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(54) **FOLDING TABLE WITH CROSSED LEGS**

(57) A folding table with crossed legs is provided. The table comprises a tabletop board, first leg shelf and second leg shelf. The two leg shelves support the tabletop board under the tabletop board. The two leg shelves also cross and pivot with each other at their central locations. The top of the first leg shelf is pivoted on the one side of the undersurface of the tabletop board. A fastening device is fixed on the other side of the undersurface of the tabletop board. A transverse supporting rod is fixed on

the top of the second leg shelf. The transverse supporting rod is fastened on the undersurface of the tabletop board by the fastening device. The top of the second leg shelf is not directly fixed on the undersurface of the tabletop board. When the table is unfolded, the undersurface of the tabletop board and the transverse supporting rod are fixed oppositely by the fastening device. When the table is folded, the transverse supporting rod is disengaged from the fastening device.

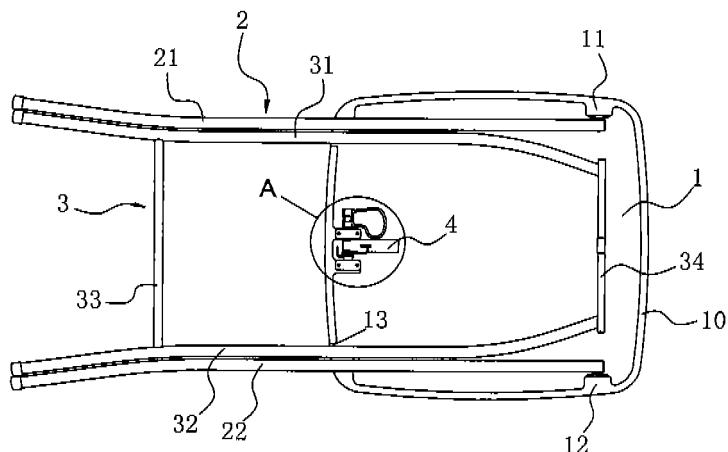


FIG. 1

**Description****Field of the Invention**

**[0001]** The invention concerns a folding table, specifically a folding table with crossed legs, which is stable in structure and easily folded.

**Background of Techniques**

**[0002]** Folding tables are frequently used on many occasions, like in offices or at homes. In offices, they can be employed for placement of some commonly-used small items, or as tea-tables, or for temporary placement of manuscripts, drawings and charts, pens, etc during discussions; at homes, they can be employed as work or study tables, or for placements of some daily-used small items. Therefore, as a conclusion, folding tables should be designed as small and handy, easily-folded and stored and easily-moved.

**[0003]** In order to save space while not being used, ordinary folding tables adopt crossed-leg structures, which mainly include two types: 1) table legs are fixed straightly on both sides of the bottom of table top by two table-leg brackets, which can be folded to the center of the table top and placed under the table top; 2) the table-leg bracket consists of intercrossed table legs, forming a foldable structure. In term of folding procedure, the aforementioned first structure is obviously less easy than the second one which is thus particularly suitable for temporary personal use.

**[0004]** Among the current folding structures of folding tables with crossed legs, since the top of intercrossed table-leg brackets are fixed to the bottom of table top, the brackets can only rotate relative to the table top but not move away from the top. Therefore, in order to be foldable, one of the brackets should be divided into two foldable parts, and a locking device should be fixed at the fold, so that it can lock the folding structure to be unfolded. These are some disadvantages concerning the aforementioned structures: 1) since one brackets is divided into two foldable parts, despite of the locking device for fixation, the stability of the table leg are greatly reduced when the bracket is unfolded; 2) some folding disorders easily appears at the fold of the table-leg bracket; 3) the folding procedure is not convenient.

**Description of the Invention**

**[0005]** The invention presents a folding table with crossed legs. The main purpose of the invention is to overcome the disadvantages of current folding tables with crossed legs, which include: instability of table-leg brackets, inconvenient folding procedure, and easily-occurred folding disorders at folds.

**[0006]** Following techniques are adopted: a folding table with crossed legs, which comprises: a table top, a first table-leg bracket, a second table-leg bracket; the

first and the second table-leg brackets are fixed under the table top as supporting frames, parts of both brackets are intercrossed and inter-jointed; the top of the first table-leg bracket is fixed on one side of the bottom of the table top, on the other side, a fastening device is equipped; on the top of the second table-leg bracket, a lateral supporting bar is set, which may be fixed under the bottom of the table top by the fastening device, and the top of the second table-leg bracket is not directly fixed to the bottom of the table top.

**[0007]** As the folding table is unfolded, the fastening device at the bottom of the table top helps parallelly fix the lateral supporting bar to the bottom of the table top.

**[0008]** As the folding table is folded, the fastening device at the bottom of the table top detaches from the lateral supporting bar at the top of the second table-leg bracket.

**[0009]** The aforementioned table top is a plastic composite board, reinforcing bars are buried within corners of its bottom to form a frame, and a located groove is set on the side of the frame where the fastening device is equipped.

**[0010]** The structure of the aforementioned fastening device includes: a clamping holder set at the bottom of the table top and a clamping piece; one end of the clamping piece is connected to the bottom of the table top by a connecting axis, where a spring is set to press the moving end of the clamping piece to the aforementioned clamping holder from bottom to top; the aforementioned lateral supporting bar may be pressed to and locked in the clamping holder, meanwhile, in the corresponding position of the table top, a reinforcing board is buried.

**[0011]** A spanner is fixed at the one end of the connecting axis of the clamping piece.

**[0012]** Two downwardly-projected connecting parts are formed at the bottom of the table top, the connecting axis of the aforementioned clamping piece is laid in between, and the aforementioned spring is set in the part of the connecting axis, which is located between two connecting parts; one of the extended end of the spring reaches the bottom of the table top, while the other end forms a hook, which is buckled from bottom to top into a catching groove set at the bottom of the clamping piece.

**[0013]** The structure of the aforementioned fastening device may also include: a fixing block, one end of which is connected to the bottom of the table top; on its connecting axis, a spring is fixed, which can press the moving end of the fixing block to the bottom of the table top, a fixing groove is set on one side of the fixing block, which faces the bottom of the table top, the aforementioned supporting bar is fixed between the fixing groove of the fixing block and the bottom of the table top.

**[0014]** A spanner is fixed at the one end of the connecting axis of the fixing block.

**[0015]** An inclined plane is formed at one side of the aforementioned block's moving end, the side which is close to the bottom of the table top.

**[0016]** Two downwardly-projected connecting parts

are formed at the bottom of the table top, the connecting axis of the aforementioned fixing block is laid in between, and the aforementioned spring is set in one part of the connecting axis, the part which is located between two connecting parts; one of the extending end of the spring is touched the bottom of the table top, while the other end forming a hook, which is buckled from bottom to top into a catching groove set at the bottom of the fixing block.

**[0017]** The aforementioned first table-leg bracket comprises two table legs and a reinforcing bar fixed between the lower parts of both legs for connection, the bottom edges of the table top are extended downwardly to form a frame, one of whose sides is stretched inwardly to form two connecting parts, to which the tops of the aforementioned two legs are jointed respectively; a second table-leg bracket comprises two table legs and a reinforcing bar fixed between the lower parts of both legs for connection, the aforementioned lateral supporting bar is fixed between the tops of both legs for connection.

**[0018]** The shape of the aforementioned table top may be among rounds, squares, and rectangles; the table top is a composite structure, whose outer layer is a plastic-suction board while reinforcing bars are buried inside and honeycomb paper cores are stuffed in the rest parts.

**[0019]** The width of the aforementioned second table-leg bracket is less than that of the aforementioned first table-leg bracket, and the second table-leg bracket is equipped at the inner side of the first table-leg bracket.

**[0020]** It could be concluded from the aforementioned descriptions that, comparing with current techniques, the invention has following advantages: 1) unlike conventional table-leg brackets which comprise two foldable parts, both table-leg brackets are as integral forms, firm and steady, thus the folding table is more stably supported; 2) the folding procedure of table-leg brackets is realized by detachment of the top of one table-leg bracket from the bottom of the table top, so that the process is easier and more smooth, and free from folding disorders; 3) since the table top adopts the plastic composite structure, and has reinforcing bars buried inside, the strength of the table top is increased, besides, it makes a simpler structure by integrating connecting parts and other structures with the bottom plate of the table top.

#### Brief Description of the attached drawings

#### **[0021]**

Figure 1 is an upward view showing the folding status of Implement Example 1 of the invention.

Figure 2 is a side view showing the unfolding status of Implement Example 1 of the invention.

Figure 3 is a partial enlarged view showing Part A in Figure 1.

Figure 4 is a partial enlarged view showing Part B in

Figure 2, i.e. a partial longitudinal profile of the buckle device in Implement Example 1.

Figure 5 is an upward view showing the folding status of concrete implement Example 2 of the invention.

Figure 6 is a partial longitudinal profile of the buckle device in Implement Example 2.

#### 10 Implement Examples

**[0022]** As shown from Figure 1 to Figure 4, the detailed description of the Implement Example 1 is as follow: the folding table with crossed legs in the Example comprises a table top 1, a first table-leg bracket 2 and a second table-leg bracket 3; bracket 2 and 3 are fixed at the bottom of table top for support, parts of both brackets are intercrossed and interconnected. The table top takes an approximately square-like shape; the outer layer of table top 1 is a plastic-suction board 15 and its core is the honeycomb paper core 16, a reinforcing pipe-fitting 14 is equipped on the lower parts of its edge and covered and fixed by plastic-suction board 15, so that the edges of table top 1 are extended downwardly to form a edge

frame 10, two parallel edges of which are stretched inwardly to form two connecting parts 11 & 12. The first table-leg bracket comprises two table legs 21 & 22, and the reinforcing bar 23 fixed between the lower parts of both legs for connection. The tops of both legs 21 & 22 are jointed respectively to the connecting parts 11 & 12.

**[0023]** At the bottom of table top 1, two downwardly-projected connecting parts 101 & 102 are formed on another side. A clamping piece 4 is fixed between the connecting parts 101 & 102 through a connecting axis 41; a spring is fixed on one part of the axis which is laid between the connecting parts 101 & 102. One extended end 51 of the spring 5 reaches the bottom of table top 1, while the other end 52 forms a hook, which is buckled from bottom to top into a catching groove 40 set at the bottom of the clamping piece 4. Thus the spring can press the clamping piece 4 tightly to table top 1; meanwhile, in the corresponding position of the table top, a reinforcing board 17 is buried to enhance the strength of the bottom board.

**[0024]** A clamping holder 44 is set at the bottom of the table top, whose mouth faces downwardly, the clamping piece 4 touches alongside the bottom of the neck 44 from bottom to top; the second table-leg bracket 3 comprises two table legs 31 & 32 and a reinforcing bar 33 fixed between the lower parts of both legs for connection, a lateral supporting bar 34 is fixed between the tops of both legs, which can also be laid within the aforementioned neck 44 and pressed by the clamping piece 4 to be fixed at the bottom of table top 1. As the supporting bar 34 is pressed to and fixed within the neck 44 by the clamping piece 4 at the bottom of table top 1, the first table-leg bracket 2 and the second table-leg bracket 3 can steadily support the table top 1 levelly to reach certain height, as

shown in Figure 2.

**[0025]** A spanner 42 is fixed at the one extended end of the connecting axis 41 of the clamping piece 4, through which the connecting axis can rotate to press the moving end of the clamping piece 4 downwardly, so that the lateral supporting bar 34 of the second table-leg bracket 3 can be detached from clamping holder 44; the first table-leg bracket 2 may roll directly downwardly to the bottom of the table top, which drives the top of the second table-leg bracket 3 to roll upwardly to the bottom of the table top; the legs are extended out through located groove 13 fixed on the edge frame 10, and folded as the status shown in Figure 1. It is can be concluded that the two table-leg brackets 2 & 3 themselves are as integral forms, which are not foldable, so that them can give firm and steady supports, while the folding procedure is realized by detachment of lateral supporting bar 34 on top of the second table-leg bracket 3 from the bottom of the table top 1, so that folding disorders are unlikely to appear.

**[0026]** As shown in Figure 5 & 6, the folding table with crossed legs in the Implement Example 2 comprises a table top 1, a first table-leg bracket 2 and a second table-leg bracket 3; bracket 2 and 3 are fixed at the bottom of table top 1 for support, parts of both brackets are intercrossed and interconnected. The table top takes an round shape; the outer layer of the table top 1 is a plastic-suction board 15 and its core is the honeycomb paper core 16, a reinforcing pipe-fitting 14 is equipped on the lower parts of its edge and covered and fixed by plastic-suction board 15, so that the edges of the table top 1 are extended downwardly to form a edge frame 10, two parallel edges of which are stretched inwardly to form two connecting parts 11 & 12. The first table-leg bracket comprises two table legs 21 & 22, and the reinforcing bar 23 fixed between the lower parts of both legs for connection. The tops of both legs 21 & 22 are jointed respectively to the connecting parts 11 & 12.

**[0027]** At the bottom of table top 1, two downwardly-projected connecting parts 101 & 102 are formed on another side while a reinforcing board 17 is buried within the bottom of the table top; a fixing block 6 is fixed between the connecting parts 101 & 102 through a connecting axis 41, a spring is fixed on one part of the axis which is laid between the connecting parts 101 & 102. One extended end 51 of the spring 5 reaches the bottom of table top 1, while the other end 52 forms a hook, which is buckled from bottom to top into a catching groove 60 set at the bottom of the fixing block 6. Thus the spring can press the fixing block 6 to the bottom of table top 1; meanwhile, since a reinforcing board 17 is buried at its bottom, the strength of the table top 1 is enhanced.

**[0028]** A fixing groove 65 is set on the side of the fixing block 6, which faces the bottom of the table top 1; the second table-leg bracket 3 comprises two table legs 31 & 32 and a reinforcing bar 33 fixed between the lower parts of both legs for connection, a lateral supporting bar 34 is fixed between the tops of both legs, which can also be laid within the aforementioned fixing groove 65 of the

blocking block 6, and fixed at the bottom of the table top 1. As the supporting bar 34 is pressed to and fixed at the bottom of the table top 1 by the fixing groove 65 of the fixing block 6, the first table-leg bracket 2 and the second table-leg bracket 3 can steadily support the table top 1 levelly to reach certain height, as shown in Figure 2.

**[0029]** A spanner 42 is fixed at the one extended end of the connecting axis 41 of the fixing block 6, through which the connecting axis can rotate to press the moving end of the fixing block 6 downwardly, so that the lateral supporting bar 34 of the second table-leg bracket 3 can be detached from the fixing groove 65 of the fixing block 6, thus a folded status as shown in Figure 1 is formed. It is can be concluded that the two table-leg brackets 2 & 3 themselves are as integral forms, which are not foldable, so that them can give firm and steady supports, while the folding procedure is realized by detachment of lateral supporting bar 34 on top of the second table-leg bracket 3 from the bottom of the table top 1, so that folding disorders are unlikely to appear.

**[0030]** The moving end of the aforementioned fixing block 6 touches one side of the bottom of the table top 1 to form a inclined plane 63, which facilitates the attachment and detachment of the lateral supporting bar to or from the fixing groove 65 of the fixing block 6, so that the folding procedure becomes more smooth. What are presented above are only two concrete implement examples, not covering the whole design and conception, any unessential alterations or modifications to the invention by adopting the conception should be defined as violations against protection scopes of the invention.

#### INDUSTRIAL APPLICABILITY

**[0031]** This invention relates to a folding table with crossed legs, the structure of which is simple, while the fixing procedure is easy, thus it is convenient for use. The manufacture of each accessories and components can meet the demand of mass industrial production, thus is of high industrial applicability.

#### **Claims**

- 45 1. A folding table with cross legs comprises a table top, a first table-leg bracket, a second table-leg bracket; the first and the second table-leg brackets are fixed under the table top as supporting frames, parts of both brackets are intercrossed and inter-jointed; the features include: the top of the first table-leg bracket is fixed on one side of the bottom of the table top, on the other side, a fastening device is equipped; on the top of the second table-leg bracket, a lateral supporting bar is set, which may be fixed under the bottom of the table top by the fastening device, and the top of the second table-leg bracket is not directly fixed to the bottom of the table top;

As the folding table is unfolded, the fastening device at the bottom of the table top helps parallelly fix the lateral supporting bar to the bottom of the table top.

As the folding table is folded, the fastening device at the bottom of the table top detaches from the lateral supporting bar at the top of the second table-leg bracket.

2. As described in claim 1, a folding table with crossed legs, whose features are: the aforementioned table top is a plastic composite board, reinforcing bars are buried within corners of its bottom to form a frame, and a located groove is set on the side of the frame where a fastening device is equipped.
3. As described in claims 1 or 2, a folding table with crossed legs, whose features are: the structure of the aforementioned fastening device includes: a clamping holder set at the bottom of the table top and a clamping piece; one end of the clamping piece is connected to the bottom of the table top by a connecting axis, where a spring is set to press the moving end of the clamping piece to the aforementioned clamping holder from bottom to top; the aforementioned lateral supporting bar may be pressed to and locked in the clamping holder, meanwhile, in the corresponding position of the table top, a reinforcing board is buried.
4. As described in claim 3, a folding table with crossed legs, whose feature is: a spanner is fixed at the one end of the connecting axis of the clamping piece.
5. As described in claim 3, a folding table with crossed legs, whose features are: two downwardly-projected connecting parts are formed at the bottom of the table top, the connecting axis of the aforementioned clamping piece is laid in between, and the aforementioned spring is set in the part of the connecting axis, which is located between two connecting parts; one of the extended end of the spring reaches the bottom of the table top, while the other end forms a hook, which is buckled from bottom to top into a catching groove set at the bottom of the clamping piece.
6. As described in claims 1 or 2, a folding table with crossed legs, whose features are: the structure of the aforementioned fastening device includes a fixing block, one end of which is connected to the bottom of the table top; on its connecting axis, a spring is fixed, which can press the moving end of the fixing block to the bottom of the table top, a fixing groove is set on one side of the fixing block, which faces the bottom of the table top, the aforementioned supporting bar is fixed between the fixing groove of the fixing block and the bottom of the table top.

7. As described in claim 6, a folding table with crossed legs, whose feature is: a spanner is fixed at the one end of the connecting axis of the fixing block.

- 5 8. As described in claim 6, a folding table with crossed legs, whose feature is: an inclined plane is formed at one side of the aforementioned block's moving end, the side which is close to the bottom of the table top.
- 10 9. As described in claim 6, a folding table with crossed legs, whose features are: two downwardly-projected connecting parts are formed at the bottom of the table top, the connecting axis of the aforementioned fixing block is laid in between, and the aforementioned spring is set in one part of the connecting axis, the part which is located between two connecting parts; one of the extending end of the spring is touched the bottom of the table top, while the other end forming a hook, which is buckled from bottom to top into a catching groove set at the bottom of the fixing block.
- 15 10. As described in claim 1, a folding table with crossed legs, whose features are: the aforementioned first table-leg bracket comprises two table legs and a reinforcing bar fixed between the lower parts of both legs for connection, the bottom edges of the table top are extended downwardly to form a frame, one of whose sides is stretched inwardly to form two connecting parts, to which the tops of the aforementioned two legs are jointed respectively; a second table-leg bracket comprises two table legs and a reinforcing bar fixed between the lower parts of both legs for connection, the aforementioned lateral supporting bar is fixed between the tops of both legs for connection.
- 20 11. As described in claim 1, a folding table with crossed legs, whose features are: the shape of the aforementioned table top may be among rounds, squares, and rectangles; the table top is a composite structure, whose outer layer is a plastic-suction board while reinforcing bars are buried inside and honeycomb paper cores are stuffed in the rest parts.
- 25 12. As described in claim 1, a folding table with crossed legs, whose features are: the width of the aforementioned second table-leg bracket is less than that of the aforementioned first table-leg bracket, and the second table-leg bracket is equipped on the inner side of the first table-leg bracket.
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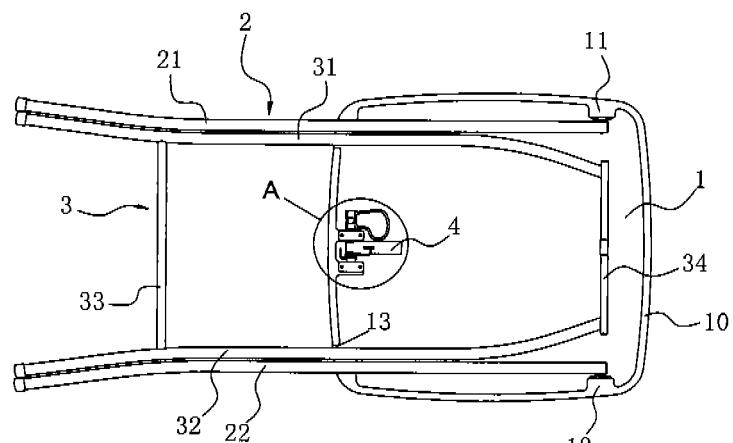


FIG. 1

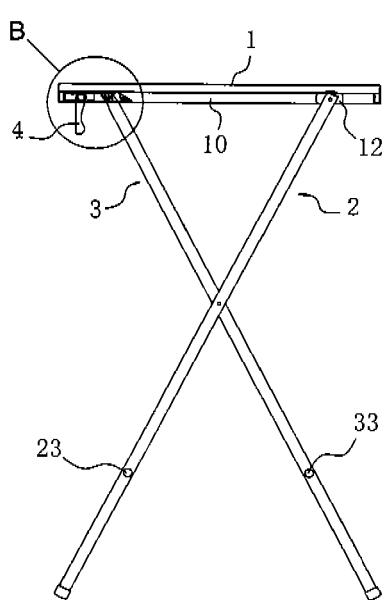


FIG. 2

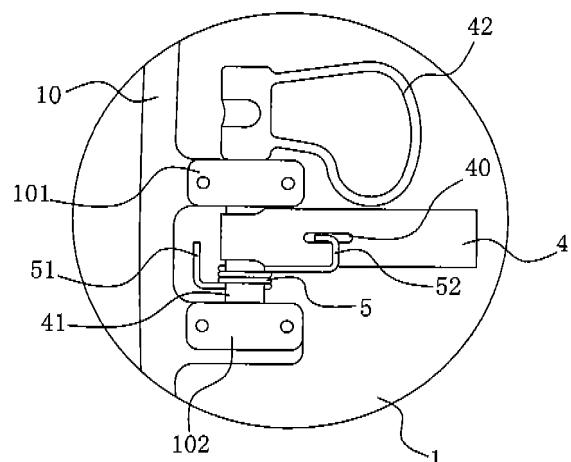


FIG. 3

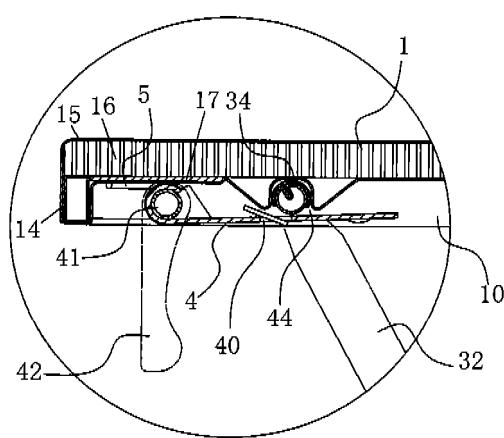


FIG. 4

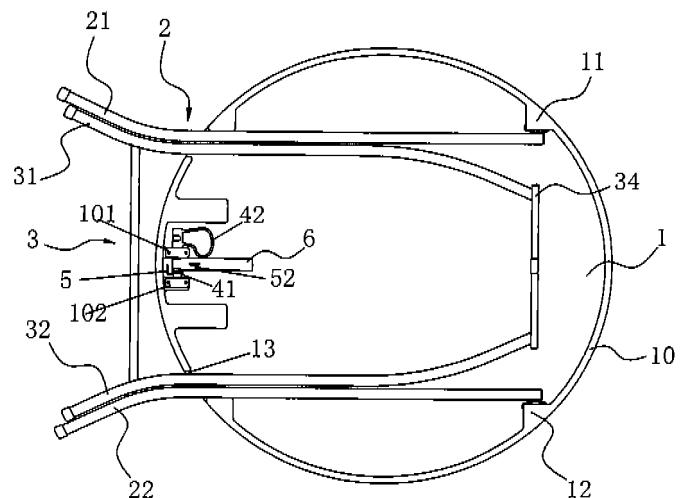


FIG. 5

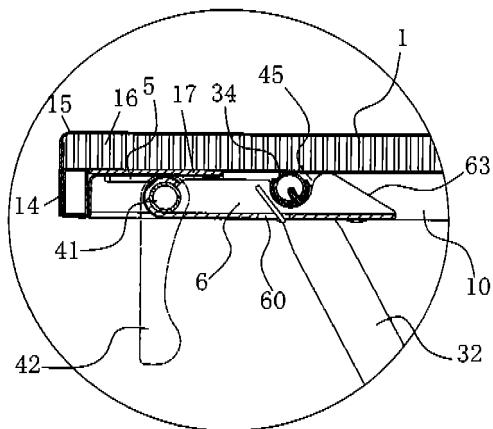


FIG. 6

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/CN2006/000070

## A. CLASSIFICATION OF SUBJECT MATTER

A47B3/02 (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)

A47B (2006.01) A47C (2006.01)

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

China patent documentation (1985~ )

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

CNPAT WPI PAJ EPODOC: leg+ foot feet fold+ tabl+ desk+ chair+ press+ lock+ fasten+ pivot+ cross+ intersect+ secur+ fix+ disengag+

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN , Y , 2659220 (LENG, Luhao) 01.DEC.2004 (01.12.2004) description page 4-page 6, fig.1-fig.5	1-5, 10-12
X	CN, Y, 2648898 (LENG, Luhao) 20.OCT.2004 (20.10.2004) description page 4-page 6, fig.1-fig.6	1-2, 6-12
A	JP, A, 8-140742 (TAKA-N) 04.JUN.1996 (04.06.1996) the whole document	1-12
A	US, B1, 6314893 (LEEW-I) 13.NOV.2001 (13.11.2001) the whole document	1-12

 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
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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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	

Date of the actual completion of the international search 12.APR.2006 (12.04.2006)	Date of mailing of the international search report 04 · MAY 2006 (04 · 05 · 2006)
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Form PCT/ISA /210 (second sheet) (April 2005)

**INTERNATIONAL SEARCH REPORT**  
Information on patent family membersInternational application No.  
PCT/CN2006/000070

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CN , Y , 2659220	01.12.2004	none	
CN, Y, 2648898	20.10.2004	none	
JP, A, 8-140742	04.06.1996	none	
US, B1, 6314893	13.11.2001	none	

Form PCT/ISA/210 (patent family annex) (April 2005)