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(54) **CHAIR**

(57) The invention a type of chair, which comprises seat rod, rear rod, front leg rod, foldable linkage slide bar, backrest rod and handrail rod. Foldable linkage slide bar is pivotally connected with rear rod at one end and pivotally connected with front leg rod at the other end. Foldable linkage slide bar is connected with seat rod through the first sliding sleeve and with front leg rod through the

second sliding sleeve. Top of front leg rod is connected with handrail rod through the third sliding sleeve. In the process of using, the height of seat rod can be adjusted by rotating front leg rod and rear rod as required by the user so as to realize height adjustment of the chair, which can meet use requirements of people with different heights and improve comfortableness of the user.

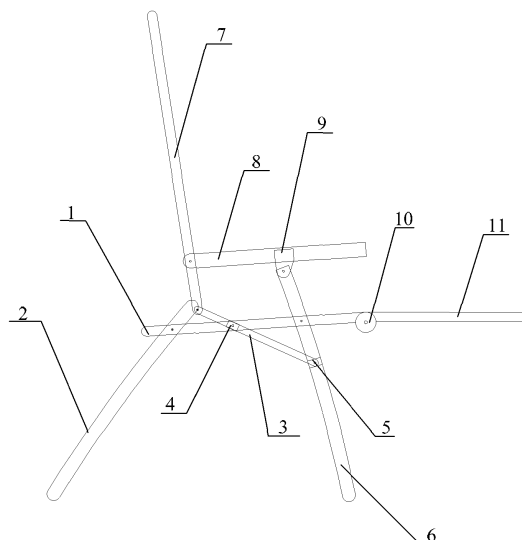


Fig. 1

Description

[0001] The application is required to be submitted to Patent Office of the People's Republic of China on November 24, 2014. All contents concerning priority of Chinese patent application with name of invention "a type of chair" and application No. 201420710843.6 are incorporated by reference into the present application.

Technology Field

[0002] The invention involves technology field of articles of daily use, especially a type of chair.

Background Technology

[0003] In existing technology, a chair is made up of seat rod, backrest rod connected with seat rod, handrail rod connected with backrest rod and front leg rod and rear rod respectively connected with front and back of seat rod. In existing technology, chair height cannot be adjusted. Users with different heights have to use chairs with the same height so that users too short or too high would feel less comfortable.

[0004] Therefore, it has become a technical problem to be solved urgently by technicians in the field as for how to realize adjustable height of a chair so as to improve user comfortableness in using the chair.

Description of the invention

[0005] Given the above situation, the invention provides a type of chair to realize adjustable height of a chair and improve chair comfortableness.

[0006] To realize the above purpose, the invention provides a technical proposal as follows:

A type of chair, comprising

- a seat rod, which is a U-shaped seat rod;
- a rear rod, which can be pivotally connected with said seat rod in the middle part;
- a foldable linkage slide bar, which can be pivotally connected with top of said rear rod at one end and in sliding joint with said seat rod through the first sliding sleeve;
- a front leg rod connected with the other end of foldable linkage slide bar through second sliding sleeve, which can be pivotally connected with said seat rod. Said second sliding sleeve is located below said seat rod;
- a backrest rod connected with said seat rod;
- a handrail rod, which is pivotally connected with

said backrest rod at one end and connected with top of said front leg rod at the other end through the third sliding sleeve.

[0007] Preferably in said chair, said rear rod consists of two parallel-mounted first straight bars and a vertically-mounted first stretcher connected with said first straight bar.

[0008] Preferably in said chair, said front leg rod includes two parallel-mounted second straight bars and a vertically-mounted second stretcher connected with said second straight bar.

[0009] Preferably in said chair, it also includes foot rest which is in U shape faced to backrest rod and said U-shaped seat rod is open to the foot rest. Open ends of said U-shaped foot rest and said U-shaped seat rod are mounted in opposite. Said foot rest and said seat rod are pivotally connected.

[0010] Preferably in said chair, said foot rest and said seat rod are pivotally connected through gear adjusting components, which include:

- seat rod fittings permanently connected with said seat rod. Said seat rod fittings are equipped with angle gears, which are equipped with notches on the side wall. Said seat rod fittings are equipped with bulges on the inner wall to match notches and with fix shaft in the center to match axle hole of said angle gears. The fix shaft is sheathed with spring which is mounted between said seat rod fittings and said angle gears;
- foot rest fittings permanently connected with said foot rest that are equipped with helical gears on the inner wall to mesh with said angle gears. Said foot rest fittings are connected with said seat rod fittings in thread;
- buttons that are equipped with bulges to press said angle gears. Said foot rest fittings are equipped with holes to match said bulges which have claspers at the end.

[0011] Preferably in said chair, said backrest rod and said seat rod are jointed through a bolt.

[0012] It can be seen from the above technical proposal that the chair provided by the invention includes seat rod, rear rod, front leg rod, foldable linkage slide bar, backrest rod and handrail rod. Foldable linkage slide bar is pivotally connected with rear rod at one end and pivotally connected with front leg rod at the other end. Foldable linkage slide bar is connected with seat rod through the first sliding sleeve and front leg rod through the second sliding sleeve. Top of front leg rod is connected with handrail rod through the third sliding sleeve. In the process of using, the height of seat rod can be adjusted by rotating front leg rod and rear rod as required by the user so as to realize height adjustment of the chair, which can

meet use requirements of people with different heights and improve comfortableness of the user.

Brief Description of Figures

[0013] In order to illustrate examples of the invention or technical proposal in existing technology more clearly, attached figures to be used in the description of examples or existing technology shall be introduced briefly below. Obviously the attached figures described below are only some examples of the invention. Common technical personnel in the field can acquire other figures in accordance with these figures without contributing any creative labor.

Figure 1 is structural representation provided by the invention examples when foot rest of the chair is in the level state;

Figure 2 is structural representation provided by the invention examples when the chair is folded partly;

Figure 3 is structural representation provided by the invention examples when backrest rod of the chair is adjusted backward to a certain angle;

Figure 4 is structural representation provided by the invention examples when backrest rod of the chair is in the level state;

Figure 5 is structural representation provided by the invention examples when the chair is in the folded state;

Figure 6 is three-dimensional structural representation of the chair provided by the invention examples;

Figure 7 is structural representation of gear adjusting components provided by the invention examples.

[0014] 1. Seat rod, 2. Rear rod, 21. First straight bar, 22. First stretcher, 3. Foldable linkage slide bar, 4. First sliding sleeve, 5. Second sliding sleeve, 6. Front leg rod, 61. Second straight bar, 62. Second stretcher, 7. Backrest rod, 8. Handrail rod, 9. Third sliding sleeve, 10. Gear adjusting components, 101. Seat rod sittings, 102. Angle gears, 103. Spring, 104. Foot rest fittings, 105. Button, 11. Foot rest.

Specific Implementation

[0015] The invention publicizes a type of chair to realize adjustable height of a chair and improve chair comfortableness of the user.

[0016] Below technical proposal in the invention examples shall be described clearly and completely in combination with attached figures in the invention examples. Obviously said examples are only a part of implementation examples of the invention rather than all the exam-

ples. All the other implementation examples acquired by common technical personnel in the field based on examples without any creative labor in the invention is within the scope of invention protection.

[0017] Please refer to Figure 1 - Figure 7. Figure 1 is structural representation provided by the invention examples when foot rest of the chair is in the level state; Figure 2 is structural representation provided by the invention examples when the chair is folded partly; Figure 3 is structural representation provided by the invention examples when backrest rod of the chair is adjusted backward to a certain angle; Figure 4 is structural representation provided by the invention examples when backrest rod of the chair is in the level state; Figure 5 is structural representation provided by the invention examples when the chair is in the folded state; Figure 6 is three-dimensional structural representation of the chair provided by the invention examples; Figure 7 is structural representation of gear adjusting components provided by the invention examples.

[0018] A type of chair, comprising seat rod 1, a U-shaped seat rod; rear rod 2, which can be pivotally connected with seat rod 1 in the center; foldable linkage slide bar 3, which can be pivotally connected with top of rear rod 2 at one end and is in sliding joint with seat rod 1 through the first sliding sleeve 4; front leg rod 6 connected with the other end of foldable linkage slide bar 3 through the second sliding sleeve 5, which can be pivotally connected with seat rod 1. The second sliding sleeve 5 is located below seat rod 1; backrest rod 7 connected with seat rod 1; handrail rod 8, which is pivotally connected with backrest rod 7 at one end and connected with top of front leg rod 6 at the other end through the third sliding sleeve 9.

[0019] Devices provided by the technical proposal include seat lever 1, rear rod 2, foldable linkage slide bar 3, front leg rod 6, backrest rod 7 and handrail rod 8, where rear rod 2 and seat rod 1 are pivotally connected, foldable linkage slide bar 3 and rear rod 2 are pivotally connected, foldable linkage slide bar 3 and seat rod 1 are in sliding joint, foldable linkage slide bar 3 and front leg rod 6 are in sliding joint, front leg rod 6 and seat rod 1 are pivotally connected, front leg rod 6 and handrail rod 8 are in sliding joint. Height of seat rod 1 can be adjusted by rotating angle of front leg rod 6 and rear rod 2. The process to adjust seat rod 1 higher is rotating rear rod 2 inwardly so that rear rod 2 drives seat rod 1 to move horizontally and vertically and foldable linkage slide bar 3 drives the first sliding sleeve 4 to slide towards rear rod 2 along seat rod 1, realizing angle adjustment between rear rod 2 and ground, and then rotating front leg rod 6 inwardly so that seat rod 1 is in level height near front leg rod 6 and near rear rod 2, and foldable linkage slide bar 3 drives the second sliding sleeve 5 to slide downwards along front leg rod 6, which further drives the third sliding sleeve 9 to slide outwardly along handrail rod 8, realizing angle adjustment between front leg rod 6 and ground. The process of adjust seat rod 1 lower is rotating rear rod 2 out-

wardly so that rear rod 2 drives seat rod 1 to move horizontally and vertically and foldable linkage slide bar 3 drives the first sliding sleeve 4 to slide towards front leg rod 6 along seat rod 1, realizing angle adjustment between rear rod 2 and ground, and then rotating front leg rod 6 outwardly so that seat rod 1 is in level height near front leg rod 6 and near rear rod 2, and foldable linkage slide bar 3 drives the second sliding sleeve 5 to slide upwards along front leg rod 6, which further drives the third sliding sleeve 9 to slide inwardly along handrail rod 8, realizing angle adjustment between front leg rod 6 and ground. To realize folding process of the chair provided by the proposal, continue drawing front leg rod 6 and rear rod 2 inwardly to make front leg rod 6 and rear rod 2 fit closely with seat rod 1, realizing chair folding; to use the chair, open front leg rod 6 and rear rod 2 outwardly to designated position.

[0020] Devices provided by the proposal can make up two triangles with adjustable angles by rear rod 2; seat rod 1, foldable linkage slide bar 3 and front leg rod 6 so that the process to adjust angles of front leg rod 6 and rear rod 2 is stable.

[0021] Rear rod 2 has several forms. In a specific way, rear rod 2 includes two parallel-mounted first straight bars 21 and a vertically-mounted first stretcher 22 connected with first straight bar 21, that is rear rod 2 is in I-shape on the whole; or rear rod 2 is in U shape, and the U-shaped rear rod 2 is open towards seat rod 1; or rear rod 2 includes two parallel-mounted first straight bars 21 and a vertically-mounted first stretcher 22 connected with first straight bar 21, and there are at least two first stretchers 22; or rear rod 2 includes two parallel-mounted first straight bars 21 and a stretcher plate mounted between first straight bars 21.

[0022] Front leg rod 6 has several forms. In a specific way, front leg rod 6 includes two parallel-mounted second straight bars 61 and a vertically-mounted second stretcher 62 connected with second straight bar 61, that is front leg rod 6 is in I-shape on the whole; or front leg rod 6 is in U shape, and the U-shaped front leg rod 6 is open towards seat rod 1; or front leg rod 6 includes two parallel-mounted second straight bars 61 and a vertically-mounted second stretcher 62 connected with first straight bar 61, and there are at least 2 second stretchers 62.

[0023] For the convenience of user, it also includes foot rest 11 connected with seat rod 1. Foot rest 11 is in U shape mounted facing backrest rod 7. U-shaped seat rod is open towards foot rest 11. Open ends of U-shaped foot rest and U-shaped seat rod are mounted in opposite and foot rest 11 and seat rod 1 are pivotally connected. In the process of using, rotate foot rest 11 for support and folding. When foot rest 11 supports, users can put foot on foot rest 11 for rest. If not required, foot rest 11 can be folded, which is convenient for office work.

[0024] Foot rest 11 can be rotated for support and folding in the following forms:

Foot rest 11 and seat rod 1 are pivotally connected

through gear adjusting components 10, which includes seat rod fittings 101 permanently connected with seat rod 1 and seat rod fittings 101 are equipped with angle gears 102 on the end face, which are equipped with notches on the side wall. Seat rod fittings 101 are equipped with bulges on the inner wall to match notches and with fix shaft in the center to match axle hole of angle gears. The fix shaft is sheathed with spring 103 which is mounted between seat rod fittings 101 and angle gears 102. It also includes foot rest fittings 104 permanently connected with foot rest 11 that are equipped with helical gears on the inner wall to mesh with angle gears 102; button 105 that is equipped with bulges to directly press angle gears 102. Foot rest fittings 104 are equipped with holes to match the bulge which have clasps at the end. To use foot rest 11, directly pull foot rest 11 to realize angle adjustment; to fold foot rest 11 or adjust the angle, press button 105 to make bulges on button 105 drive angle gears 102 to push spring so that helical gears on foot rest fittings 104 and angle gears 102 get separated, realizing angle adjustment of foot rest 11. After adjustment, loosen button 105 and angle gears 102 meshes with helical gears on foot rest fittings 104 under reset stretch of spring 103 to avoid rotating of foot rest 11 during use. The adjustment method is easy to operate.

[0025] There are also many other pivoting forms for foot rest 11. For instance, foot rest 11 and seat rod 1 can be directly jointed through a bolt and angle adjustment of foot rest 11 can be realized by adjusting tightness of the bolt.

[0026] In order to further improve user comfortable-ness, backrest rod 7 and seat rod 1 are jointed through a bolt. In the process of using, keep backrest rod 7 flat to allow backrest rod 7 and seat rod 1 in the same plane and the chair can be used as a bed. The chair provided by the proposal can be used both as a chair and a bed, increasing functions of the chair.

[0027] Devices provided by the proposal can realize chair folding. Other than folding and expanding process of front leg rod 6 and rear rod 2 as well as folding and expanding process of foot rest 11 mentioned above, backrest rod 7 can also be folded. Devices provided by the proposal can be folded as is shown in Figure 5, which can minimize occupation area after the chair is folded.

[0028] The above descriptions for publicized examples allow professional technicians in the field to realize or use the invention. It shall be clear to make various modifications of these examples as for professional technicians in the field. General principles defined in the text can be realized in other examples on the condition of not breaking away from spirit or scope of the invention. Therefore, the invention shall not be limited to these examples indicated in the text, but to conform to the widest scope consistent with principles and unique features publicized in the text.

Claims

1. A chair, comprising

- seat rod (1), which is a U-shaped seat rod (1); 5
- a rear rod (2), which can be pivotally connected with said seat rod (1) in the middle part;
- a foldable linkage slide bar (3), which can be pivotally connected with top of said rear rod (2) at one end and in sliding joint (3) with said seat rod (1) through the first sliding sleeve (4); 10
- a front leg rod (6) connected with the other end of foldable linkage slide bar (3) through the second sliding sleeve (5), which can be pivotally connected with said seat rod (1), said second sliding sleeve (5) is located below said seat rod (1); 15
- a backrest rod (7) connected with said seat rod (1);
- a handrail rod (8), which is pivotally connected with said backrest rod (7) at one end and connected with top of said front leg rod (6) through the third sliding sleeve (9). 20

2. The chair according to claim 1, **characterized in that** said rear rod (2) includes two parallel-mounted first straight bars (21) and a vertically-mounted first stretcher (22) connected with said first straight bar (21). 25

3. The chair according to claim 1, **characterized in that** said front leg rod (6) includes two second straight bars (61) mounted parallel and second stretcher (62) mounted vertically and connected with said second straight bar (61). 30 35

4. The chair according to claim 1, **characterized in that** it also includes foot rest (11) connected with said seat rod (1), said foot rest (11) is U-shaped faced to said backrest rod (7) and said U-shaped seat rod is open to said foot rest (11), open ends of said U-shaped foot rest and U-shaped seat rod are mounted in opposite, said foot rest (11) and the seat rod (1) are pivotally connected. 40 45

5. The chair according to claim 1, **characterized in that** said foot rest (11) and said seat rod (11) are pivotally connected through gear adjusting components (10), including seat lever fittings (101) permanently connected with said seat rod (1), said seat rod fittings (101) are equipped with angle gears (102), which are equipped with notches on the side wall, wherein said seat rod fittings (101) are equipped with bulges on the inner wall to match notches and with fix shaft in the center to match axle hole of said angle gears, wherein the fix shaft is sheathed with spring (103) which is mounted between said seat rod fittings (101) and said angle gears (102), wherein foot rest fittings 50 55

(104) permanently connected with said foot rest (11) that are equipped with helical gears on the inner wall to mesh with said angle gears (102). Said foot rest fittings (104) are connected with said seat rod fittings (101) in thread, wherein button (105) that is equipped with bulges to press said angle gears (102), and wherein said foot rest fittings (104) are equipped with holes to match said bulges which have clasps at the end.

6. The chair according to claim 1, **characterized in that** said backrest rod (7) and said seat rod (1) are jointed through a bolt.

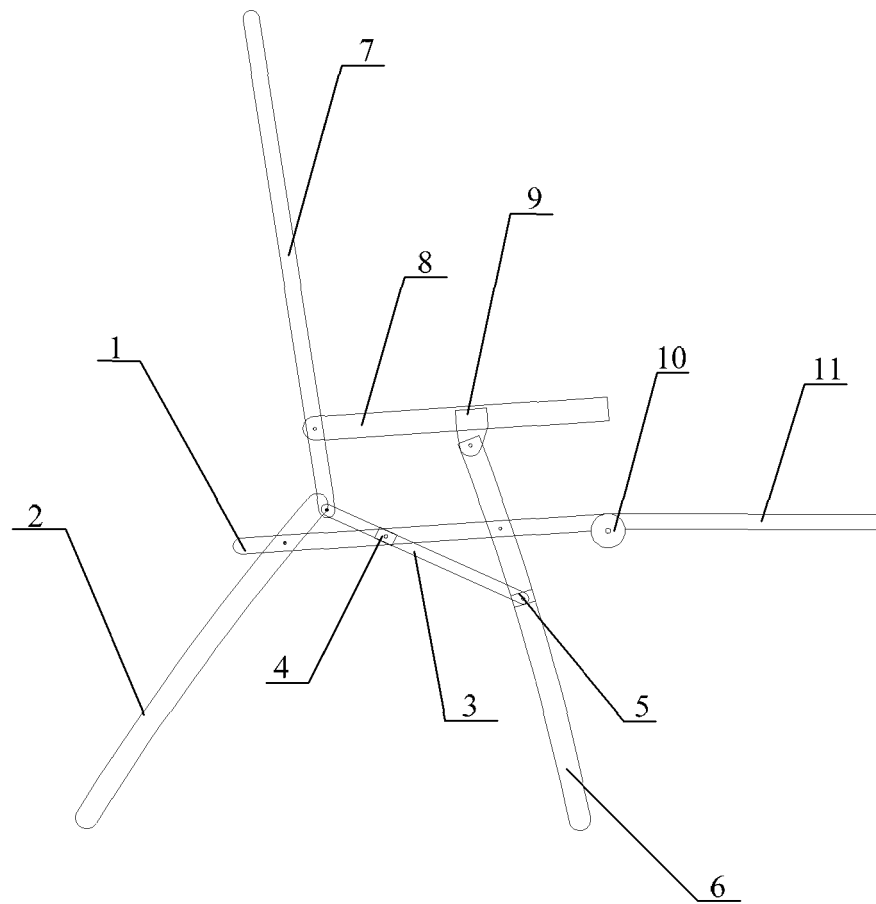


Fig. 1

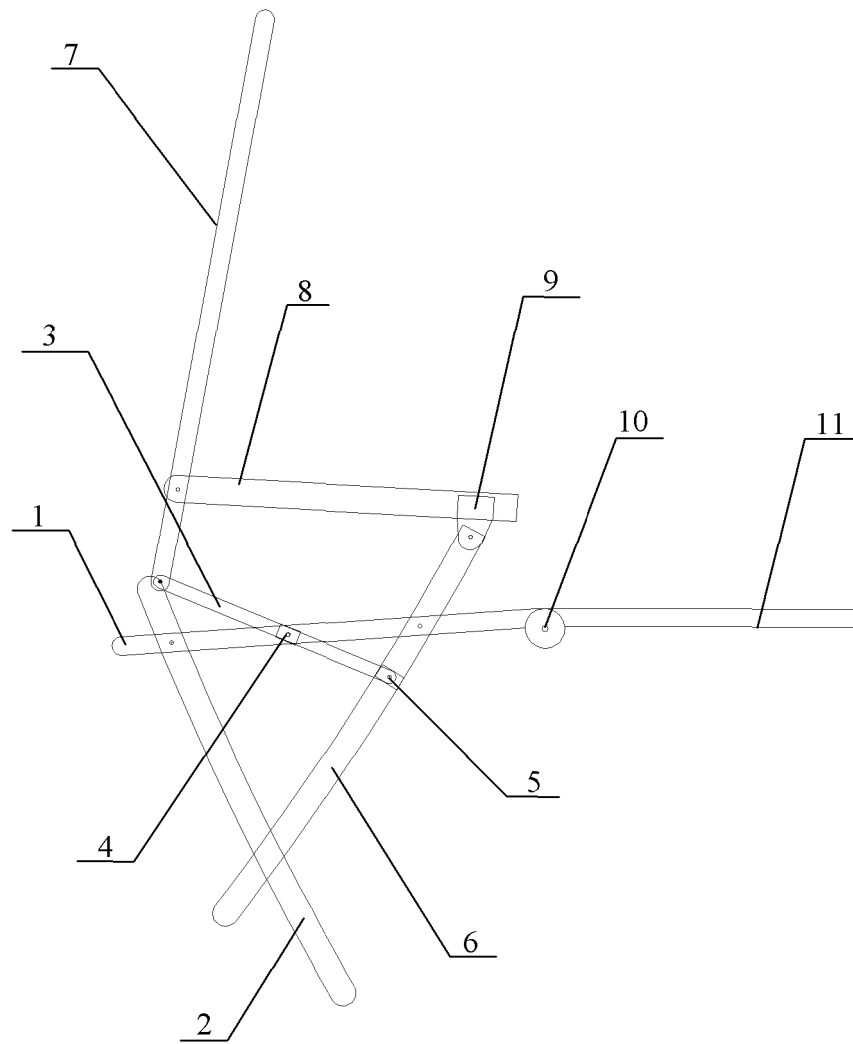


Fig. 2

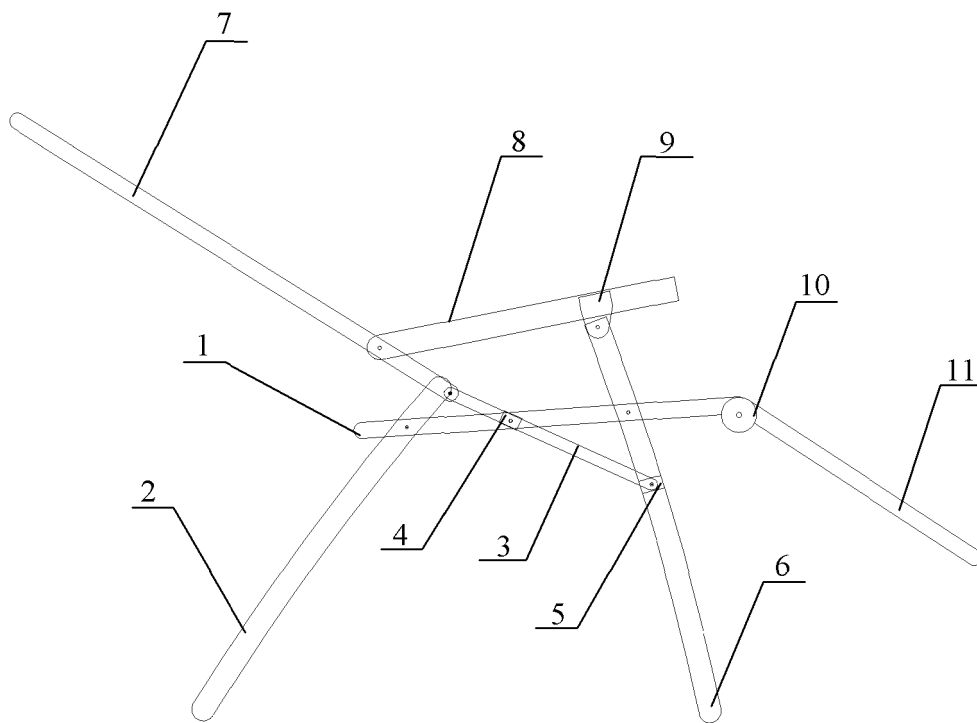


Fig. 3

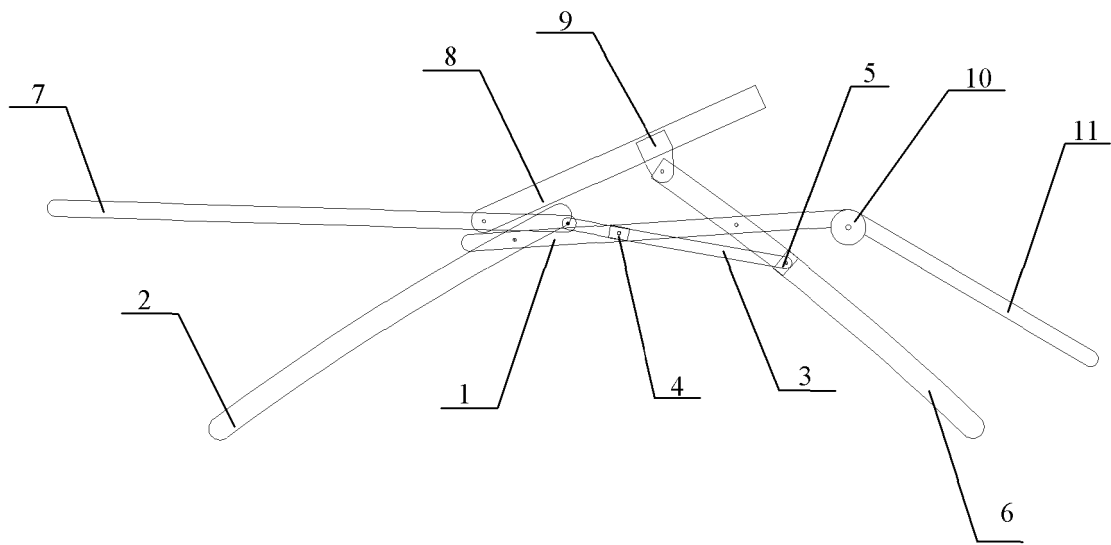


Fig. 4

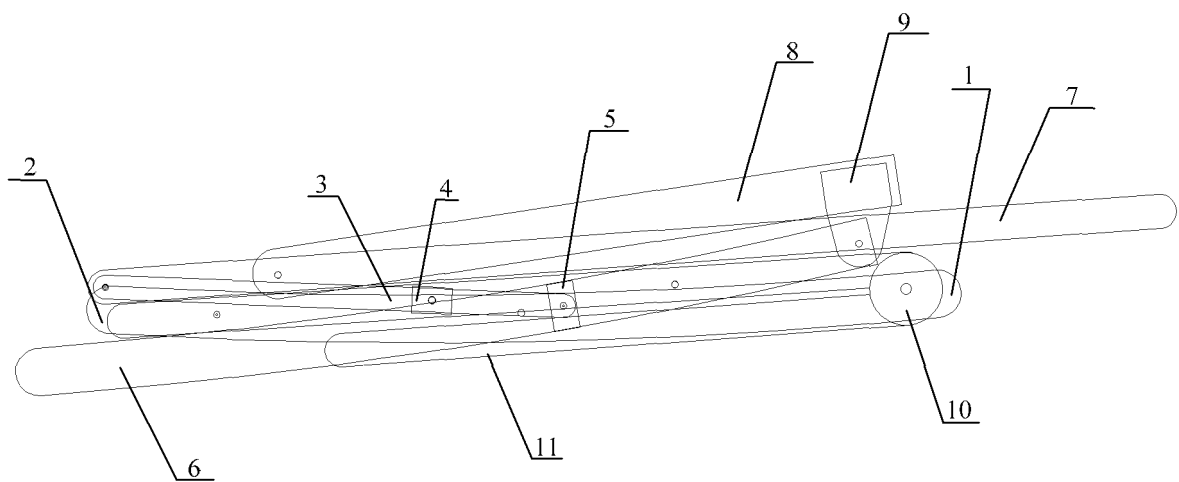


Fig. 5

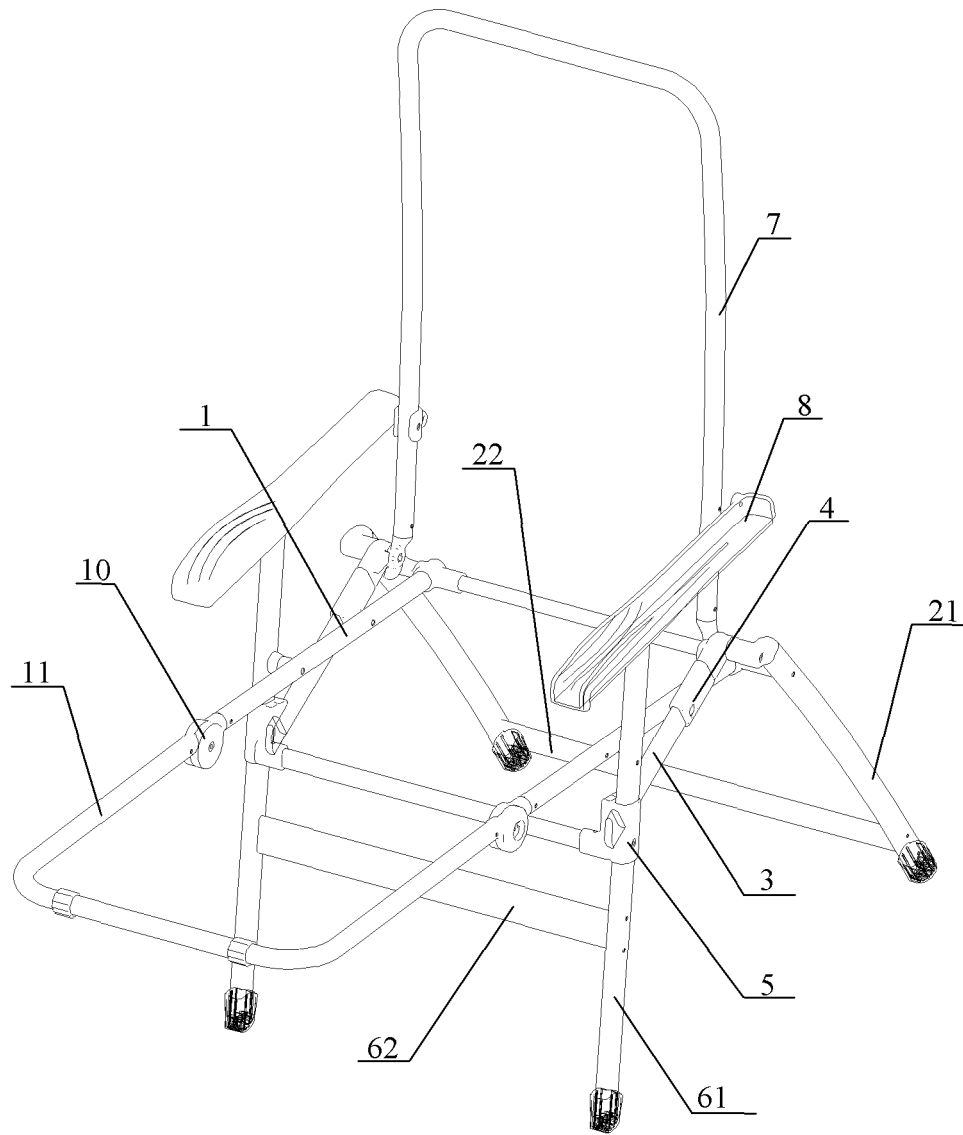


Fig. 6

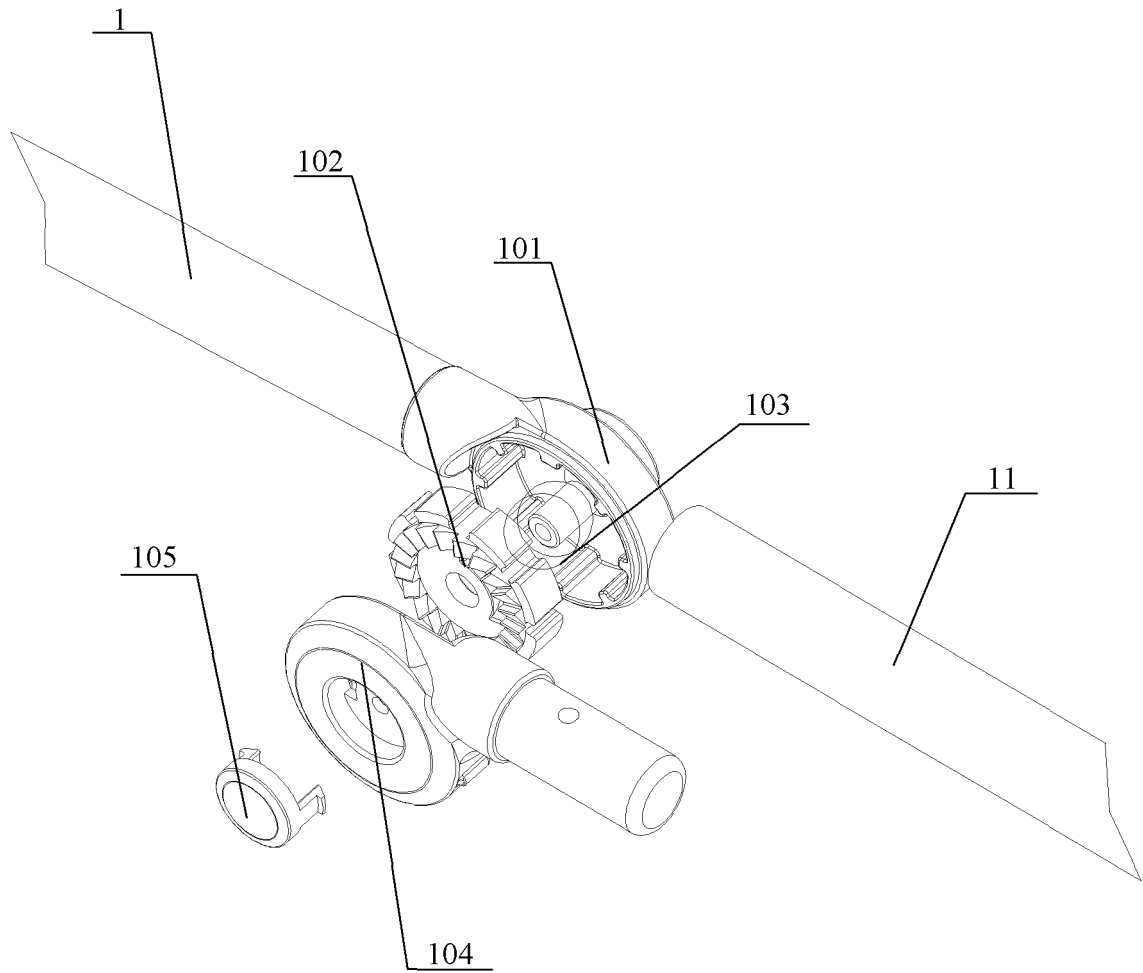


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2014/094637

A. CLASSIFICATION OF SUBJECT MATTER

A47C 4/04 (2006.01) i; A47C 7/50 (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

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, VEN: backrest, slide bar, footrest, fold, chair, sofa, back leg, back support, front leg, front support, slider, overlap, U shape, leg supporter

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 201920176 U (ZHEJIANG HENGFENG TOP LEISURE CO., LTD.), 10 August 2011 (10.08.2011), description, paragraphs [0026]-[0027], and figures 1-6	1-4, 6
A	CN 201139254 Y (LIN, Yifeng), 29 October 2008 (29.10.2008), the whole document	1-6
A	CN 2417780 Y (XU, Gaofa), 07 February 2001 (07.02.2001), the whole document	1-6
A	CN 2634930 Y (XIAMEN JINXIONG ENTERPRISE CO., LTD.), 25 August 2004 (25.08.2004), the whole document	1-6
A	JP 4853988 B2 (IURA KK), 11 January 2012 (11.01.2012), the whole document	1-6

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

* Special categories of cited documents:	"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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"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	"&" document member of the same patent family

 Date of the actual completion of the international search
 20 August 2015 (20.08.2015)

 Date of mailing of the international search report
06 September 2015 (06.09.2015)

 Name and mailing address of the ISA/CN:
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 Authorized officer
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2014/094637

5	Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
	CN 201920176 U	10 August 2011	None	
	CN 201139254 Y	29 October 2008	None	
10	CN 2417780 Y	07 February 2001	None	
	CN 2634930 Y	25 August 2004	None	
	JP 4853988 B2	11 January 2012	JP 2003102788 A	08 April 2003
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Form PCT/ISA/210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 201420710843 [0001]