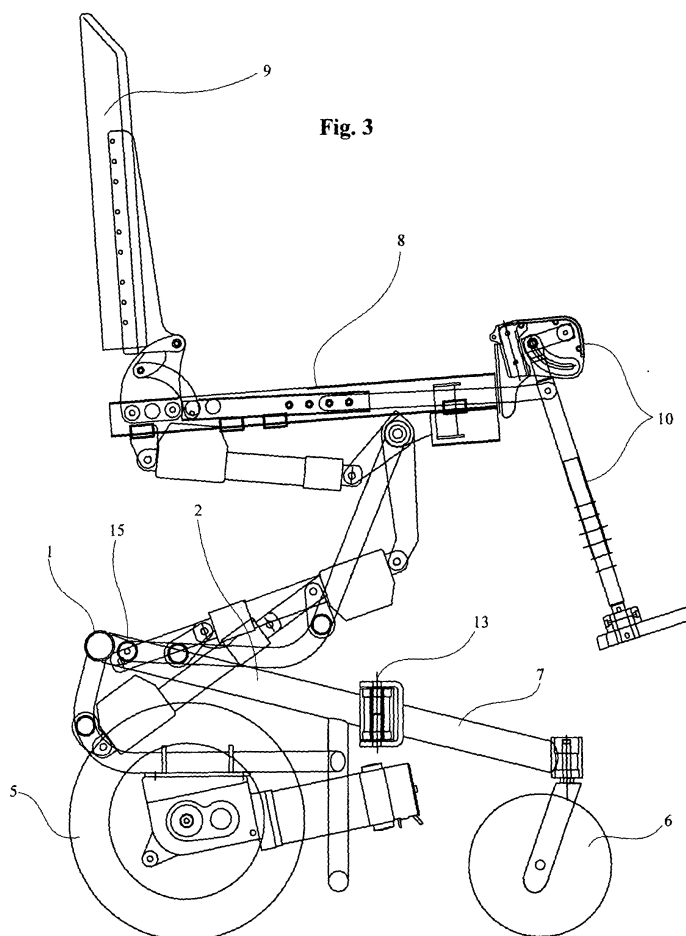
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(54) **Wheelchair for rehabilitation which verticalizes of improved type**

(57) It is about a wheelchair for rehabilitation able to increase the level of the seat (8) and to verticalize (9,8,10), that simultaneously with its adjustments 'of level provide to enlarge the front wheels (6) so that they are

free to orientate without interfere with the supporting device (10) of the footplates and the same footplates (11), receding from the outside advanced position in the space defined by the laying of the wheels (5,6) to the ground.



Description

[0001] In the market for the rehabilitation of determined categories of disabled exist different solutions of wheelchairs that tilt and verticalize to allow to the users to become in upstanding position and among the other performances allows also to adjust the height of the seating.

[0002] There are different solutions that allow obtaining these performances using different systems of levers and linkages usually settled by oildynamic devices provided with suitable motors and referred electric batteries.

[0003] One of the disadvantages of the said wheelchairs of marketing is made so that the adjustment of the level of the seating and particularly in the verticalization of the fulcrum of the user raises in comparison to the laying plane of the wheels and the all stability in the sideways decreases so that also for little drops of the ground can be reached the limits of danger.

[0004] Another disadvantage of the said wheelchairs in the market is given by the fact that while the seat in the normal using level the footplates(footplates) and the referred support which result to be forwarded in comparison to the front wheels, so that during the steering manoeuvre both the footplates and the support that sustains them don't interfere with the said front wheels, so that the encumbrance in the width of the footplates and the device that supports them could be corresponding to that one usually adopted by all the other type of wheelchairs, when instead the wheelchairs place in verticalization the footplates and the device which supports them, retracted from the advanced position inside of the space defined by the laying to the floor of the four wheels, and because they don't interfere with the front wheels during the steering, it's necessary that both the footplates and the referred supporting systems are reduced in encumbrance.

[0005] This causes a serious discomfort for the user who is obliged to maintain tightened his legs and to keep the feet almost jointed, and further it is compromised the stability of the person in order to maintain the upstanding.

[0006] To limit such discomfort it is therefore necessary that the wheels have limited dimensions, and therefore all the verticalizing wheelchairs are supplied in the front with front wheels for indoor use.

[0007] It would be therefore not possible due to the encumbrance of the wheels for outdoor use, forecast a verticalizing wheelchair with the said outdoor wheels in the front, because there wouldn't physically be the spaces for the footplates.

[0008] The aim of this patent is that one to adjust the opening in width of the front wheels simultaneously to the increase of the level of the seating until reaching the verticalization. In such way it is granted the stability of the wheelchair in the sideways, because the open front wheels can be freely steered and it is allowed to maintain the normal width of the footplate and the referred supporting device. Therefore it is avoided the user to maintain the legs tightened, closed up, but instead he can maintain the legs in the normal position of a seated person

and the feet in the position of an upstanding person.

[0009] The system to obtain the opening of the front wheels with the simultaneous adjustment of the level of the seating until reaching the verticalization can be made on the most different ways and therefore they are binding.

[0010] A further aim of this patent is that one to equip a normal verticalizing wheelchair with wheels for outdoor maintaining the necessary spaces for a comfortable position of the footplate and a referred comfortable position for the user seated on, of the wheelchair.

[0011] A further aim of this patent is that one to be able to equip a normal wheelchair for outdoor with the function of verticalization.

[0012] What has been previously explained is clarified on the enclosed drawings where the considered case has to be considered only as an exemplification and therefore not limitative.

Figure 1 shows in transparency the framework of the wheelchair from the look down view from the under seating when the seating is drawn in broken lines the position of the maximum width reached by the front wheels when the wheelchair has reached the verticalization.

Figure 2 is the side view of the wheelchair corresponding to figure 1.

Figure 3 is the side view of the wheelchair represented in figure 2 with the level of the seat increased in comparison to the starting one. It doesn't appear in the figure the increase of the opening of the front wheels.

[0013] The fig. 4 shows the wheelchair represented in the previous figure in the verticalizing position. It results the almost alignment of the backrest, of the seat and of the supporting device of the footplate retracted inside the laying pointsof the wheels on the ground. It doesn't result from the figure the opening of the front wheels (as shown in hatching in the fig. 1) which can turn without interfering with the footplates.

[0014] From the examination of the figures it results that the carrying structure composed by the framing 1,2,3,4 and by the two arms 7 is supported by the rear wheels 5 and by the front wheels 6 and supports by a combination of kinematic machanisms and pullers the seating 8 to which is connected the backrest 9 and the device 10 supoorting the footplates 11.

[0015] The said wheelchair which is part of the wheelchairs for rehabilitation which by kinematic mechanisms and referred motorization allows the adjustment of the level of the seat until the verticalization is characterized by the fact that contemporarely to the adjustment of the level until the reaching of the verticalization provide to enlarge the front wheels 6 to increase the stability in the sideways to the raising of the fulcrum and in the way that the said wheels 6 can turn without interfering with the footplates 11 when they retract from the forwarded position into the space defined by the points of laying to the

floor of the wheels 5 and 6.

[0016] The enlargement of the front wheels 6 is performed as following: each of the two vertical revolving pins 18 for the orientation of the front wheels 6 is supported to the edge of a lever arm 7 having fulcrum the said lever 7 in parallel to the free edge of the element 2 of the carrying framing 1,2,3,4.

[0017] The lever arm 12 opposed to the arm 7 is connected by hinging to the edge of a pole 14, which edge opposed to the said pole 14 is connected by hinging to the lever arm 16 jointed to a turning shaft 15.

[0018] The said shaft 15 is placed in rotation contemporarily to the raising of the seating 8 and until the verticalization of the backrest 9, of the seating 8 and of the device 10 which supports the footplates 11, moved the lever 16 which at its turn by the pole 14 moves the lever 12 and consequently the the arm 7 which moves outwards the revolving pin 18 and the wheel 6 beneath.

[0019] The return of the wheels 6 in their position of lowered wheelchair happens contemporarily to the reset of the wheelchair from the verticalized position to the lowered position and all the moving referred to the system of the elements 7,12,14,15,16, is performed in the opposite sense by the reset of the footplates in the forward external position.

[0020] In addition to the enlarging of the front wheels 6 it can be made also the enlarging of the rear wheels 5 by devices and/or systems also different from what described as exemplification for the front wheels where the enlarging connected to the adjustment of the level of the seating determines also this one an increase of the stability on sideway.

[0021] Very advantageously for the stability, in the case where the wheelchair is equipped with front drive, or is not equipped with it, and it is a wheelchair with raising seating it is appropriate to have it equipped with the function of increase of the stability by the enlarging of its base by the placing outwards of the rear wheels.

[0022] Indeed in this last case, due that in a wheelchair with the raising seating the fulcrum is moved far backwards, towards the rear wheels, it is appropriate to enlarge these last ones for the maintaining in safety the user who is seating on the said wheelchair.

[0023] In this last case not having particular problems of encumbrance the wheelchair can be equipped with both indoor and outdoor wheels.

[0024] Everything previously described and pictured demonstrate the value of the inventive power of the patent which revolutionize a system already consolidated in the manufacture of wheelchairs for rehabilitation with the adjustment of the level of the seating reaching also the verticalization.

[0025] Therefore it doesn't go out from the patent for solutions also ameliorative, which could be actuated by persons of that field in case of using the teachings of this patent.

Claims

1. Wheelchair for rehabilitation which verticalizes of improved type **characterized by** the fact to own a frame which allows the verticalization of the person seated on it, the said frame is composed in a hinged way of backrest, seating and footplates device, contemporarily with the elevation of the seating (8) and until the verticalization of the backrest (9) of the seating (8) the front wheels (6) open outwards increasing the laying base.
2. Wheelchair for the rehabilitation which verticalizes of improved type following the claim 1 **characterized by** the fact that the outwards opening of the front wheels (6) is such to allow to the said wheels(6) to turn without intefering with the footplates(11) and the referred devices which support them (10) when the above said footplates (11) and the referred devices which support them (10) from the outwards advanced position, enter in the space defined by the laying of the wheels (5,6) on the ground.
3. Wheelchair for rehabilitation which verticalizes of improved type following the claim 1 or 2 **characterized by** the fact the moving of opening (and of return to the starting position) of each front wheel (6) is performed by a shaft (15)which rotates contemporarily to the adjustment of the level of the seating (8)and until the verticalization (8,9,10), which shaft (15) in the rotation moves the arm (16) jointed to it which from its side by a connection pole (14) moves one of the arms (12) of lever (13) having fulcrum parallel to the edges of an element (2) of the carrying framing (1,2,3,4) determining the movement of the opposite arm (7) to which edge is supported the vertical turning pin (18)for the orientation of the beneath wheel (6).
4. Wheelchair for the rehabilitation which verticalizes of improved type following claims 1 or 2 or 3 **characterized by** the fact that are enlarged the rear wheels (5) contemporarily to the adjustment of the level of the seating (8) and until the verticalization of the backrest (9) of the seating (8) and of the supporting device (10) of the footplates (11), arising the referred moving from one of the elements which compose the ensemble of the kinematic mechanisms, pullers or other which provides to the said adjustment.
5. Wheelchair for the rehabilitation following one or more of the previous claims modified by the fact that the wheels which open outwards to increase the laying base of the wheelchair are wheels for outdoor use.
6. Wheelchair for the rehabilitation following one or

more of the previous claims modified by the fact that it is a wheelchair for outdoor use, eventually electrically motorized, to which is implemented the function of adjustment of the level of the seating (8) and/or the verticalizing function.

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Fig. 1

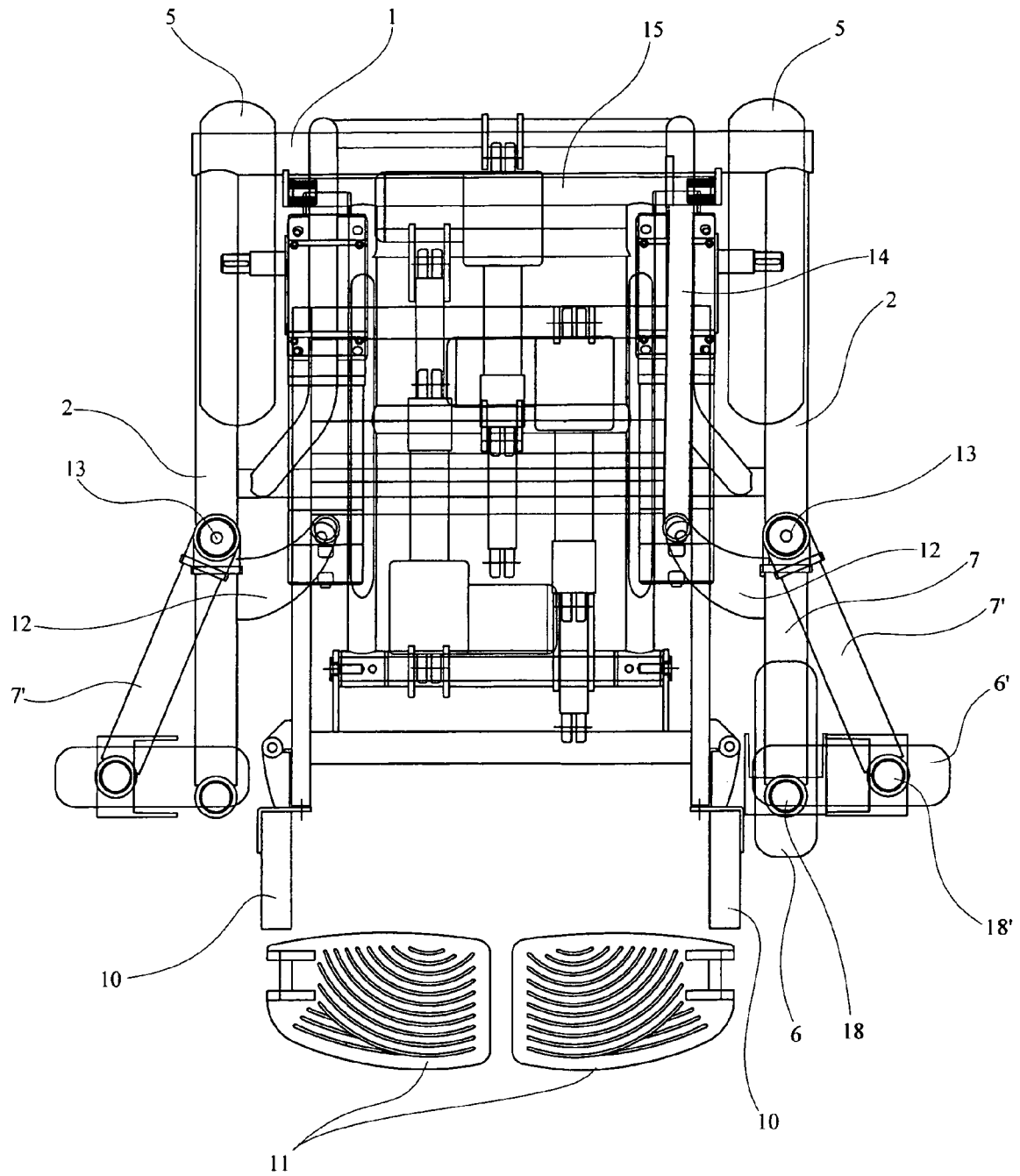
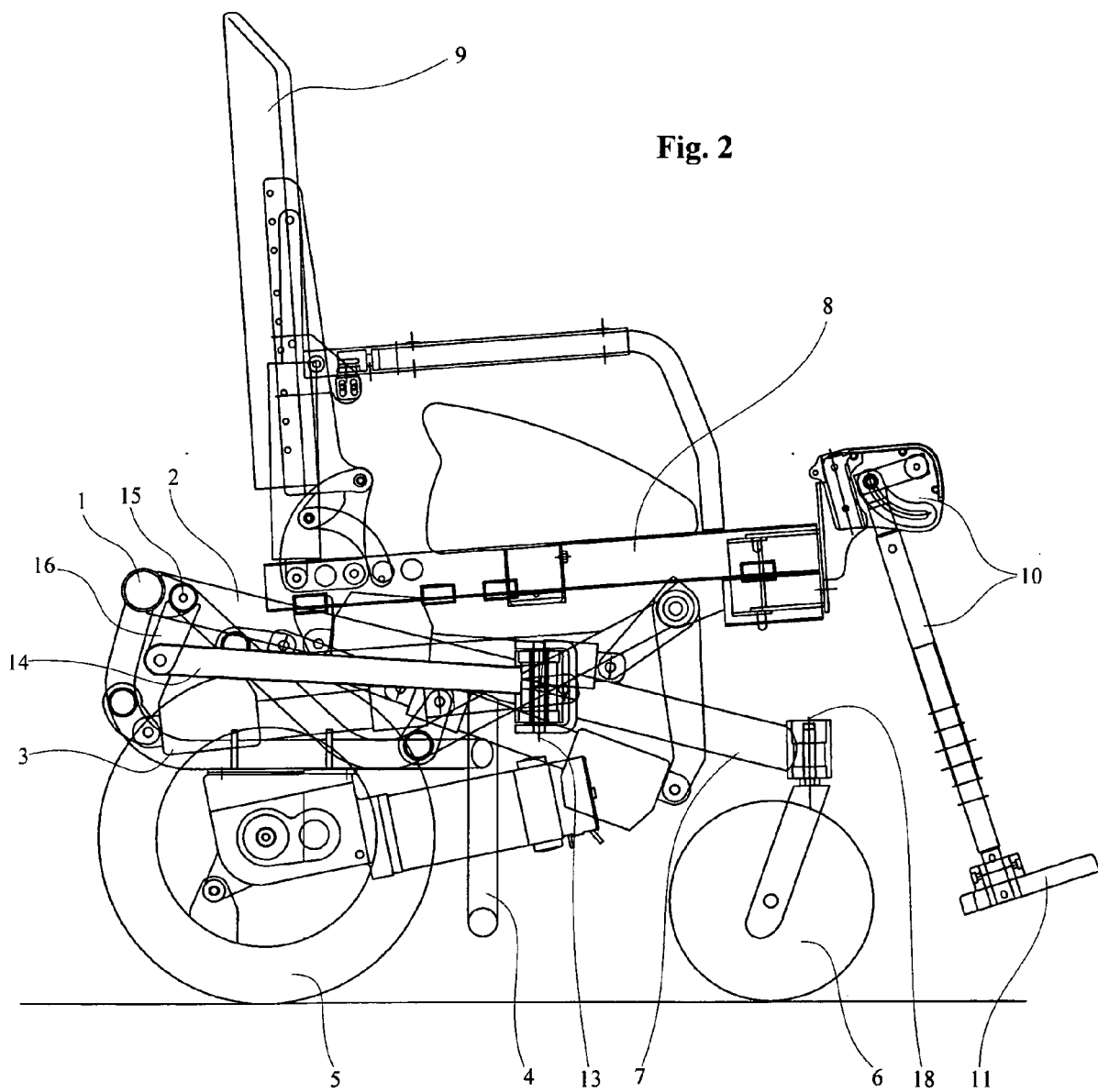


Fig. 2



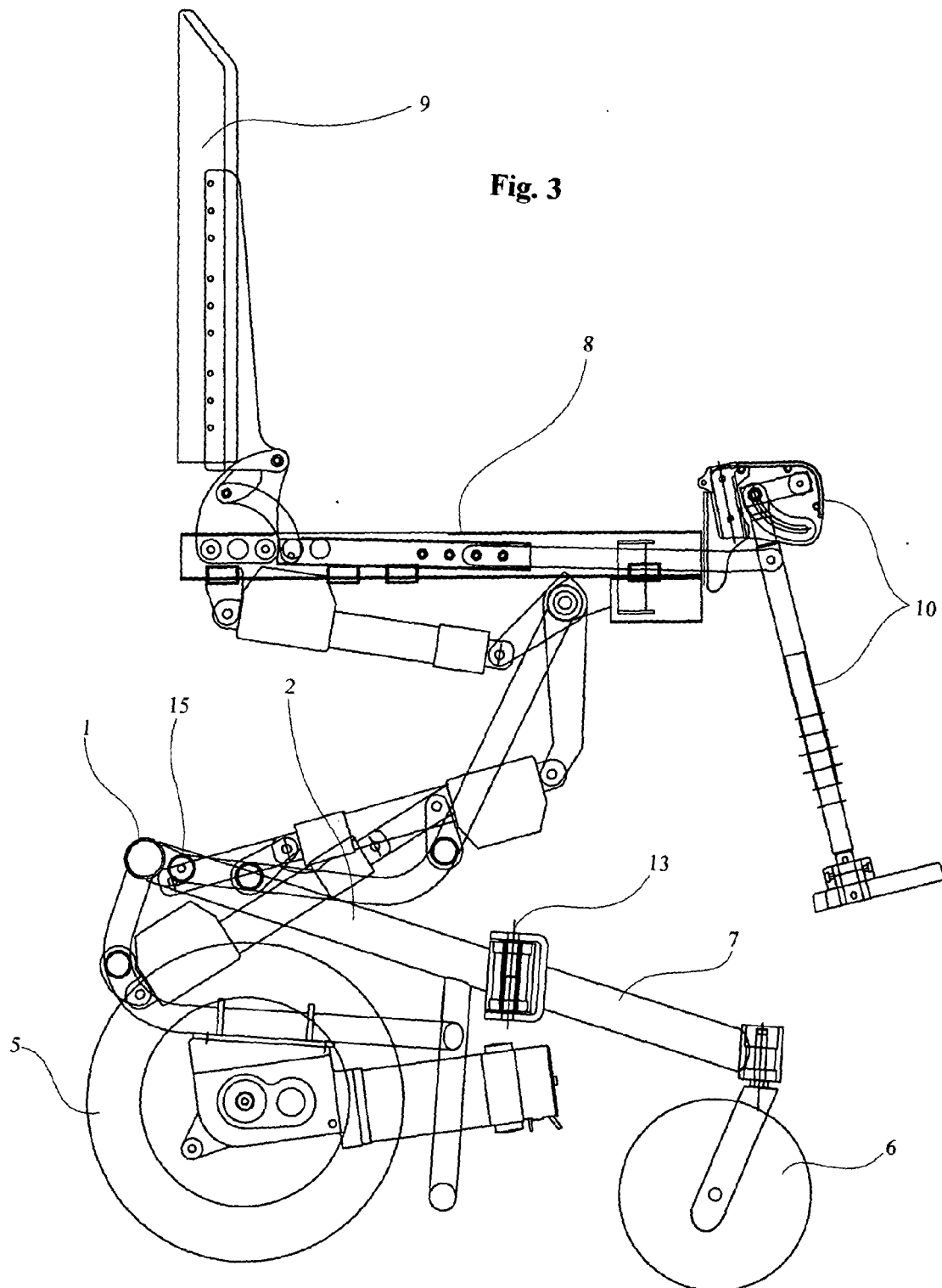


Fig. 4

