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(54) IRON RACK USED FOR STAND ASSIST RECLINER AND OPERATING METHOD THEREFOR

(57) An iron rack used for a stand assist recliner and an operating method therefor, wherein the iron rack used for a stand assist recliner comprises an inclined bracket (5), a base rack (6), an extending bracket (1), a rotating bar (2), an upper rack assembly and a first electric push bar (24); two sides of a middle part of the inclined bracket (5) are hinged with and cooperate with the base rack (6) such that a tail end of the inclined bracket (5) overlaps a tail end of the base rack (6); a front end of the base rack (6) overlaps at a front end of the inclined bracket (5); a tail end of the upper rack assembly is hinged with and cooperates with the tail end of the base rack (6); the rotating bar (2) is disposed above a front end of the upper rack assembly, and two ends of the rotating bar (2) drive and cooperate with the extending bracket (1); a front end of the upper rack assembly is provided with a stand assist stop block (83), and a lower side of an end part of the rotating bar (2) is provided with a stand assist bracket (23) that fits the stand assist stop block (83); a tail part of the upper rack assembly is further provided with a rotating bar limiting stop block (81); a front end of the first electric push bar (24) is hinged with and cooperates with a middle part of the rotating bar (2), and a tail end of the first electric push bar (24) is hinged with and cooperates with the tail end of the inclined bracket (5) so that the first electric push bar (24) is obliquely arranged between the rotating bar (2) and the inclined bracket (5).

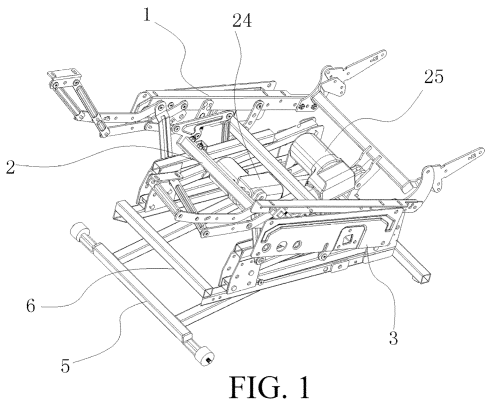

FIG. 1

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Description

TECHNICAL FIELD

[0001] The present invention relates to the technical field of sofa accessories, and in particular, to an iron frame for a stand-assisting recliner and an operating method therefor.

BACKGROUND

[0002] Recliners are essential furniture in many homes. With the continuous improvement of people's living standards, electric sofa recliners gradually enter ordinary people's homes. An electric sofa recliner is an electric sofa with an automatically adjustable backrest. The covering is usually made of high-quality genuine cowhide. The padding is high-grade sponge. The body structure is supported by a retractable recliner iron frame. The electric sofa recliner is fashionable and beautiful and is widely applied to homes, companies, among other places. Electric sofa recliners are a new chapter in the leisure industry and furniture industry. An electric sofa recliner can ingeniously integrate the practicability of furniture, the leisure aspect, and a high-tech, automated design.

[0003] An existing iron frame for a recliner usually has a lying-flat position, a crossed-leg position, an upright sitting position, and the like. Many iron frames for a recliner, for example, those disclosed in Chinese Patent (Granted) Publications No. CN202892335U, No. CN203538831U, and No. CN203314481U have the foregoing functions. The iron frames for a recliner disclosed in the foregoing patent documents do not have a stand-assisting function. It is very inconvenient for some elderly and disabled people to use such iron frames for a recliner. To overcome the foregoing disadvantages, Chinese Patent (Granted) Publication No. CN203986974U discloses a dual-motor drive mechanism for a recliner, including a base, a first drive head, a second drive head, a tail adjustment support assembly, and a middle adjustment support assembly being disposed on the base. The first drive head drives the tail adjustment support assembly to enable the tail adjustment support assembly to enter an erect state, a lying-flat state or an inclined state. The middle adjustment support assembly is correspondingly connected to a front adjustment linkage portion. The second drive head drives the middle adjustment support assembly to raise or lower to enable the middle adjustment support assembly to enter an erect state or a lying-flat state, and drives the front adjustment linkage portion to enable the front adjustment linkage portion to enter an unfolded state or a retracted state. In the retracted state, the front adjustment linkage portion is locked by the tail adjustment support assembly, and in the unfolded state, the front adjustment linkage portion is released by the tail adjustment support assembly. The dual-motor drive mechanism for a recliner can implement various functions of extending and retracting a recliner footrest, raising and lowering the recliner frame, tilting and erecting a backrest, and the like. Some special users need to lie on a recliner with the feet higher than the head to enable blood in the feet to quickly flow to the head or achieve other corresponding objectives. Existing recliner structures cannot implement the foregoing functions.

SUMMARY

[0004] The technical problem to be resolved in the present invention is to provide an iron frame for a stand-assisting recliner that has a simple structure and can implement the function of keeping the feet higher than the head and an operating method therefor.

[0005] To resolve the foregoing technical problem, the present invention provides an iron frame for a stand-assisting recliner, including: an inclined support, a base frame, a telescopic support, a rotating rod, an upper frame assembly, and a first electric push rod, where two sides of a middle portion of the inclined support are correspondingly hinged to the base frame, so that a tail end of the inclined support is propped on a tail end of the base frame, and a front end of the base frame is propped on a front end of the inclined support; a tail end of the upper frame assembly is correspondingly hinged to the tail end of the base frame, the rotating rod is disposed above a front portion of the upper frame assembly, two ends of the rotating rod are in transmission fit with the telescopic support, a stand-assisting stop block is disposed at a front end of the upper frame assembly, a stand-assisting support fitting the stand-assisting stop block is disposed on a lower side of an end portion of the rotating rod, a rotating rod limit block is further disposed at a tail portion of the upper frame assembly, a front end of the first electric push rod is correspondingly hinged to a middle portion of the rotating rod, and a tail end of the first electric push rod is correspondingly hinged to the tail end of the inclined support, so that the first electric push rod is obliquely disposed between the rotating rod and the inclined support; during assembly, the first electric push rod is in an initial state, a telescopic footrest assembly is in a retracted state, and the inclined support and the base frame are horizontally disposed; when the first electric push rod retracts, the rotating rod moves toward the rotating rod limit block, and the rotating rod drives the telescopic footrest assembly to unfold to form a lying-flat state; when the rotating rod moves to touch the rotating rod limit block, the telescopic footrest assembly no longer extends, and if the first electric push rod continues to retract, the first electric push rod pulls the tail end of the inclined support to rise, so that the front end of the inclined support forms a support, and the front end of the base frame rises to form a raised lying position state; and when the first electric push rod extends, the inclined support and the telescopic footrest assembly are reset, the first electric push rod continues to extend upward obliquely to enable the stand-assisting support to touch the stand-

assisting stop block, and the stand-assisting support drives the upper frame assembly to rotate around a tail end of the stand-assisting support to form a stand-assisting position.

[0006] Further, the upper frame assembly includes an H-shaped support, an inclined linkage, and a stand-assisting linkage, base frame upright braces are fixedly disposed on two sides of the tail end of the base frame, the H-shaped support includes an H-shaped support cross brace and an H-shaped support side brace fixedly disposed at two ends of the H-shaped support cross brace, a tail end of the H-shaped support side brace is correspondingly hinged to the bottom of the base frame upright brace, a stand-assisting upright brace is fixedly disposed at a tail end of each stand-assisting linkage, a front end of the H-shaped support side brace is correspondingly hinged to the bottom of the stand-assisting upright brace, a tail end of each inclined linkage is correspondingly hinged to a top end of the corresponding base frame upright brace, and a front end of the inclined linkage is correspondingly hinged to a middle portion of the stand-assisting upright brace, so that the H-shaped support side brace, the stand-assisting upright brace, the inclined linkage, and the base frame upright brace form a quadrilateral structure.

[0007] Further, the telescopic support includes two side braces that are symmetrically disposed, a telescopic footrest assembly is disposed at a front end of each side brace, a telescopic backrest assembly is disposed at a tail end of each side brace, a side brace drive assembly is disposed at a middle portion of each side brace, a support linkage is further disposed at the front end of each side brace, a top end of the support linkage is correspondingly hinged to the side brace, a bottom end of the support linkage is correspondingly hinged to the stand-assisting upright brace, rotating linkages are fixedly disposed at the two ends of the rotating rod respectively, a fixed linkage is fixedly disposed on an inner side of each side brace, the rotating linkage includes a front connecting end, a rear connecting end, and a rotating connecting end that are distributed in a triangular shape, the rotating connecting end is correspondingly hinged to the bottom of the fixed linkage, and the front connecting end is in transmission fit with the telescopic footrest assembly, so that the front connecting end is capable of driving the telescopic footrest assembly to extend or retract during the rotation of the rotating rod.

[0008] Further, the iron frame for a stand-assisting recliner further includes an armrest support, where the armrest support includes an armrest support cross brace and an armrest support side brace fixedly disposed at two ends of the armrest support cross brace, an armrest linkage is disposed on an inner side of a front portion of the armrest support side brace, one end of the armrest linkage is correspondingly hinged to the armrest support side brace, the other end is correspondingly hinged to an outer side of the side brace, the two ends of the armrest support cross brace are disposed below the middle portion of the side brace, the two ends of the armrest support cross brace are fixedly connected to the stand-assisting linkage, the armrest support cross brace is in transmission fit with the side brace drive assembly, and the side brace drive assembly is in transmission fit with the rear connecting end of the rotating linkage, so that the rear connecting end is capable of driving the side brace drive assembly to move during the rotation of the rotating rod.

[0009] Further, the side brace drive assembly includes a first linkage and a second linkage that are distributed in an inverted A shape, push linkages are fixedly disposed at the two ends of the armrest support cross brace, a top end of the first linkage is correspondingly hinged to the side brace, a tail end of the first linkage is correspondingly hinged to a bottom end of the second linkage, a top end of the second linkage is correspondingly hinged to the rear connecting end, and a middle portion of the first linkage is correspondingly hinged to a tail end of the push linkage, so that the rotating rod is capable of driving the side brace drive assembly and the telescopic support to move.

[0010] Further, the telescopic footrest assembly includes a footrest first linkage and a footrest second linkage that are disposed in parallel, a footrest third linkage and a footrest fourth linkage that are disposed in parallel, a footrest front brace, and a footrest transmission bar, tail ends of the footrest first linkage and the footrest second linkage are correspondingly hinged to a front end of the side brace, a tail end of the footrest third linkage is correspondingly hinged to a front end of the footrest first linkage, a tail end of the footrest fourth linkage is correspondingly hinged to a front end of the footrest second linkage, front ends of the footrest third linkage and the footrest fourth linkage are correspondingly hinged to the footrest front brace, a footrest rotating pin is disposed at the middle portion of the footrest first linkage, a middle portion of the footrest fourth linkage is correspondingly hinged to the footrest rotating pin, a tail end of the footrest transmission linkage is correspondingly hinged to the front connecting end of the rotating linkage, and a front end of the footrest transmission linkage is correspondingly hinged to a middle portion of the footrest second linkage, so that the rotating linkage is capable of driving the footrest transmission linkage and the footrest rotating pin to move, and the transformation and expansion of the footrest first linkage, the footrest second linkage, the footrest third linkage, and the footrest fourth linkage are implemented.

[0011] Further, the telescopic backrest assembly includes a backrest first linkage, a backrest second linkage, and a backrest third linkage, a bottom end of the backrest first linkage is fixedly connected to a tail end of the side brace, a top end of the backrest first linkage is correspondingly hinged to a front end of the backrest second linkage, a rear end of the backrest second linkage is correspondingly hinged to a top end of the backrest third linkage, a backrest cross brace is fixedly disposed between two backrest third linkages, and when moving, the

backrest cross brace is capable of driving the backrest first linkage, the backrest second linkage, and the backrest third linkage to extend or retract.

[0012] Further, the iron frame for a stand-assisting recliner further includes a second electric push rod, where a front end of the second electric push rod is correspondingly hinged to the middle portion of the rotating rod, and a tail end of the second electric push rod is correspondingly hinged to a middle portion of the backrest cross brace, so that the second electric push rod is capable of driving the telescopic backrest assembly to extend or retract.

[0013] Further, cushion blocks are disposed on two sides of the tail end of the base frame and two sides of the front end of the base frame, and castors are disposed on two sides of the front end of the inclined support.

[0014] An operating method for the foregoing iron frame for a stand-assisting recliner includes the following steps:

A. an upright sitting position: the first electric push rod is in an initial state, the inclined support and the base frame are in a horizontal state, and the telescopic footrest assembly is in a retracted state, so that upright sitting is implemented;

B. a lying-flat position: the first electric push rod is started to enable the first electric push rod to retract, the first electric push rod retracts to drive the rotating rod to move toward the rotating rod limit block, the rotating rod drives the rotating linkage to rotate, the rotating linkage drives the telescopic footrest assembly to unfold to form a lying-flat state, and when the rotating rod moves to touch the rotating rod limit block, the telescopic footrest assembly no longer extends;

C. a raised lying position: the first electric push rod continues to retract, the rotating rod limit block enables that the rotating rod is prevented from moving on, and the first electric push rod pulls the tail end of the inclined support to rise, so that the front end of the inclined support forms a support, and the front end of the base frame rises to form a raised lying position state; and

D. a stand-assisting position: when the first electric push rod extends, the inclined support and the telescopic footrest assembly are reset, the first electric push rod continues to extend upward obliquely to enable the stand-assisting support to touch the stand-assisting stop block, and the stand-assisting support drives the upper frame assembly to rotate around a tail end of the stand-assisting support to form a stand-assisting position.

[0015] The technical effects of the present invention are as follows: (1) Compared with the prior art, in the iron frame for a stand-assisting recliner of the present invention, the inclined support is disposed, so that after being unfolded, the telescopic support is driven by the first electric push rod to implement the elevation of the front end of the base frame, so that when a user lies down, the function of keeping the feet higher than the head can be implemented, providing the iron frame with more functions. (2) The castors are disposed to implement slidable fit between the front end of the inclined support and the floor, to reduce frictional resistance. (3) The rotating linkage is provided with three connecting ends, so that three operation modes, namely, a lying-flat position, a leisure lying position, and a stand-assisting position can be implemented with only one electric push rod, and has a simple structure and varied functions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The following further describes the present invention in detail with reference to the accompanying drawings in this specification.

FIG. 1 is a schematic three-dimensional structural diagram of an iron frame for a stand-assisting recliner according to the present invention.

FIG. 2 is a schematic structural diagram of an iron frame for a stand-assisting recliner being in a sitting position state according to the present invention.

FIG. 3 is a schematic structural diagram of an iron frame for a stand-assisting recliner being in a lying-flat state according to the present invention.

FIG. 4 is a schematic structural diagram of an iron frame for a stand-assisting recliner being in a raised lying position state according to the present invention.

FIG. 5 is a schematic structural diagram of an iron frame for a stand-assisting recliner being in a stand-assisting state according to the present invention.

FIG. 6 is a schematic structural exploded view of an iron frame for a stand-assisting recliner according to the present invention.

FIG. 7 is a schematic three-dimensional structural diagram of a telescopic support and a rotating rod.

FIG. 8 is a side view of the telescopic support.

FIG. 9 is a schematic structural assembled view of an H-shaped support, an inclined support, a base frame, an inclined linkage, and a stand-assisting linkage.

FIG. 10 is a schematic structural exploded view of an H-shaped support, an inclined support, a base frame, an inclined linkage, and a stand-assisting linkage.

[0017] In the figures:

telescopic support 1, side brace 11,
backrest first linkage 121, backrest second linkage 122, backrest third linkage 123, backrest cross brace 124, backrest connecting support 125,
rotating linkage 13, rotating connecting end 131, front connecting end 132, rear connecting end 133,

first linkage 141, second linkage 142,
fixed linkage 15, support linkage 16, armrest linkage 17,
footrest first linkage 181, footrest second linkage 182, footrest third linkage 183, footrest fourth linkage 184, footrest front brace 185, footrest rotating pin 186, footrest transmission bar 187,
rotating rod 2, first connecting frame 21, second connecting frame 22, stand-assisting support 23, first electric push rod 24, second electric push rod 25,
armrest support 3, armrest support cross brace 31, armrest support side brace 32, push linkage 33,
H-shaped support 4, H-shaped support cross brace 41, H-shaped support side brace 42,
inclined support 5, inclined support front brace 51, inclined support rear brace 52, inclined support side brace 53, hinged support 54, castor 55, limit block 56, and
base frame 6, base frame front brace 61, base frame rear brace 62, base frame side brace 63, base frame upright brace 64, cushion block 65, inclined linkage 7, stand-assisting linkage 8, rotating rod limit block 81, stand-assisting upright brace 82, and stand-assisting stop block 83.

DETAILED DESCRIPTION

Embodiment 1

[0018] As shown in FIGS. 1 and 6, an iron frame for a stand-assisting recliner in this embodiment includes an inclined support 5, a base frame 6, a telescopic support 1, a rotating rod 2, an upper frame assembly, a first electric push rod 24, a second push rod 25, and an armrest support 3.

[0019] As shown in FIGS. 9 and 10, the base frame 6 includes a base frame front brace 61, a base frame rear brace 62, and two base frame side braces 63 arranged on two sides. Two ends of the base frame front brace 61 are welded and fixed to front ends of the two base frame side braces 63 respectively. Two ends of the base frame rear brace 62 are welded and fixed to rear portions of the two base frame side braces 63 to form a rectangular base frame framework. Cushion blocks 65 are disposed at the two ends of the base frame rear brace 62 and the two ends of the base frame front brace 61 respectively, so that the base frame 6 can touch the floor by the cushion blocks 65. Base frame upright braces 64 extending upward are disposed at the rear portions of the two base frame side braces 63 respectively.

[0020] As shown in FIGS. 9 and 10, the inclined support 5 includes an inclined support front brace 51, an inclined support rear brace 52, and two inclined support side braces 53 disposed on two sides. Two ends of the inclined support front brace 51 are welded and fixed to front ends of the two inclined support side braces 53 respectively. Two ends of the inclined support rear brace 52 are welded and fixed to rear portions of the two inclined support side braces 53 to form a rectangular inclined support framework. Castors 55 are disposed at the two ends of the inclined support front brace 51. Outer sides of middle portions of the inclined support side braces 53 are correspondingly hinged to middle portions of inner sides of the base frame side braces 63 respectively, and limit blocks 56 are disposed protruding from the two ends of the inclined support rear brace 52, so that the limit block 56 at a tail end of the inclined support 5 is propped on the base frame rear brace 62 at a tail end of the base frame 6, and the base frame front brace 61 at a front end of the base frame 6 is propped on a front portion of the inclined support side brace 53 of the inclined support 5. A hinged support 54 is disposed in a middle portion of the inclined support rear brace 52.

[0021] As shown in FIGS. 9 and 10, the upper frame assembly includes an H-shaped support 4, a pair of inclined linkages 7, and a pair of stand-assisting linkages 8. The H-shaped support 4 includes an H-shaped support cross brace 41 and H-shaped support side braces 42 fixedly disposed at two ends of the H-shaped support cross brace 41. Tail ends of the H-shaped support side braces 42 are correspondingly hinged to the bottoms of the corresponding base frame upright braces 64 respectively. A stand-assisting upright brace 82 is fixedly disposed at a tail end of each stand-assisting linkage 8. A front end of the H-shaped support side brace 42 is correspondingly hinged to the bottom of the stand-assisting upright brace 82, a tail end of each inclined linkage 7 is correspondingly hinged to a top end of the corresponding base frame upright brace 64, and a front end of the inclined linkage 7 is correspondingly hinged to a middle portion of the stand-assisting upright brace 82, so that the H-shaped support side brace 42, the stand-assisting upright brace 82, the inclined linkage 7, and the base frame upright brace 64 form a quadrilateral structure.

[0022] As shown in FIGS. 7 and 8, the telescopic support 1 includes two side braces 11 that are symmetrically disposed. A telescopic footrest assembly is disposed at a front end of each side brace 11, a telescopic backrest assembly is disposed at a tail end of each side brace 11, and a side brace drive assembly is disposed at a middle portion of each side brace 11. The rotating rod 2 is disposed on an upper side of a front portion of the stand-assisting linkage 8, rotating linkages 13 are fixedly disposed at two ends of the rotating rod 2 respectively, and a fixed linkage 15 is fixedly disposed on an inner side of each side brace 11. The rotating linkage 13 includes a front connecting end 132, a rear connecting end 133, and a rotating connecting end 131 that are distributed in a triangular shape. The rotating connecting end 131 is correspondingly hinged to the bottom of the corresponding fixed linkage 13. A support linkage 16 is further disposed at the front end of each side brace 11. A top end of the support linkage 16 is correspondingly hinged to the side brace 11, and a bottom end of the support linkage 16 is correspondingly hinged to the stand-assisting upright brace 82.

[0023] A telescopic footrest assembly includes a footrest first linkage 181 and a footrest second linkage 182 that are disposed in parallel, a footrest third linkage 183 and a footrest fourth linkage 184 that are disposed in parallel, a footrest front brace 185, and a footrest transmission bar 187. Tail ends of the footrest first linkage 181 and the footrest second linkage 182 are correspondingly hinged to a front end of the side brace 11, a tail end of the footrest third linkage 183 is correspondingly hinged to a front end of the footrest first linkage 181, a tail end of the footrest fourth linkage 184 is correspondingly hinged to a front end of the footrest second linkage 182, and front ends of the footrest third linkage 183 and the footrest fourth linkage 184 are correspondingly hinged to the footrest front brace 185. A footrest rotating pin 186 is disposed at the middle portion of the footrest first linkage 181. A middle portion of the footrest fourth linkage 184 is correspondingly hinged to the footrest rotating pin 186, a tail end of the footrest transmission linkage 187 is correspondingly hinged to the front connecting end 132 of the rotating linkage 13, and a front end of the footrest transmission linkage 187 is correspondingly hinged to a middle portion of the footrest second linkage 182, so that the rotating rod 2 and the rotating linkage 13 are capable of driving the footrest transmission linkage 187 and the footrest rotating pin 186 to move, and the transformation and expansion of the footrest first linkage 181, the footrest second linkage 182, the footrest third linkage 183, and the footrest fourth linkage 184 are implemented.

[0024] As shown in FIG. 6, the iron frame for a stand-assisting recliner further includes an armrest support 3. The armrest support 3 includes an armrest support cross brace 31 and an armrest support side brace 32 fixedly disposed at two ends of the armrest support cross brace 31, and an armrest linkage 17 is disposed on an inner side of a front portion of the armrest support side brace 32. One end of the armrest linkage 17 is correspondingly hinged to the armrest support side brace 32, and the other end is correspondingly hinged to an outer side of the side brace 11. The two ends of the armrest support cross brace 31 are disposed below the middle portion of the side brace 11, the two ends of the armrest support cross brace 31 are welded and fixed to the stand-assisting linkage 8, and push linkages 33 are fixedly disposed at the two ends of the armrest support cross brace 31. The side brace drive assembly includes a first linkage 141 and a second linkage 142 that are distributed in an inverted A shape. A top end of the first linkage 141 is correspondingly hinged to the side brace 11, a tail end of the first linkage 141 is correspondingly hinged to a bottom end of the second linkage 142, a top end of the second linkage 142 is correspondingly hinged to the rear connecting end 133, and a middle portion of the first linkage 141 is correspondingly hinged to a bottom end of the push linkage 33. The armrest support cross brace 31 is disposed between the push linkage 33 and the first linkage 141, to enable the rotating linkage 13 to drive the second linkage 142 to move, so that the rotating rod 2 drives the side brace drive assembly and the telescopic support 1 to move.

[0025] A first connecting frame 21 and a second connecting frame 22 are disposed at the middle portion of the rotating rod 2. A front end of the first electric push rod 24 is correspondingly hinged to the first connecting frame 21, and a tail end of the first electric push rod 24 is correspondingly hinged to the hinged support 54 on the inclined support rear brace 52, so that the first electric push rod is obliquely disposed between the rotating rod and the inclined support. A stand-assisting stop block 83 is disposed on an inner side of the stand-assisting upright brace 82, a stand-assisting support 23 fitting the stand-assisting stop block 83 is disposed on a lower side of an end portion of the rotating rod 2, a rotating rod limit block 81 is further disposed at a tail portion of the stand-assisting linkage 8, and the rotating rod is limited by the stand-assisting stop block 83 and the rotating rod limit block 81.

[0026] The telescopic backrest assembly includes a backrest first linkage 121, a backrest second linkage 122, and a backrest third linkage 123. A bottom end of the backrest first linkage 121 is fixedly connected to a tail end of the side brace 11. A top end of the backrest first linkage 121 is correspondingly hinged to a front end of the backrest second linkage 122, and a rear end of the backrest second linkage 122 is correspondingly hinged to a top end of the backrest third linkage 123. A backrest cross brace 124 is fixedly disposed between two backrest third linkages 123, and a backrest connecting support 125 is disposed at a middle portion of the backrest cross brace 124. A front end of the second electric push rod 25 is correspondingly hinged to the second connecting frame 22, and a tail end of the second electric push rod 25 is correspondingly hinged to the backrest connecting support 125 at the middle portion of the backrest cross brace 124, so that the second electric push rod extends or retracts to drive the telescopic backrest assembly to extend or retract.

[0027] During assembly, the first electric push rod 24 is in an initial state, the telescopic footrest assembly is in a retracted state, and the inclined support 5 and the base frame 6 are horizontally disposed. When the first electric push rod 24 retracts, the rotating rod 2 moves toward the rotating rod limit block 81, and the rotating rod 2 drives the telescopic footrest assembly to unfold to form a lying-flat state. When the rotating rod 2 moves to touch the rotating rod limit block 81, the telescopic footrest assembly no longer extends. If the first electric push rod 24 continues to retract, the first electric push rod 24 pulls the tail end of the inclined support 5 to rise, so that the front end of the inclined support 5 forms a support, and the front end of the base frame 6 rises to form a raised lying position state. When the first electric push rod 24 extends, the inclined support 5 and the telescopic footrest assembly are reset, the first electric push rod 24 continues to extend upward obliquely to enable the stand-assisting support 23 to touch the stand-assisting stop block 83, and the stand-assisting support 23 drives the upper

frame assembly to rotate around a tail end of the stand-assisting support to form a stand-assisting position.

Embodiment 2

[0028] An operating method for the foregoing iron frame for a stand-assisting recliner includes the following steps:

A. an upright sitting position: the first electric push rod 24 is in an initial state, the inclined support 5 and the base frame 6 are in a horizontal state, and the telescopic footrest assembly is in a retracted state, so that upright sitting is implemented, as shown in FIG. 2;
B. a lying-flat position: the first electric push rod 24 is started to enable the first electric push rod 24 to retract, the first electric push rod 24 retracts to drive the rotating rod 2 to move toward the rotating rod limit block 81, the rotating rod 2 drives the rotating linkage 13 to rotate, the rotating linkage 13 drives the telescopic footrest assembly to unfold to form a lying-flat state, and when the rotating rod 2 moves to touch the rotating rod limit block 81, the telescopic footrest assembly no longer extends;
C. a raised lying position: the first electric push rod 24 continues to retract, the rotating rod limit block 81 enables that the rotating rod 2 is prevented from moving on, and the first electric push rod 24 pulls the tail end of the inclined support 5 to rise, so that the front end of the inclined support 5 forms a support, and the front end of the base frame 6 rises to form a raised lying position state; and
D. a stand-assisting position: when the first electric push rod 24 extends, the inclined support 5 and the telescopic footrest assembly are reset, the first electric push rod 24 continues to extend upward obliquely to enable the stand-assisting support 23 to touch the stand-assisting stop block 83 on the stand-assisting upright brace 82, the stand-assisting support 23 drives the inclined linkage 7 in the upper frame assembly and the H-shaped support 4 to rotate upward around the bottom of the base frame upright brace 64, and the rotating linkage 13 pulls the first linkage 141 and the second linkage 142 to move, to drive the armrest support 3, the side brace 11, and the stand-assisting linkage 8 to move, so that the tail end of the armrest support 3 rises, the side brace 11 rotates around the support linkage 16, the backrest assembly rises, and the stand-assisting linkage 8 rises to form a stand-assisting position.

[0029] Obviously, the foregoing embodiments are merely examples for describing the present invention clearly, and are not intended to limit the embodiments of the present invention. A person of ordinary skill in the art may further make other various forms of changes or variations on the basis of the foregoing description. It is neither necessary nor possible to exhaust all the embodiments herein. These obvious changes or variations derived from the spirit of the present invention still fall within the protection scope of the present invention.

Claims

1. An iron frame for a stand-assisting recliner, comprising an inclined support, a base frame, a telescopic support, a rotating rod, an upper frame assembly, and a first electric push rod, wherein two sides of a middle portion of the inclined support are correspondingly hinged to the base frame, so that a tail end of the inclined support is propped on a tail end of the base frame, and a front end of the base frame is propped on a front end of the inclined support; and a tail end of the upper frame assembly is correspondingly hinged to the tail end of the base frame, the rotating rod is disposed above a front portion of the upper frame assembly, two ends of the rotating rod are in transmission fit with the telescopic support, a stand-assisting stop block is disposed at a front end of the upper frame assembly, a stand-assisting support fitting the stand-assisting stop block is disposed on a lower side of an end portion of the rotating rod, a rotating rod limit block is further disposed at a tail portion of the upper frame assembly, a front end of the first electric push rod is correspondingly hinged to a middle portion of the rotating rod, and a tail end of the first electric push rod is correspondingly hinged to the tail end of the inclined support, so that the first electric push rod is obliquely disposed between the rotating rod and the inclined support.

2. The iron frame for a stand-assisting recliner according to claim 1, wherein the upper frame assembly comprises an H-shaped support, an inclined linkage, and a stand-assisting linkage, base frame upright braces are fixedly disposed on two sides of the tail end of the base frame, the H-shaped support comprises an H-shaped support cross brace and an H-shaped support side brace fixedly disposed at two ends of the H-shaped support cross brace, and a tail end of the H-shaped support side brace is correspondingly hinged to the bottom of the base frame upright brace, a stand-assisting upright brace is fixedly disposed at a tail end of each stand-assisting linkage, a front end of the H-shaped support side brace is correspondingly hinged to the bottom of the stand-assisting upright brace, a tail end of each inclined linkage is correspondingly hinged to a top end of the corresponding base frame upright brace, and a front end of the inclined linkage is correspondingly hinged to a middle portion of the stand-assisting upright brace.

3. The iron frame for a stand-assisting recliner accord-

ing to claim 2, wherein the telescopic support comprises two side braces that are symmetrically disposed, a telescopic footrest assembly is disposed at a front end of each side brace, a telescopic backrest assembly is disposed at a tail end of each side brace, a side brace drive assembly is disposed at a middle portion of each side brace, a support linkage is further disposed at the front end of each side brace, a top end of the support linkage is correspondingly hinged to the side brace, and a bottom end of the support linkage is correspondingly hinged to the stand-assisting upright brace; and rotating linkages are fixedly disposed at the two ends of the rotating rod respectively, a fixed linkage is fixedly disposed on an inner side of each side brace, the rotating linkage comprises a front connecting end, a rear connecting end, and a rotating connecting end that are distributed in a triangular shape, the rotating connecting end is correspondingly hinged to the bottom of the fixed linkage, and the front connecting end is in transmission fit with a telescopic footrest assembly, so that the front connecting end is capable of driving the telescopic footrest assembly to extend or retract during the rotation of the rotating rod.

4. The iron frame for a stand-assisting recliner according to claim 3, further comprising an armrest support, wherein the armrest support comprises an armrest support cross brace and an armrest support side brace fixedly disposed at two ends of the armrest support cross brace, an armrest linkage is disposed on an inner side of a front portion of the armrest support side brace, one end of the armrest linkage is correspondingly hinged to the armrest support side brace, the other end is correspondingly hinged to an outer side of the side brace, the two ends of the armrest support cross brace are disposed below the middle portion of the side brace, the two ends of the armrest support cross brace are fixedly connected to the stand-assisting linkage, the armrest support cross brace is in transmission fit with the side brace drive assembly, and the side brace drive assembly is in transmission fit with the rear connecting end of the rotating linkage, so that the rear connecting end is capable of driving the side brace drive assembly to move during the rotation of the rotating rod.

5. The iron frame for a stand-assisting recliner according to claim 4, wherein the side brace drive assembly comprises a first linkage and a second linkage that are distributed in an inverted A shape, push linkages are fixedly disposed at the two ends of the armrest support cross brace, a top end of the first linkage is correspondingly hinged to the side brace, a tail end of the first linkage is correspondingly hinged to a bottom end of the second linkage, a top end of the second linkage is correspondingly hinged to the rear connecting end, and a middle portion of the first linkage is correspondingly hinged to a tail end of the push linkage, so that the rotating rod is capable of driving the side brace drive assembly and the telescopic support to move.

6. The iron frame for a stand-assisting recliner according to any one of claims 3 to 5, wherein the telescopic footrest assembly comprises a footrest first linkage and a footrest second linkage that are disposed in parallel, a footrest third linkage and a footrest fourth linkage that are disposed in parallel, a footrest front brace and a footrest transmission bar, tail ends of the footrest first linkage and the footrest second linkage are correspondingly hinged to a front end of the side brace, a tail end of the footrest third linkage is correspondingly hinged to a front end of the footrest first linkage, a tail end of the footrest fourth linkage is correspondingly hinged to a front end of the footrest second linkage, front ends of the footrest third linkage and the footrest fourth linkage are correspondingly hinged to the footrest front brace, a footrest rotating pin is disposed at the middle portion of the footrest first linkage, a middle portion of the footrest fourth linkage is correspondingly hinged to the footrest rotating pin, a tail end of the footrest transmission linkage is correspondingly hinged to the front connecting end of the rotating linkage, and a front end of the footrest transmission linkage is correspondingly hinged to a middle portion of the footrest second linkage, so that the rotating linkage is capable of driving the footrest transmission linkage and the footrest rotating pin to move.

7. The iron frame for a stand-assisting recliner according to claim 6, wherein the telescopic backrest assembly comprises a backrest first linkage, a backrest second linkage, and a backrest third linkage, a bottom end of the backrest first linkage is fixedly connected to a tail end of the side brace, a top end of the backrest first linkage is correspondingly hinged to a front end of the backrest second linkage, a rear end of the backrest second linkage is correspondingly hinged to a top end of the backrest third linkage, and a backrest cross brace is fixedly disposed between two backrest third linkages.

8. The iron frame for a stand-assisting recliner according to claim 7, further comprising a second electric push rod, wherein a front end of the second electric push rod is correspondingly hinged to the middle portion of the rotating rod, and a tail end of the second electric push rod is correspondingly hinged to a middle portion of the backrest cross brace.

9. The iron frame for a stand-assisting recliner according to claim 6, wherein cushion blocks are disposed on two sides of the tail end of the base frame and two sides of the front end of the base frame, and

castors are disposed on two sides of the front end of the inclined support.

10. An operating method for the iron frame for a stand-assisting recliner according to claim 6, comprising the following steps:

A. an upright sitting position: the first electric push rod is in an initial state, the inclined support and the base frame are in a horizontal state, and the telescopic footrest assembly is in a retracted state, so that upright sitting is implemented;
B. a lying-flat position: the first electric push rod is started to enable the first electric push rod to retract, the first electric push rod retracts to drive the rotating rod to move toward the rotating rod limit block, the rotating rod drives the rotating linkage to rotate, and the rotating linkage drives the telescopic footrest assembly to unfold to form a lying-flat state, and when the rotating rod moves to touch the rotating rod limit block, the telescopic footrest assembly no longer extends;
C. a raised lying position: the first electric push rod continues to retract, the rotating rod limit block enables that the rotating rod is prevented from moving on, and the first electric push rod pulls the tail end of the inclined support to rise, so that the front end of the inclined support forms a support, and the front end of the base frame rises to form a raised lying position state; and
D. a stand-assisting position: when the first electric push rod extends, the inclined support and the telescopic footrest assembly are reset, the first electric push rod continues to extend upward obliquely to enable the stand-assisting support to touch the stand-assisting stop block, and the stand-assisting support drives the upper frame assembly to rotate around a tail end of the stand-assisting support to form a stand-assisting position.

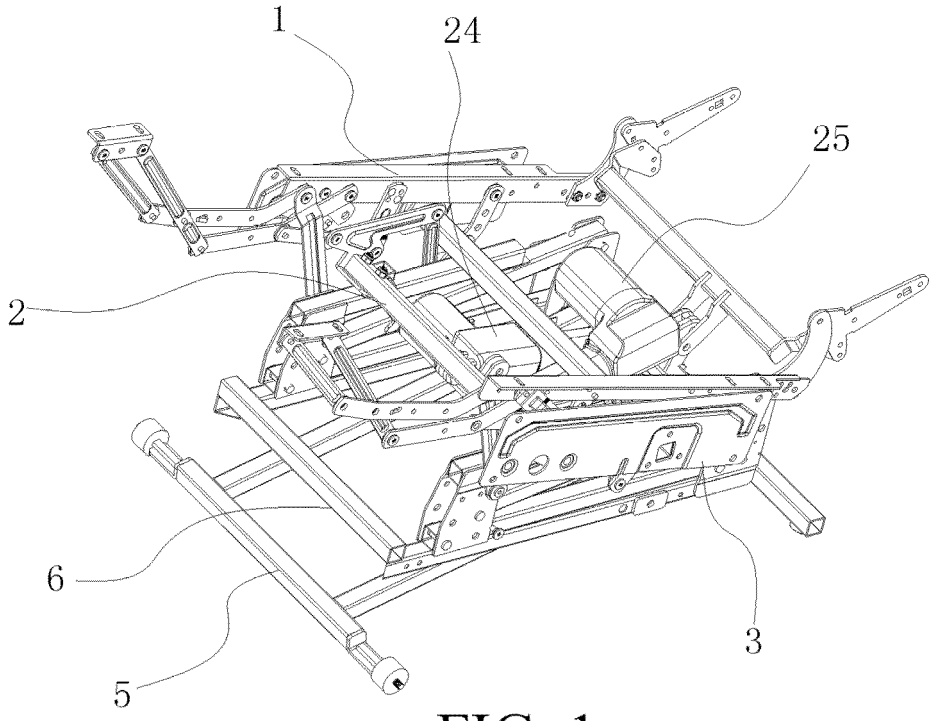

FIG. 1

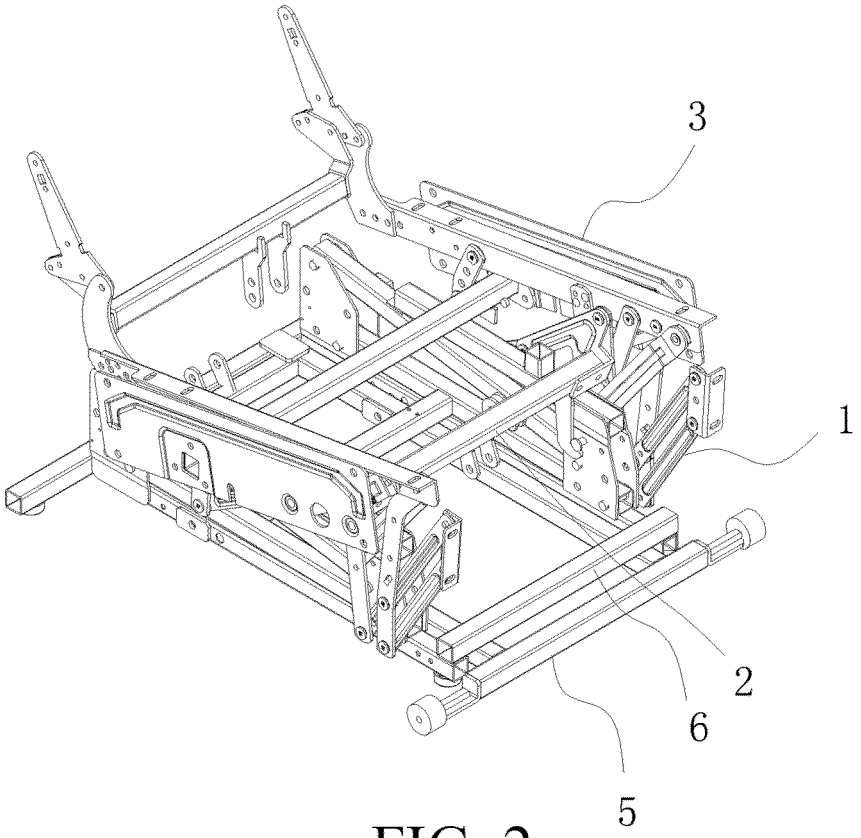

FIG. 2

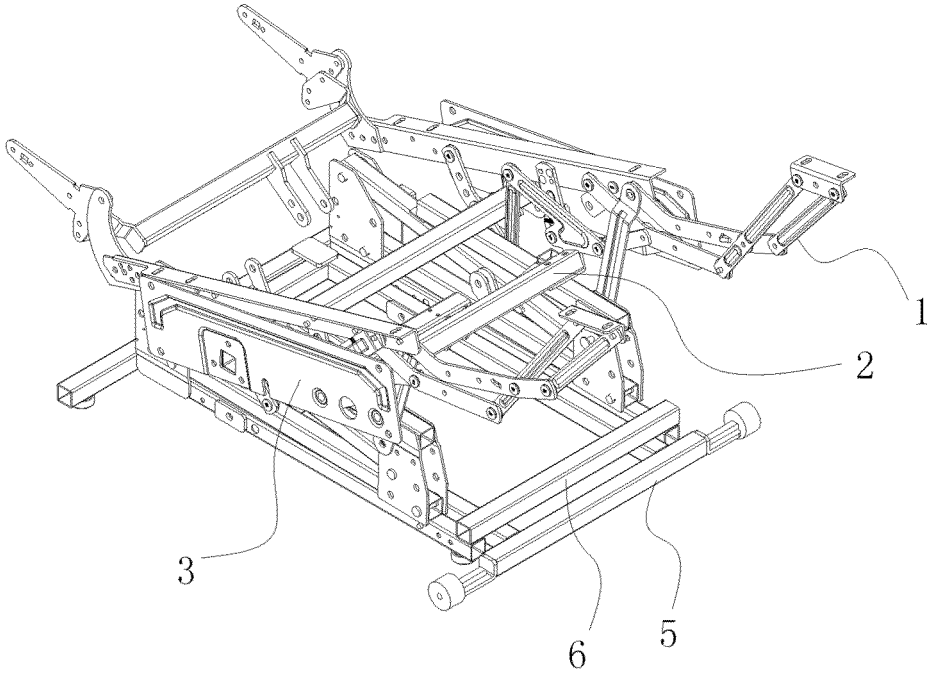

FIG. 3

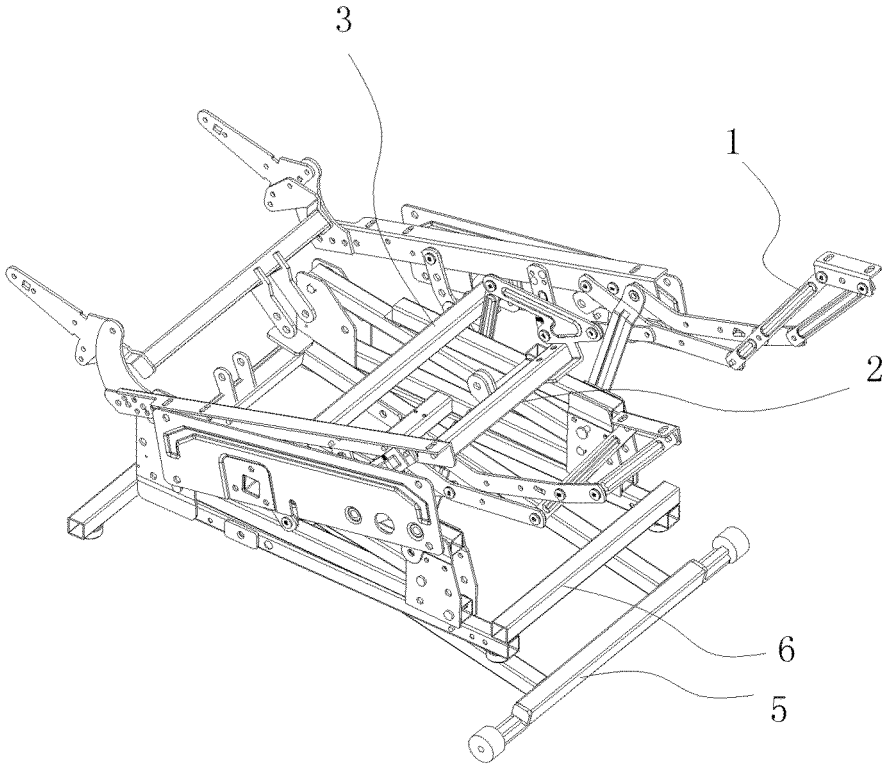

FIG. 4

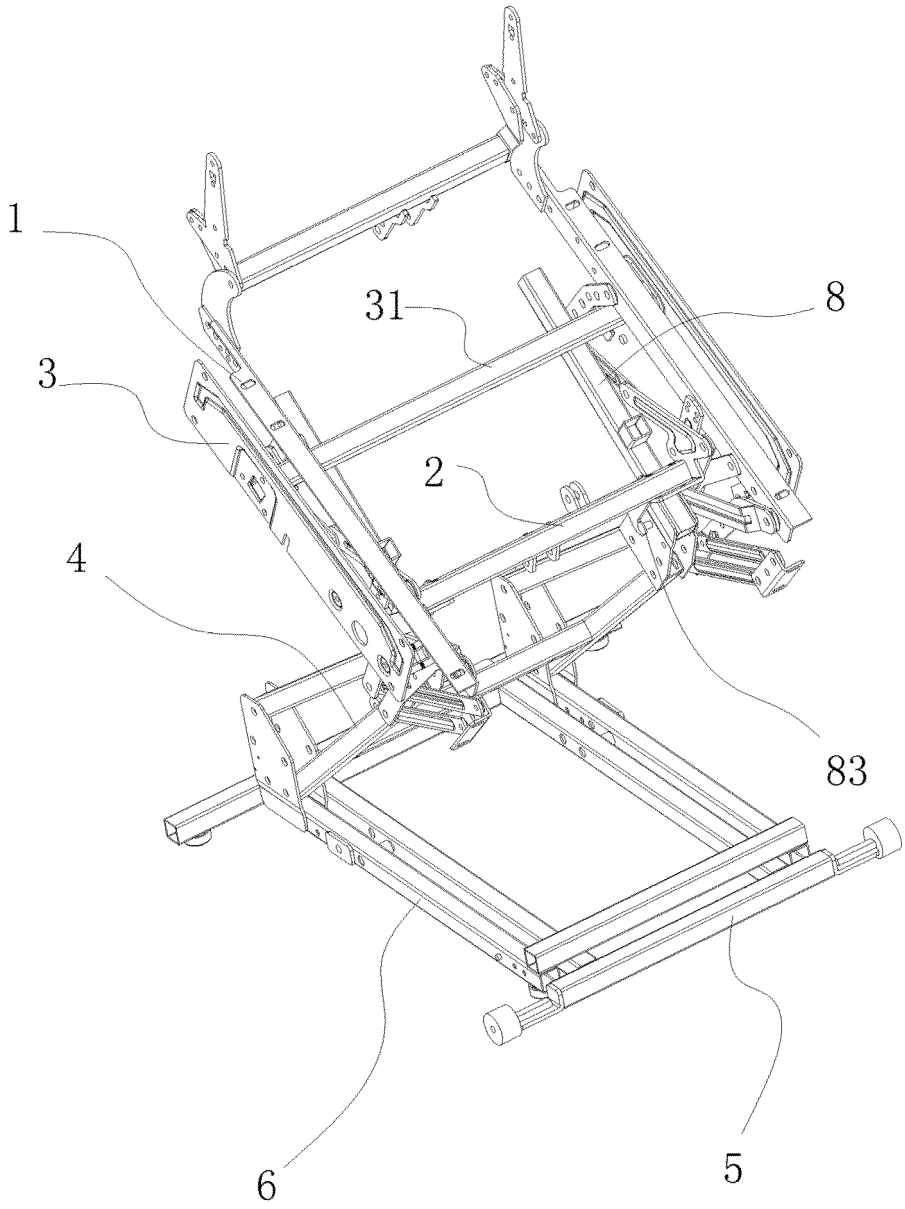

FIG. 5

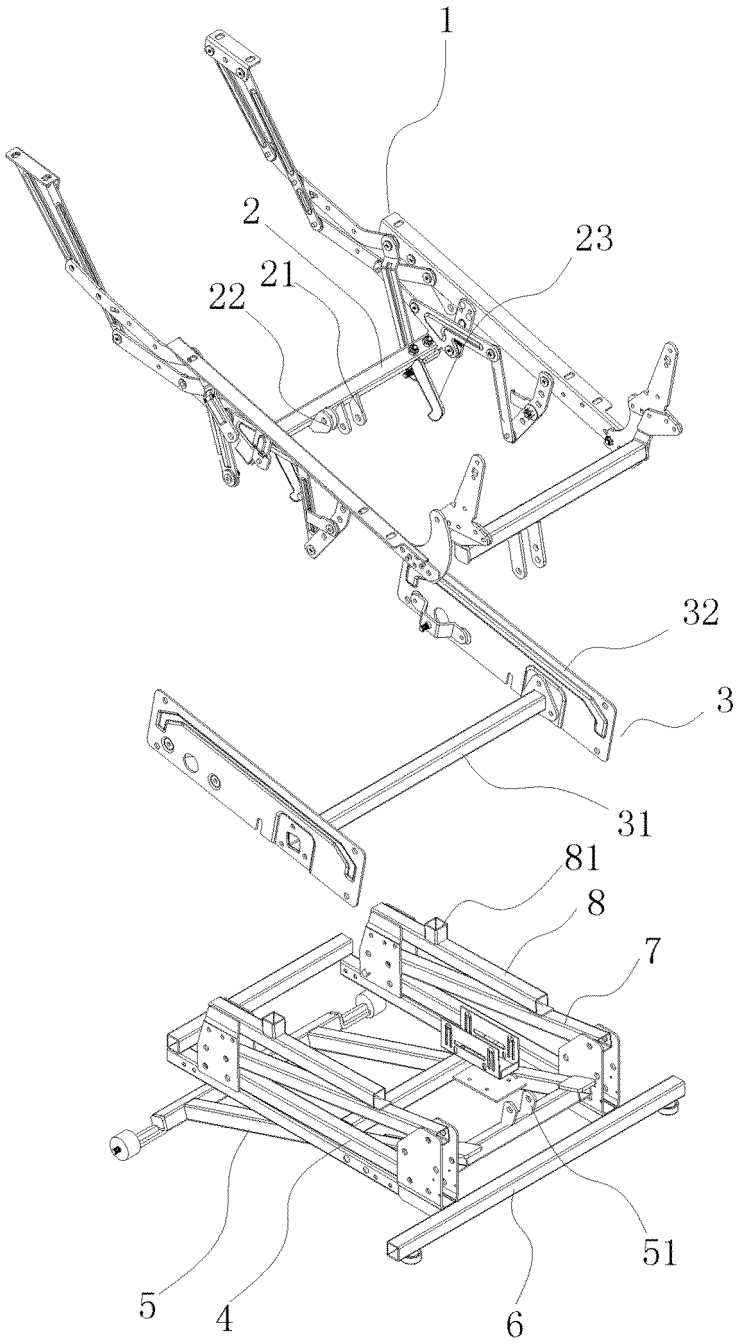

FIG. 6

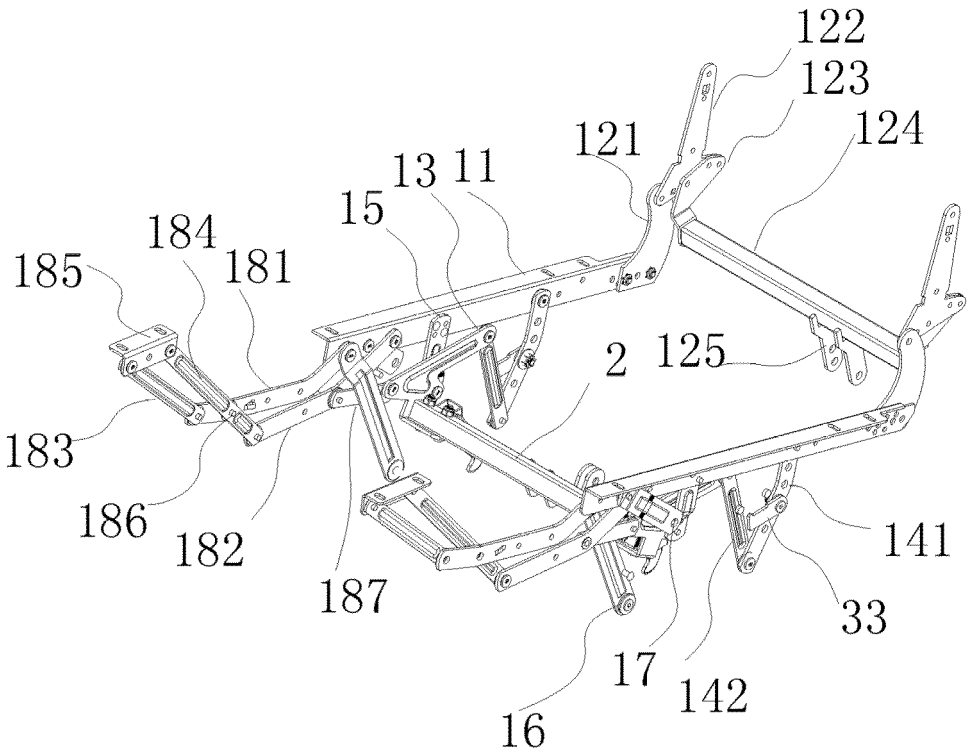
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FIG. 7

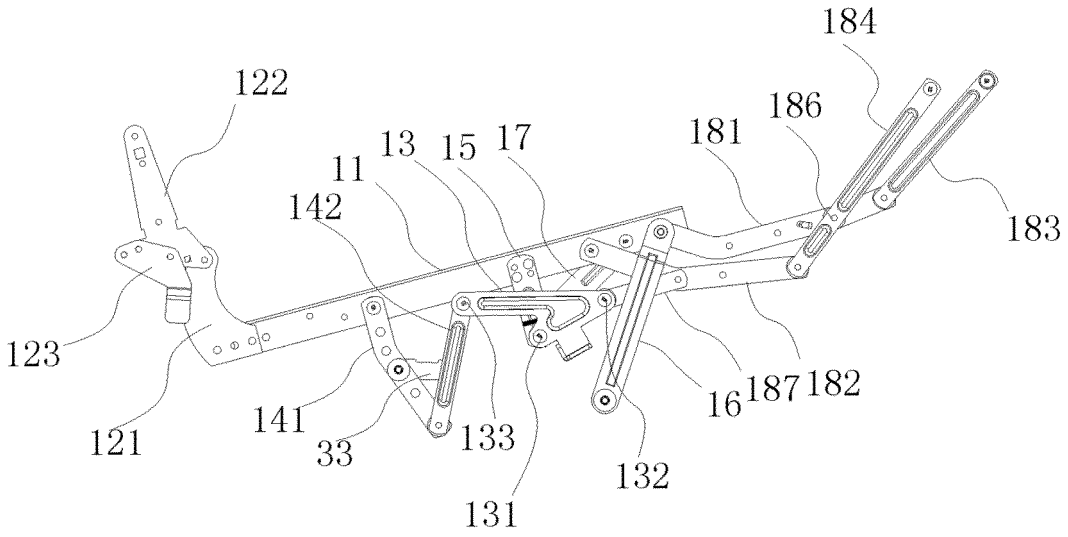
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FIG. 8

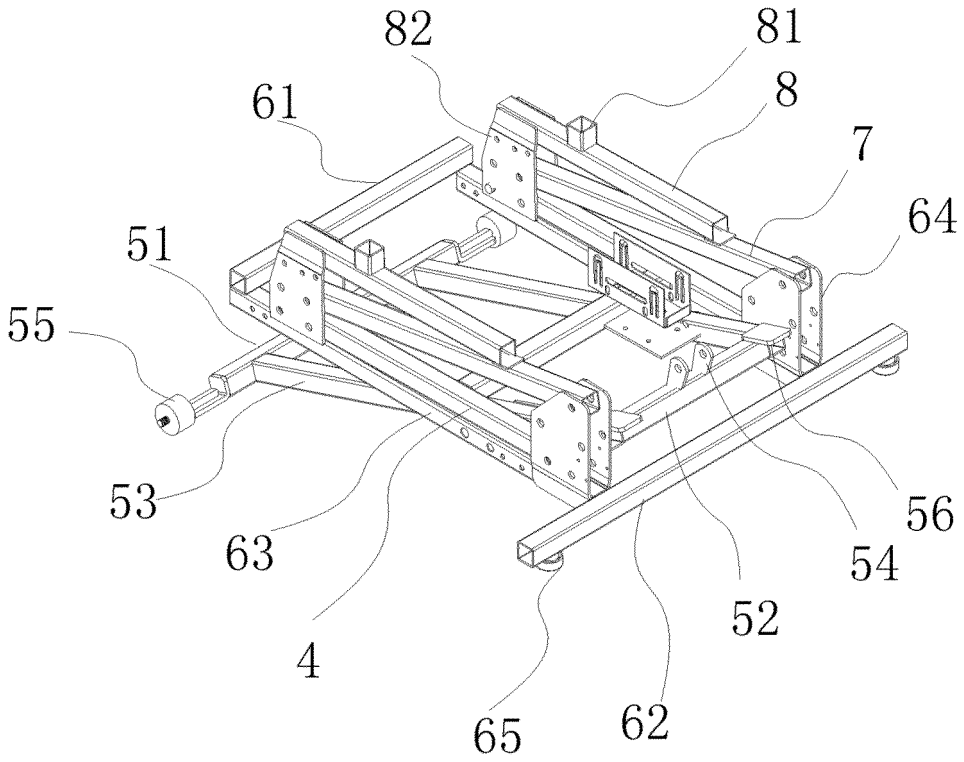

FIG. 9

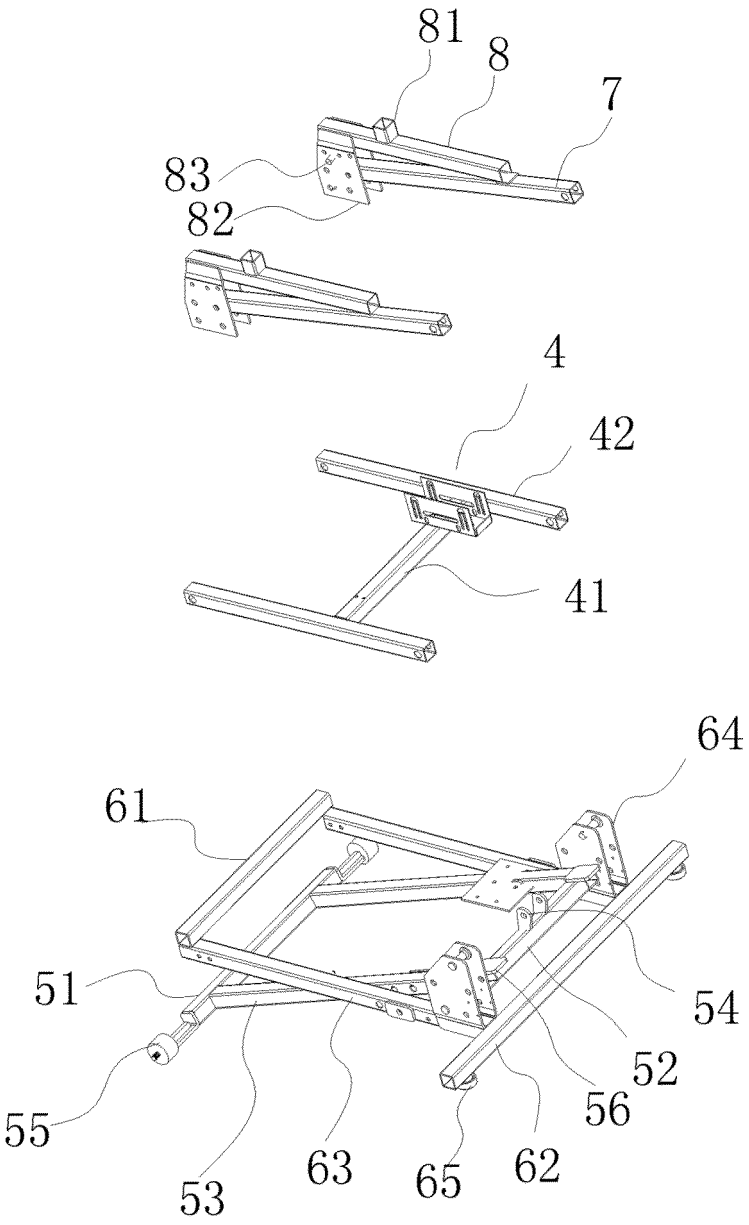

FIG. 10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/114517

A. CLASSIFICATION OF SUBJECT MATTER

A47C 1/02(2006.01)i; A47C 7/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47C 1/-; A47C 7/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS, CNTXT, CNKI, WPI, EPODOC: 常州泽辉机械有限公司, 朱黎明, 张直行, 躺椅, 椅, 助站, 电动推杆, 底架 or 底座 or 基座, 铰接, 限位, deck chair, chair, stand+ w assist+, electric push rod, bottom frame, hinge, spacing

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 209090418 U (CHANGZHOU ZEHUI MACHINERY CO., LTD.) 12 July 2019 (2019-07-12) claims 1-9, description, paragraphs [0044]-[0059], and figures 1-10	1-10
PX	CN 109124120 A (CHANGZHOU ZEHUI MACHINERY CO., LTD.) 04 January 2019 (2019-01-04) claims 1-10, description, paragraphs [0021]-[0034], and figures 1-10	1-10
A	CN 108634654 A (ZHOU, Hui) 12 October 2018 (2018-10-12) description, paragraphs [0021]-[0026], and figures 1-5	1-10
A	CN 204889251 U (ZHEJIANG UNIVERSITY OF TECHNOLOGY) 23 December 2015 (2015-12-23) entire document	1-10
A	CN 107157163 A (HAINING MEIHUI MACHINERY CO., LTD.) 15 September 2017 (2017-09-15) entire document	1-10
A	CN 202892335 U (HHC CHANGZHOU CO., LTD.) 24 April 2013 (2013-04-24) entire document	1-10

☑ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 January 2020	**05 February 2020**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088** **China**	Authorized officer
Facsimile No. **(86-10)62019451**	Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/114517

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	CN 203538831 U (JIANGSU SHUYIDA MACHINERY CO., LTD.) 16 April 2014 (2014-04-16) entire document	1-10
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A	US 2014291950 A1 (STRYKER CORPORATION) 02 October 2014 (2014-10-02) entire document	1-10

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2019/114517

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 209090418 U	12 July 2019	CN 109124120 A	04 January 2019
CN 109124120 A	04 January 2019	CN 209090418 U	12 July 2019
CN 108634654 A	12 October 2018	None	
CN 204889251 U	23 December 2015	None	
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		US 10258158 B2	16 April 2019
		CN 207767908 U	28 August 2018
CN 202892335 U	24 April 2013	US 2014132039 A1	15 May 2014
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Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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- CN 203538831 U **[0003]**
- CN 203314481 U **[0003]**
- CN 203986974 U **[0003]**