US 20090174230A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2009/0174230 A1**

(43) **Pub. Date: Jul. 9, 2009**

Chen

(54) **FOLDABLE CHAIR FRAME**

(76) Inventor: **Kao-San Chen**, Tainan (TW)

Correspondence Address:
Chen, Kao-San
No.2, Alley 492, Hai Tien Rd., Sec.2
TAINAN 709 (TW)

(21) Appl. No.: **12/006,374**

(22) Filed: **Jan. 3, 2008**

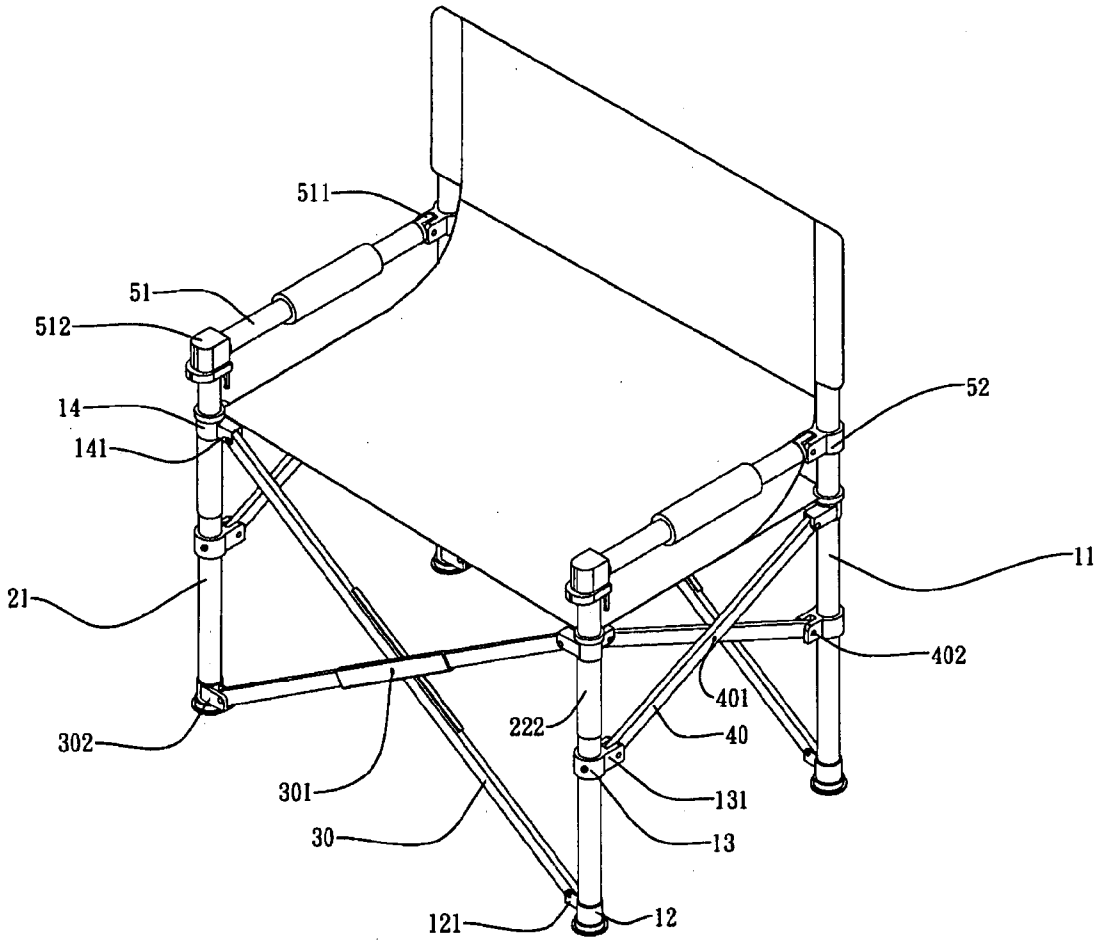
Publication Classification

(51) **Int. Cl.**
A47C 4/00 (2006.01)

(52) **U.S. Cl.** **297/16.1**

(57) **ABSTRACT**

A foldable chair frame includes front leg rod units, rear leg rod units, cross-shaped long leg members, cross-shaped short leg members and movable armrest unit. The front leg rod unit includes a pair of front leg rod members, base caps, receiving caps and receiving cap base of the front leg. The rear leg rod unit includes a pair of rear leg rod members, base caps, receiving caps and receiving cap base of the rear leg. The cross-shaped long leg members and cross-shaped short leg members are in bar shape and have pin holes being installed respectively at the central part and each ends thereof. The movable armrest unit includes a pair of main shaft and fixing caps.



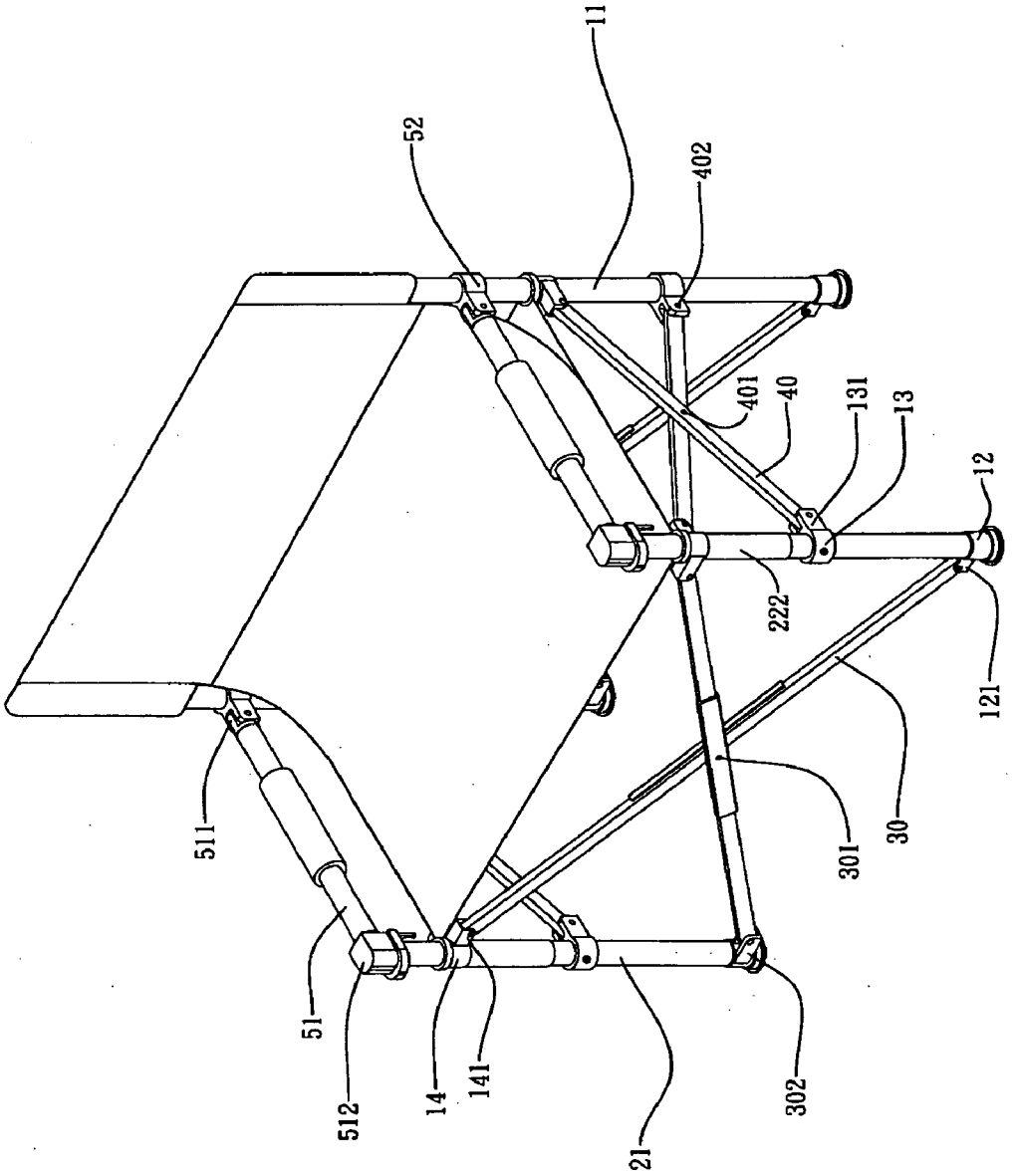


FIG. 1

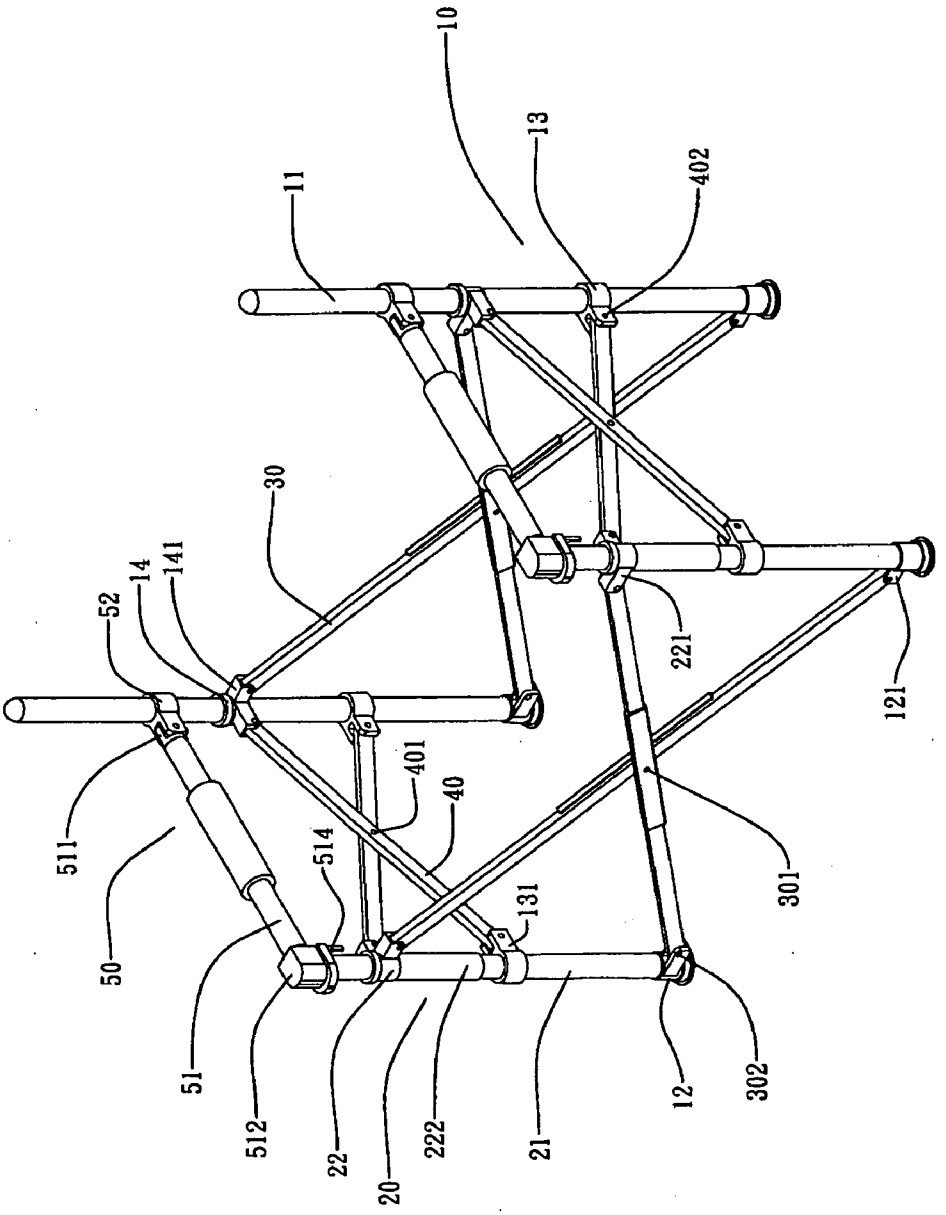

10
13
402
11
30
52
14
141
221
121
401
40
511
514
301
131
50
51
512
22
20
222
21
12
302

FIG. 2

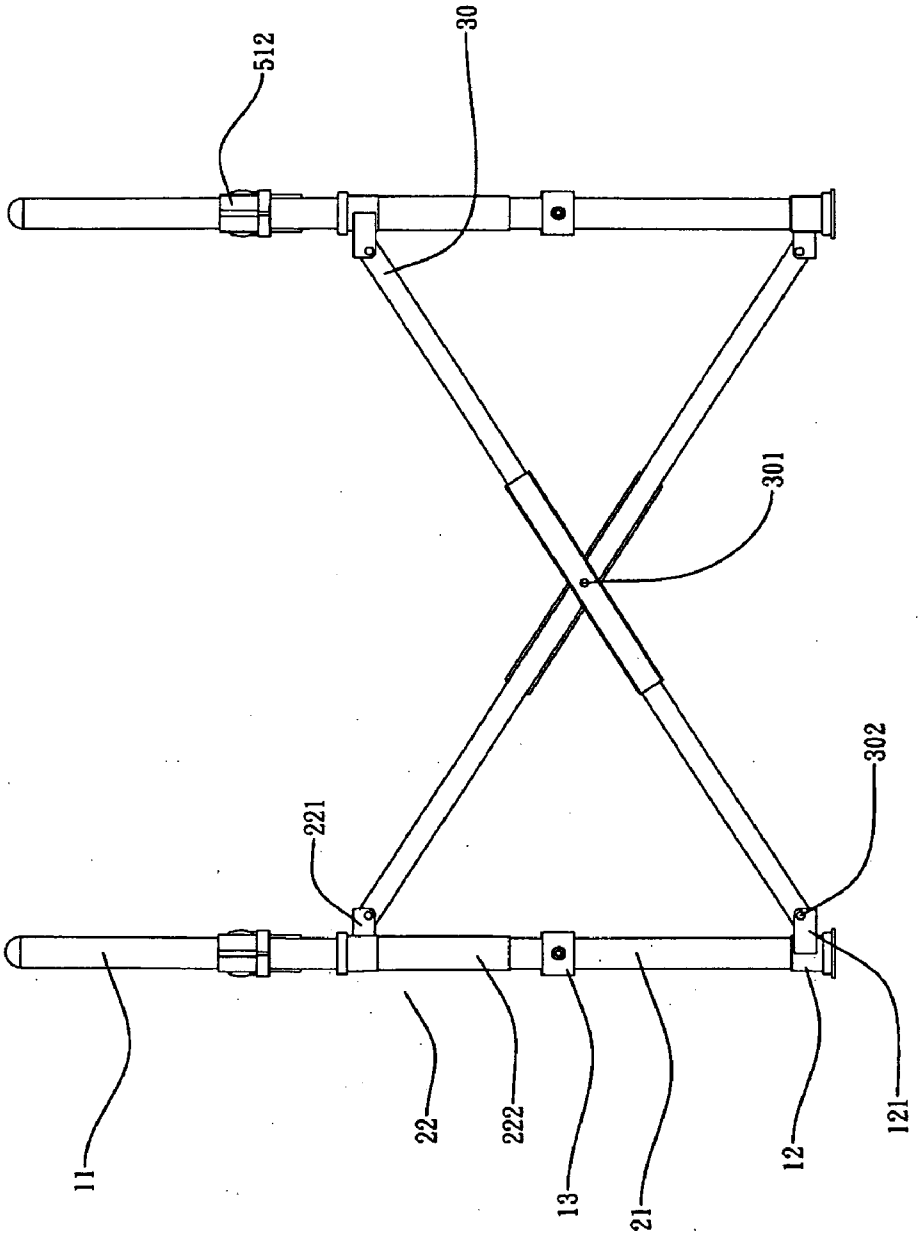


FIG. 3

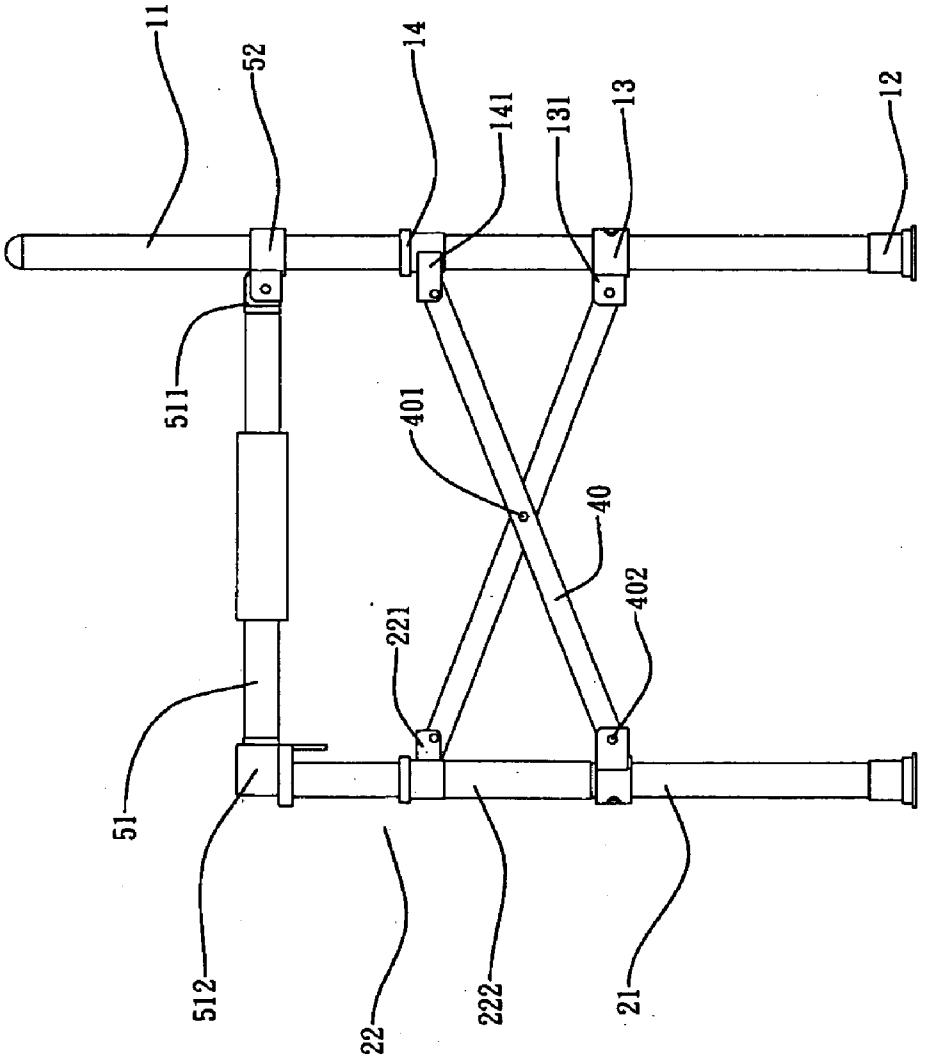


FIG. 4

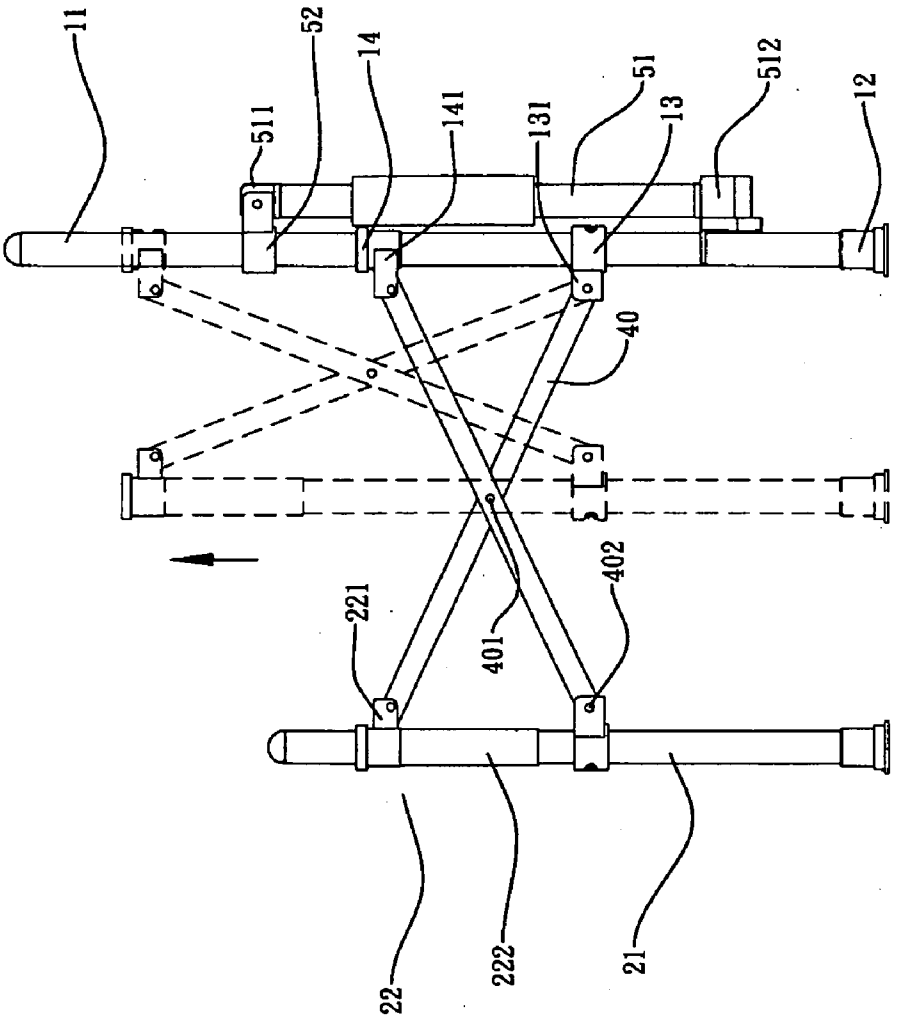


FIG. 5

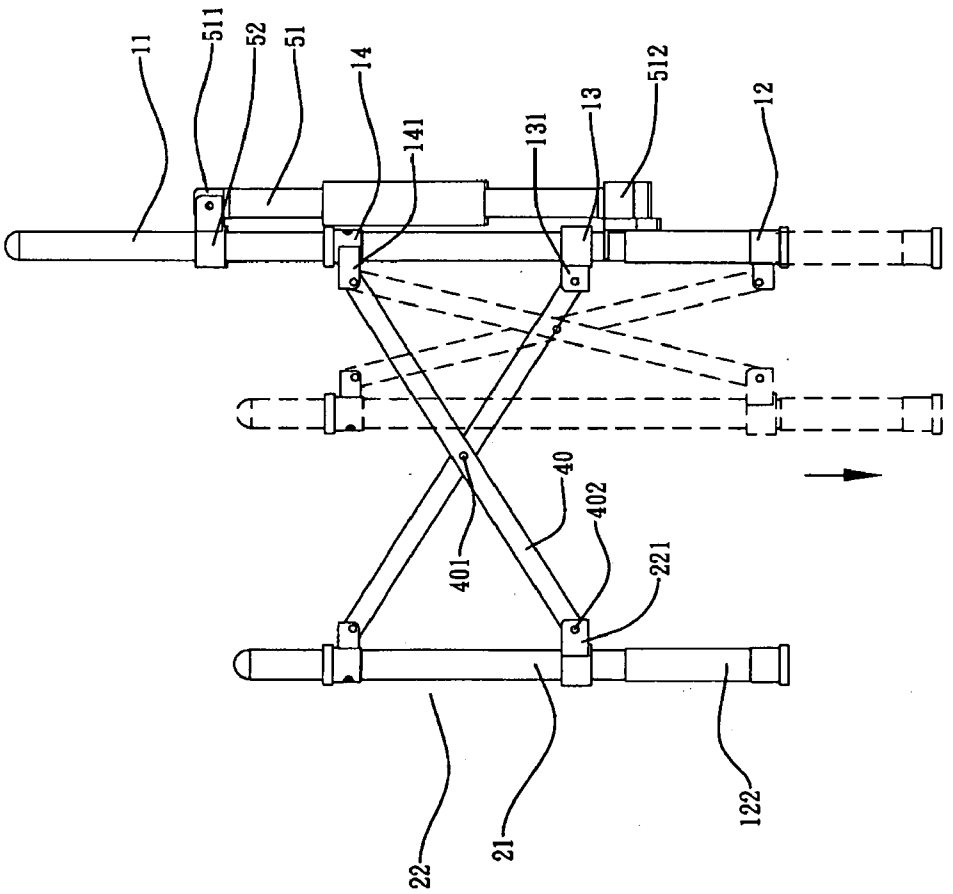


FIG. 6

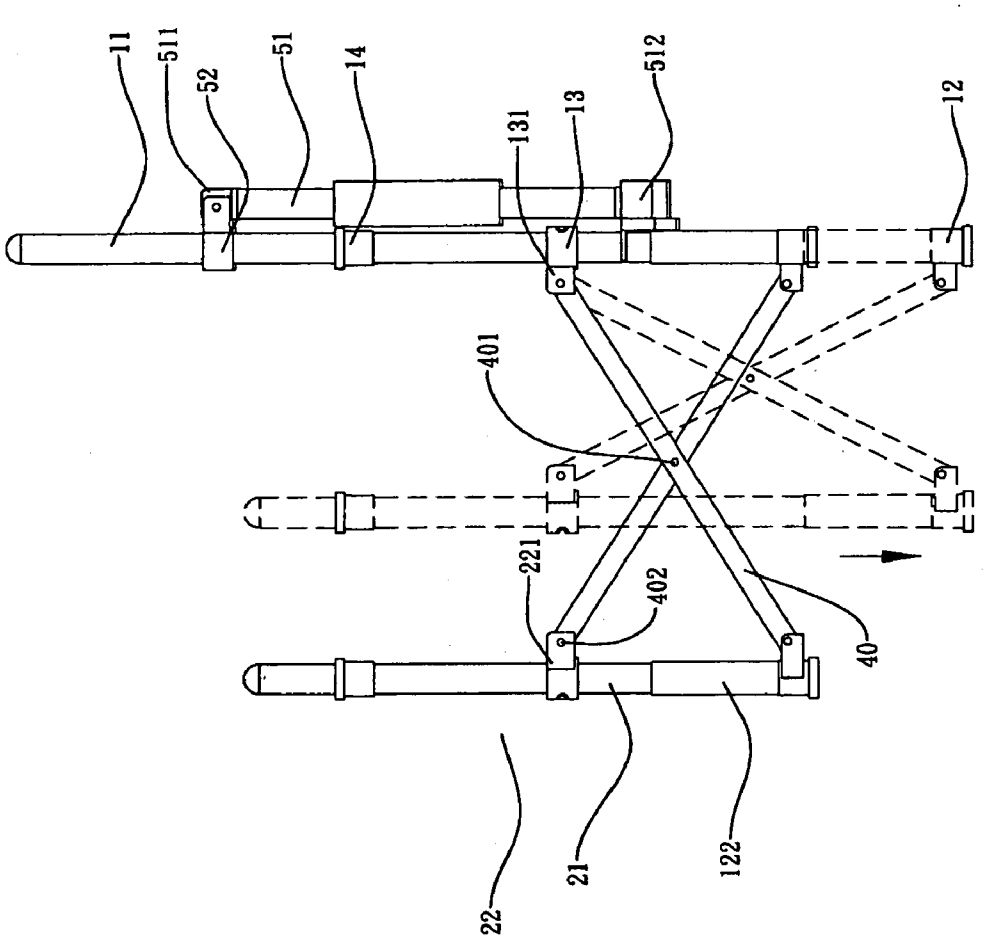


FIG. 7

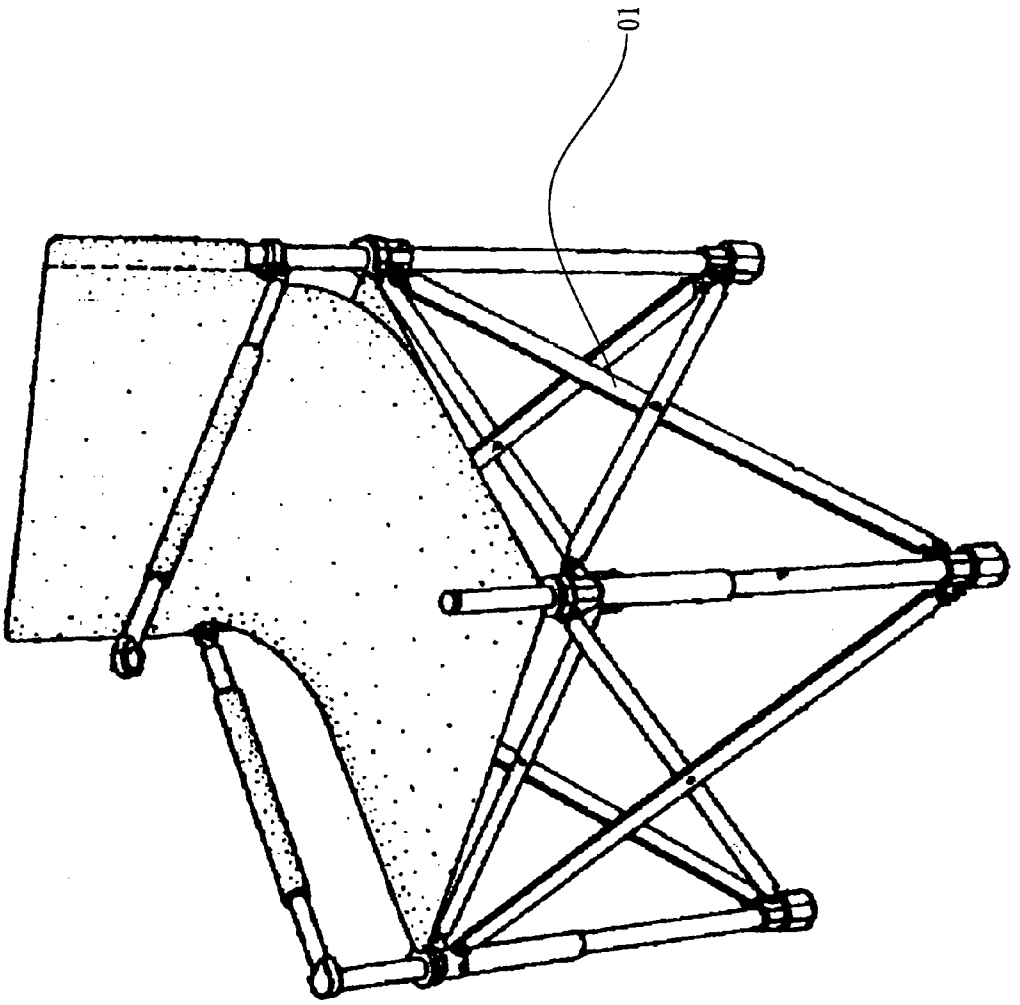


FIG. 8 (Prior Art)

FOLDABLE CHAIR FRAME

BACKGROUND OF THE PRESENT INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a chair frame, particularly to a cross-shaped foldable chair frame.

[0003] 2. Description of the Related Arts

[0004] As shown in FIG. **8**, the conventional foldable chair is shown to comprise crossed-shaped front, rear, left and right leg unit which are equal in length. Therefore the shape is shown to be square when the chair is completely in unfolded position. However, people usually need larger frontal than lateral space when seat on the chair in concern of being ergonomic, which means that when the frontal space is enlarged, the lateral space will also definitely be enlarged. Therefore, such design has the disadvantages such as not being able to match the ergonomic problem, wasting material and enhancing the cost.

SUMMARY OF THE PRESENT INVENTION

[0005] Please refer to FIGS. **1**, **2**, **3** and **4**, the inventors has improved the design in view of the shortcomings of the prior art. The present invention is a new structure of cross-shaped foldable chair frame. The advantages are as following.

[0006] First, the present invention comprises leg units in different length which respectively form two X-shaped structures in different size and make the whole chair frame structure be in rectangular shape and meet the ergonomic standard.

[0007] Second, two opposite ends of left and right leg units are respectively mounted to the receiving caps on the middle and upper parts of the front and rear leg rods to keep the leg unit in X shape.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** is a perspective view of the present invention.

[0009] FIG. **2** is a perspective view of the preferred embodiment of the foldable chair frame according to the present invention.

[0010] FIG. **3** is a front view of the preferred embodiment of the foldable chair frame of the present invention.

[0011] FIG. **4** is a side view of the preferred embodiment of the foldable chair frame of the present invention.

[0012] FIG. **5** is a side view illustrating the action of folding the preferred embodiment.

[0013] FIG. **6** is the second example of the side view illustrating the action of folding the preferred embodiment.

[0014] FIG. **7** is the third example of the side elevation view illustrating the action of folding the preferred embodiment.

[0015] FIG. **8** is a perspective view of a conventional foldable chair frame.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

[0016] Please refer to FIGS. **1** through **7**, the preferred embodiment of the foldable chair frame which is in rectangular shape when being unfolded is shown to comprise rear rod units (**10**), front leg rod units (**20**), cross-shaped long leg members (**30**), cross-shaped short leg members (**40**) and movable armrest units (**50**).

[0017] The rear leg rod unit (**10**) comprises a pair of rear leg rod members (**11**), each of which is in cylinder shape, base caps (**12**), which are respectively installed with a pivot bracket (**121**) for engaging with the cross-shaped long leg members (**30**), receiving caps (**13**) and receiving cap base of the rear legs (**14**). The receiving caps (**13**) which are respectively installed with pivot brackets (**131**) for engaging with cross-shaped short leg member (**40**). The receiving cap bases of the rear legs (**14**) which are respectively installed with a pivot bracket (**141**) for engaging with cross-shaped long leg members (**30**) and cross-shaped short leg members (**40**).

[0018] The front leg rod unit (**20**) includes a pair of front leg rod members (**21**), each of which is in cylinder shape, the base caps (**12**), the receiving caps (**13**), and the receiving cap bases of the front legs (**22**) which are respectively mounted on the front leg rod members (**21**) and installed with a pivot bracket (**221**), of which a cylinder sheath (**222**) extending from the bottom, for engaging with the cross-shaped long leg members (**30**) and cross-shaped short leg members (**40**).

[0019] The cross-shaped long leg members (**30**) and the cross-shaped short leg members (**40**) are respectively connected pivotally to each other via pin holes (**301**) which are installed at the end and middle of the leg members to form into X shape. The cross-shaped long leg members (**30**) are respectively installed between a pair of front leg rod units (**20**) and a pair of rear leg rod units (**10**) forming the front and rear sides of the chair frame structure. The cross-shaped short leg members (**40**) are respectively installed between a front leg rod unit (**20**) and a rear leg rod unit (**10**) forming the right and left sides of the chair frame structure.

[0020] The movable armrest unit (**50**) includes a pair of main shafts (**51**) in cylinder shape, and fixing caps (**52**). At one end of the main shaft (**51**) is installed with a protrusion (**511**) for engaging with the fixing cap (**52**), at another end of the main shaft (**51**) is installed with an end cap (**512**) which has a groove (**513**) inside for engaging with the front leg rod member (**21**) when the frame is in the unfolded position and a fixing clip (**514**) extending from the bottom of the end cap (**52**) to clip with the rear leg rod member (**11**) when the frame is in the folded position. The fixing cap (**52**) is engaged movably with the rear leg rod member (**11**) for the main shaft (**51**) being able to move around.

[0021] The preferred embodiment includes a pair of rear leg rod unit (**10**), a pair of front leg rod unit (**20**), four cross-shaped long leg members (**30**), four cross-shaped short leg members (**40**) and a pair of movable armrest units (**50**). The base cap (**12**) is installed at the bottom, the receiving cap (**13**) is mounted on the middle portion and the receiving cap base (**14**) is then installed at the upper portion of the rear leg rod member (**11**). Further more, the base cap (**12**) is installed on the bottom, the receiving cap (**13**) is mounted to the middle portion, and the receiving cap base (**22**) is then installed on the upper portion of the front leg rod member (**21**). Two long leg members (**30**) are connected and mounted pivotally to each other via a pin hole (**301**) in the central portion thereof to form the x-shape structure. The pin holes (**302**) of both ends of the long leg members (**30**) are respectively fixed to the pivot bracket (**121**) of the base cap (**12**) and the pivot bracket (**141**) of the receiving cap base (**14**) forming the front and rear side of the whole frame structure. Two short leg members (**40**) are connected and mounted pivotally to each other via the pin hole (**40**) in the central portion to form another X-shape structure. The pin holes (**401**) of both ends of one short leg member (**40**) are respectively fixed with the pivot bracket (**131**) on the receiving cap (**13**) of the rear leg rod unit (**10**) and with the pivot bracket (**221**) on the receiving cap base (**22**) of the front leg rod unit (**20**). The pin holes (**402**) of both ends of another short leg member (**40**) are respectively fixed to the

pivot bracket (**141**) on the receiving cap base of the rear leg (**14**) and to the pivot bracket (**131**) on the receiving cap (**13**) of the front leg rod unit (**20**) forming the right and left side of the whole frame structure. The fixing cap (**52**) is engaged with the protrusion (**511**) on the main shaft (**51**) forming the structure of the movable armrest unit (**50**).

[0022] When unfolding the frame, the rear leg rod members (**11**) and the front leg rod members (**21**) are pulled outward, and the corners of the seat mat are respectively installed with two rear leg rod members (**11**) and two front leg rod members (**21**). The fixing caps (**52**) of the two movable armrest units (**50**) are engaged with two rear leg rod members (**11**) while the groove (**513**) in the receiving cap base of the front leg (**22**) is installed with the top of the front leg rod member (**21**) to form the chair frame structure and the unfolded position.

[0023] When folding the frame structure, the receiving cap base of the front leg (**22**) is took off from the front leg rod member (**21**), the main shaft (**51**) is pressed downward, the fixing clip (**514**) on the receiving cap base of the front leg (**22**) is clipped and fixed to the rear leg rod member (**11**), then the front leg rod member (**21**) and the rear leg rod member (**11**) are together folded inward. Since the receiving cap (**13**) is locked up and immobile, therefore the receiving cap base of the rear leg (**14**) and the receiving cap base of the front leg (**22**) are forced lifted upward and the cross-shaped long and short legs is formed into I-shape from X-shape to complete the folding action.

[0024] Please refer to FIG. **6**, the second example of the preferred embodiment. One end of the cross-shaped long leg members (**30**) are respectively installed on the receiving cap of the rear leg (**14**) and the receiving cap of the front leg (**22**); another end of the cross-shaped long leg members (**30**) are installed on the base caps (**12**). One end of the cross-shaped short leg members (**40**) are respectively installed on the receiving cap of the rear leg (**10**) and the receiving cap of the front leg (**20**); another end of the cross-shaped short leg members (**40**) are installed on the receiving caps (**13**). The receiving cap of the front leg (**22**) and the receiving caps of the rear legs (**14**) are respectively mounted and fixed to the upper portion of the front leg rod member (**21**) and the rear leg rod member (**11**); meanwhile the receiving caps (**13**) are respectively installed movably on the front leg rod member (**21**) and the rear leg rod member (**11**). The cylinder sheath (**122**) of the base cap (**12**) is extending from its top capable of being moved upward and downward along the front leg rod member (**21**) and the rear leg rod member (**11**). When folding the frame structure, the base caps (**12**) are forced moving downward since the receiving cap of the front leg (**22**) and the receiving cap of the rear leg (**14**) are immobile, and the cross-shaped long leg member (**30**) along with the cross-shaped short leg member (**40**) are forced to move inward to complete the folding action.

[0025] Please refer to FIG. **7**, the third example of the preferred embodiment. One end of the cross-shaped long leg members (**30**) are respectively installed on the receiving cap of the front leg (**22**) and the receiving cap of the rear leg (**14**); another end of the cross-shaped long leg members (**30**) are respectively installed on the base caps (**12**). One end of the cross-shaped short legs members (**40**) are respectively installed on the base caps (**12**) and another ends are respectively installed on the receiving caps (**13**) which are mounted and fixed to the middle portion of the front leg rod member (**21**) and the rear leg rod member (**11**). The base caps (**12**) are installed movably on the lower portion of the front leg rod member (**21**) and the rear leg rod member (**11**). The cylinder sheath (**122**) of the base cap (**12**) is extending from its top and capable of moving upward and downward along the front leg rod member (**21**) and the rear leg rod member (**11**). When folding the frame structure, the base caps (**12**) are forced moving downward since the receiving cap (**13**) are immobile, and the cross-shaped long leg member (**30**) along with the cross-shaped short leg member (**40**) are forced to move inward to complete the folding action.

1-6. (canceled)

7. A foldable chair frame comprising:

a pair of cross-shaped long leg members and short leg members being installed with fixing holes respectively at the central part and the ends thereof, said cross-shaped long leg members being connected pivotally to each other via pin holes at the central part forming X-shape structure and being installed between a pair of front leg rod member and rear leg rod member forming the front and rear side of a frame structure; and

said cross-shaped short leg members being connected pivotally to each other via said pin holes at the central part forming X-shape structure and being installed between said rear leg rod members and said front leg rod members forming smaller area of left and right side of said frame structure and becoming a rectangular shape suitable for sitting in when said frame structure being in unfolded position;

one end of said cross-shaped long leg members being installed on a receiving cap base of the rear leg or said receiving cap base of the front leg, and the other end being correspondingly installed on a base cap at the bottom of said rear leg rod members or on a base cap at the bottom of said front leg rod members;

one end of said cross-shaped short leg members being installed on said receiving cap base of the rear leg or said receiving cap base of the front leg, and the other end of said cross-shaped short leg members being correspondingly installed on said receiving caps at the bottom of said rear leg rod members or on said receiving caps at the bottom of said front leg rod members.

8. The foldable chair frame according to claim **7**, wherein said receiving caps are respectively mounted and fixed to the middle portion of said rear leg rod members and front leg rod members; said receiving cap base of the front leg and said receiving cap base of the rear leg being respectively installed movably at the upper portion of said rear leg rod members and said front leg rod members; a cylinder sheath extending from the bottom of said receiving cap base of the front leg and being installed thereon.

9. (canceled)

10. The foldable chair frame according to claim **7**, wherein said receiving cap base of the front leg and said receiving cap base of the rear leg can also be respectively fixed to the upper portion of said front leg rod unit and said rear leg rod unit; said receiving caps being respectively installed movably on and capable of moving upward and downward along said front leg rod member and said rear leg rod member; a cylinder sheath extending from the bottom, for engaging with the bottom of said front leg rod members and said rear leg rod members and capable of moving upward and downward along said front leg rod members and said rear leg rod members.

11. The foldable chair frame according to claim **7**, one end of said cross-shaped long leg members being installed on said

receiving cap base of the rear leg and said receiving cap base of the front leg, and the other end being installed on said base cap;

one end of said cross-shaped short leg members being installed on said base caps, and the other end of said cross-shaped short leg members being installed on said receiving caps.

12. The foldable chair frame according to claim **10**, wherein said receiving caps are mounted and fixed to the middle portion of said front leg rod members and said rear leg rod members; said base caps being respectively installed movably on the lower portion of said front leg rod member and said rear leg rod member; said cylinder sheath extending from the top of said base cap being installed on and capable and quick of moving upward and downward along said front leg rod members and rear leg rod members.

* * * * *