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(54) PLATE TENSIONING SHELF

(57) A removable plate tensioning shelf for accommodating articles includes two lateral racks (1) and several plates (2) mounted between the racks (1). It is provided a plurality of grooves (4) engaging with the surface configuration of the pillars (3) of the racks (1) from respective corner on each connecting side of the plates (2) and the racks (1). The grooves (4) can surround pillars (3) firmly and make plates (2) tension firmly in the racks (1) when the plates (2) are mounted in the racks (1). It is allowed to adjust the width of ' the racks (1) at any moment and add additional support racks between the racks (1).

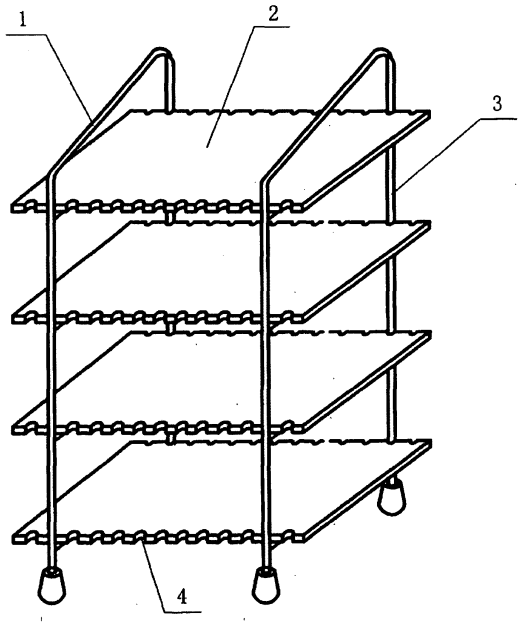

FIG. 5

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Description

TECHNICAL FIELD

[0001] The present invention relates to a plate tensioning shelf, and in particular to a removable plate tensioning shelf for accommodating articles.

BACKGROUND OF THE INVENTION

[0002] Normally, a tensioning shelf mainly comprises two lateral racks and several plates mounted between two lateral racks. The plates are fixed by Y-shaped joints which are welded to the plates and tighten the pillars of two lateral racks. This shelf's structure is complicated, and its manufacture is also inconvenient. During assembly, the distance between two lateral racks can not be adjusted at will, and it is also not allowed to add additional support racks to the shelf to enhance the weight-carrying capability of the plates. Thus, the integrity of the plates for a wider shelf is not enough to carry heavy weight. Therefore, the size and weight-carrying capability of the shelf are limited.

SUMMARY OF THE INVENTION

[0003] Having outlined the state of the prior art and its disadvantages, it is an objective of the present invention to provide a plate tensioning shelf with simple structure, and wherein it is allowed to adjust the width of the plate tensioning shelf at any moment and add additional support racks to the shelf to enhance the weight-carrying capability. Furthermore, a plurality of shelves can be joined with each other.

[0004] The above objective of the present invention is achieved by the following technical solutions:

[0005] A plate tensioning shelf comprises two lateral racks and plates mounted between the racks. A plurality of grooves for engaging with the surface configuration of the pillars of the lateral racks are provided from corners of both sides of each of the plates. The grooves hold the pillars firmly and tighten the plates firmly in the racks when the plates are mounted in the racks.

[0006] Preferably, small crown-shaped protrusions are further provided in the grooves of the plates, and recesses corresponding to the protrusions are provided on the pillars. The protrusion is of a size adapted to be completely contained in the recess, and as a result, the plates are self-locked.

[0007] Preferably, the plate may be a plastic plate. The plastic plates can further facilitate the fastening and will not cause the surface damage of the pillars because of the better elasticity of the plastic plate.

[0008] With the above-described technical solutions, the present invention has the following advantages:

[0009] By providing grooves corresponding to the configuration of the pillars of the racks, the pillars can be firmly surrounded by the grooves to tighten the plates. The grooves may also be arranged in a serrated manner, and hence it enables distance adjustment between two lateral racks at any moment during assembly, and it is also allowed to add other support racks to the shelf to enhance its weight-carrying capability. Thus, it is possible to mount a wider shelf or to join several shelves together to improve its weight-carrying capability. Therefore, the structure of the present invention is simple, and it is allowed to adjust the width at any moment. It is also possible to add additional support racks to the shelf. Moreover, a plurality of shelves can be joined together. The carrying capability is enhanced accordingly. Furthermore, the shelf may be triangular sector-shaped; thus it can be assembled to be cylindrical or S-shaped by joining several triangular sector-shaped shelves together, which is more convenient and good-looking.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

Fig. 1 is a schematic view showing a plate tensioning shelf;

Fig. 2 is a schematic view the plate tensioning shelf as shown in Fig.1 before assembly;

Fig. 3 is a schematic view showing a plate tensioning shelf without additional grooves for engaging with the pillars;

Fig. 4 is a schematic view showing a plate tensioning shelf with a plurality of grooves for engaging with the pillars;

Fig. 5 is a perspective assembly view of a plate tensioning shelf with plates having a plurality of grooves;

Fig. 6 is a perspective view of a plate tensioning shelf with additional support racks between the lateral racks;

Fig. 7 is a schematic view showing a plate engaging with a pillar when the pillar is a cylindrical post;

Fig. 8 is a schematic view showing a plate engaging with a pillar when the pillar is a rectangular post;

Fig. 9 is a schematic view showing a plate engaging with a pillar when the pillar is a double-cylindrical post;

Fig. 10 is a schematic view showing a plate engaging with a pillar when the pillar is a connected double-rectangular post;

Fig. 11 is a schematic view showing a plate engaging with a pillar when the pillar is a hollow and double-

rectangular post;

Fig. 12 is a schematic sectional view showing a plate engaging with a pillar when the pillar is a cylindrical post and a small crown-shaped protrusion is formed in the groove of the plate;

Fig. 13 is a schematic sectional view showing a plate engaging with a pillar when the pillar is a rectangular post and small crown-shaped protrusions are formed in the groove of the plate;

Fig. 14 is a schematic sectional view showing a plate engaging with a pillar when the pillar is a double-cylindrical post and small crown-shaped protrusions are formed in the grooves of the plate;

Fig. 15 is a perspective assembly view showing a plate tensioning shelf which is of triangular sector-shaped plates;

Fig. 16 is an exploded view showing a plate tensioning shelf which is of triangular sector-shaped plates;

DETAILED DESCRIPTION OF THE INVENTION

[0011] The present invention will be further described in the following embodiments with reference to the accompanying drawings.

[0012] Referring to Figs. 1 to 16, a plate tensioning shelf comprises: two lateral racks 1 and several plates 2 mounted between the racks 1. A plurality of grooves 4 for engaging with the surface configuration of the pillars 3 of the racks 1 are provided on both sides of each of the plates 2 from corners thereof. The grooves 4 hold pillars 3 firmly and tighten the plates 2 firmly in the racks 1 when the plates 2 are mounted in the racks 1.

[0013] The pillar 3 of the rack 1 may be a cylindrical, rectangular, hexagonal, double-cylindrical, double-rectangular, double-rectangular and hollow, or double-hexagonal post. All of these configurations are within the scope of the invention. According to the integrity required, single or double pillars may be provided. The grooves 4 of the plates 2 are semi-circular, semi-square or semi-hexagonal. The number of the grooves 4 is arranged according to the manner of use, with at least one groove being arranged on each of the four corners, and at most grooves being arranged on the entire front and back sides. Thus, it is allowed to set the distance between two lateral racks 1 flexibly, or add additional support racks between the two lateral racks, and it is also allowed to connect two or more shelves together by using the plates 2.

[0014] The configuration of the pillars and the arrangement of the grooves are not limited to the forms as described.

[0015] Referring to Figs. 12 to 14, small crown-shaped protrusions 5 are provided in the grooves 4 of the plates 2, and recesses 6 corresponding to the protrusions 5 are provided on the pillars 3. The protrusion 5 is of a size adapted to be completely contained in the recess 6, and as a result, the plates 2 are self-locked and will not become loose easily.

[0016] Referring to Figs. 15 and 16, the shelf of the present invention may be triangular sector-shaped. It can be assembled into cylindrical or S-shaped shelf by joining several triangular sector-shaped shelves together, which is more convenient and good-looking.

[0017] Preferably, the plates are made of plastic. The plates with grooves are manufactured by one-step forming process. For the good elasticity, the plates can further facilitate the fastening and will not cause pillars surface damage. Meanwhile, the cost is also reduced.

[0018] Therefore, the structure of the present invention is simple. It is allowed to adjust the width at any moment and add support racks to racks to enhance the carry capability.

Claims

1. A plate tensioning shelf, comprising:

   two lateral racks (1) having pillars (3); and plates (2) mounted between the lateral racks (1); **characterized in that** a plurality of grooves (4) for engaging with the surface configuration of the pillars (3) of the lateral racks (1) are provided on both sides of each of the plates (2) from corners thereof, the grooves (4) hold the pillars (3) tightly and tighten the plates (2) in the lateral racks (1) when the plates (2) are mounted on the lateral racks (1).

2. The plate tensioning shelf of claim 1, **characterized in that** small crown-shaped protrusions (5) are provided in the grooves (4) of the plates (2), and recesses (6) corresponding to the protrusions (5) are provided on the pillars (3), and each of the protrusions (5) is of a size adapted to be completely contained in the recess (6) to enable the plates (2) to be self-locked.

3. The plate tensioning shelf of claim 1, **characterized in that** the plates (2) are plastic plates.

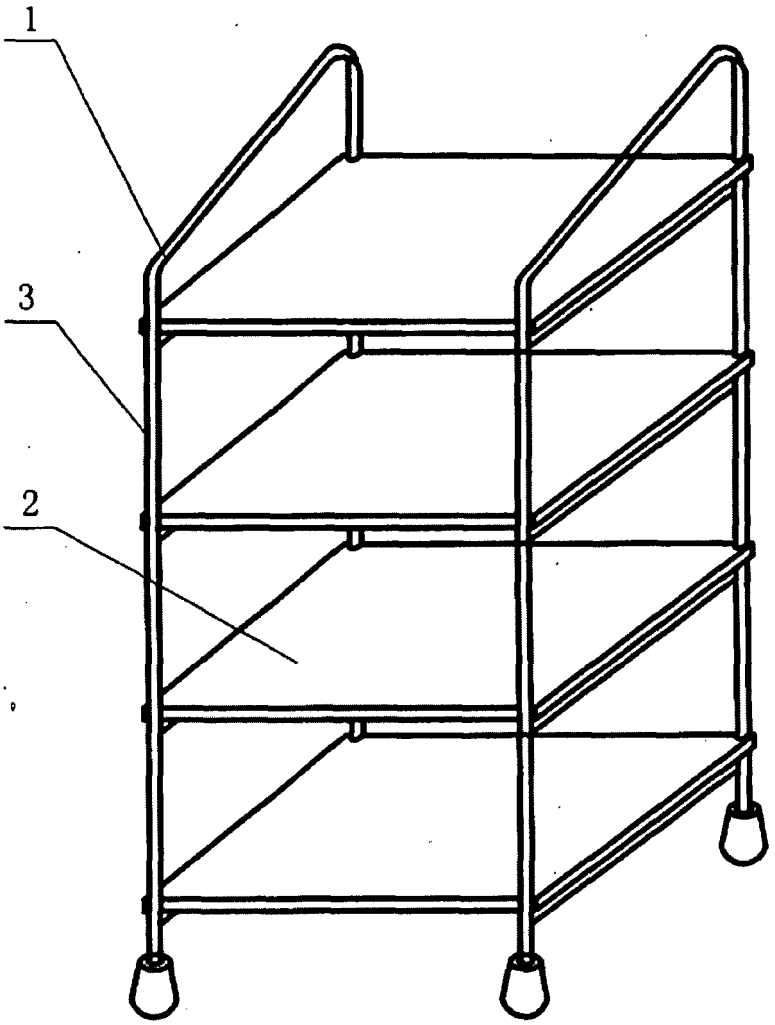

FIG. 1

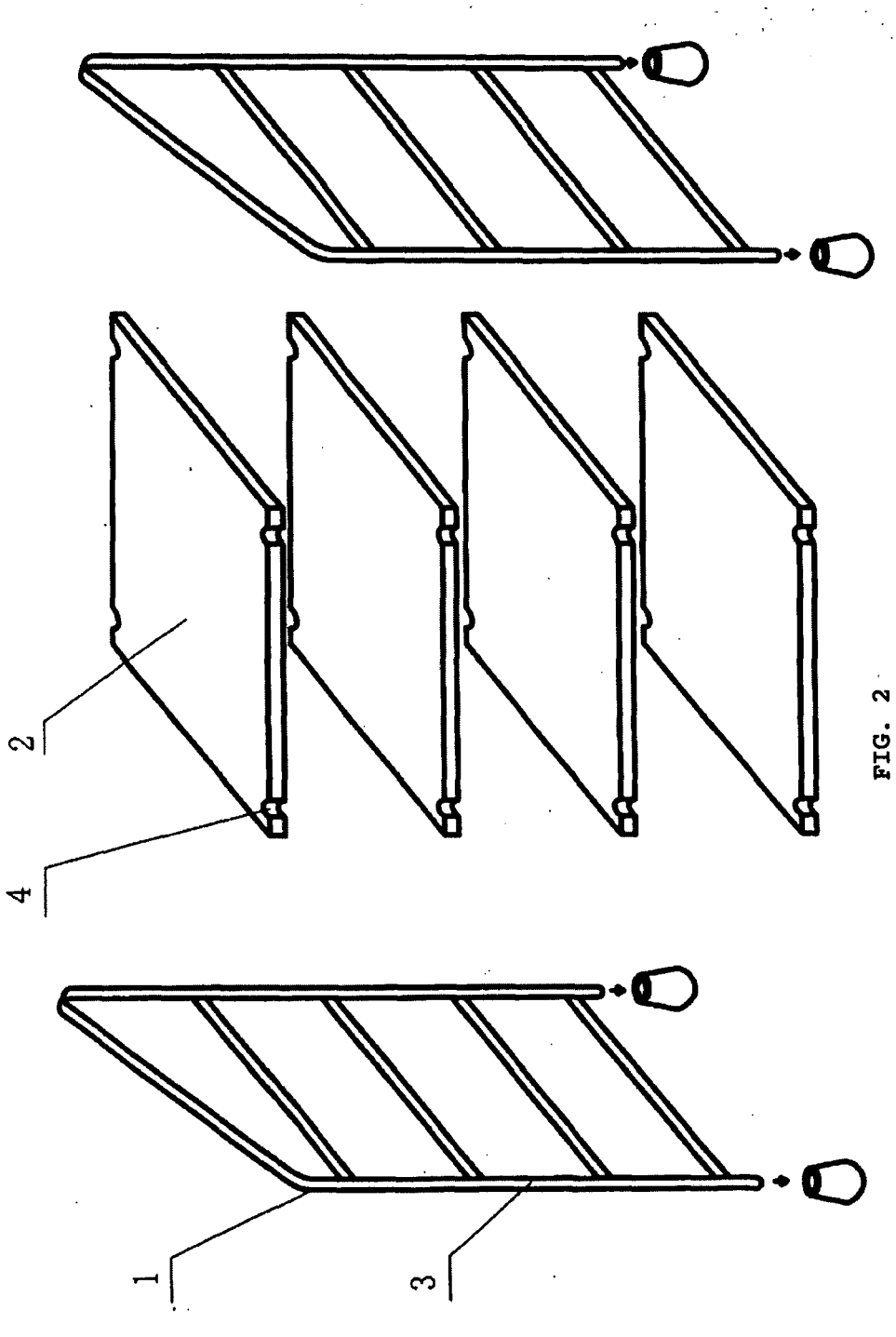

FIG. 2

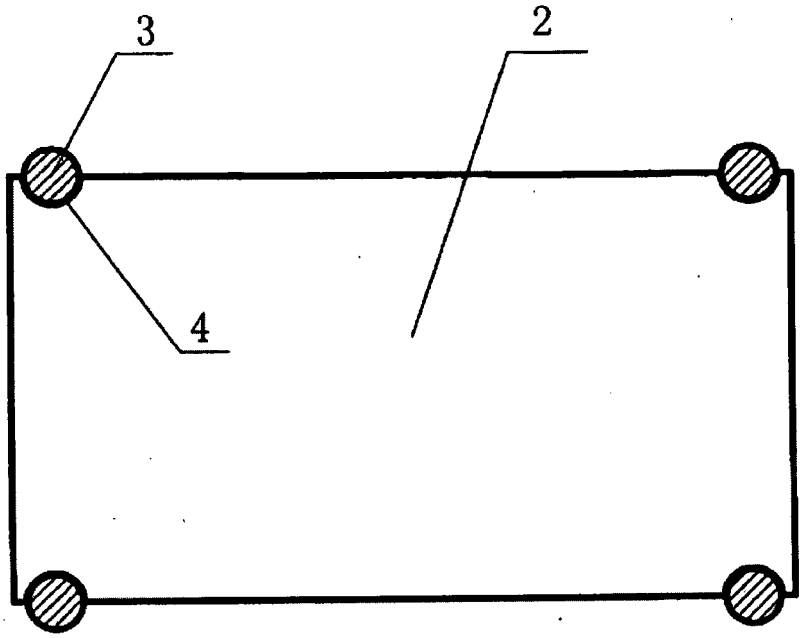

FIG. 3

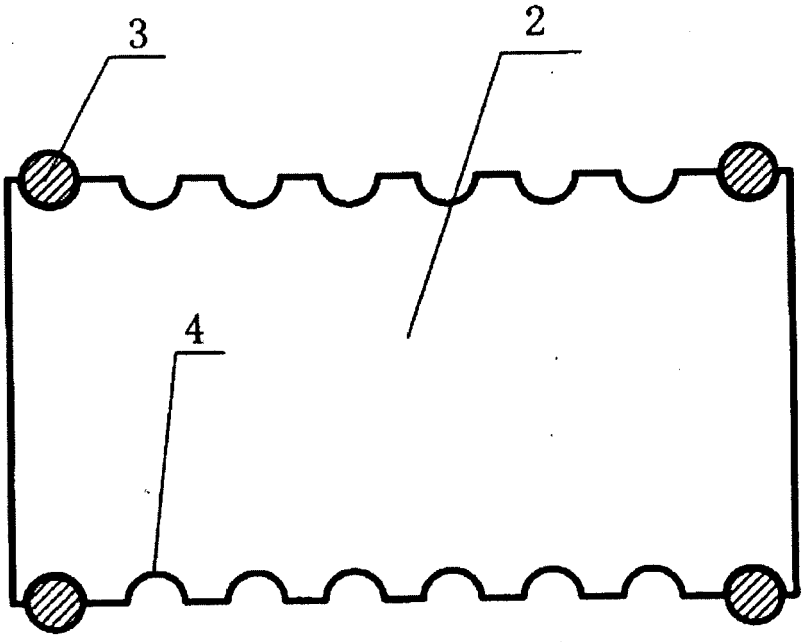

FIG. 4

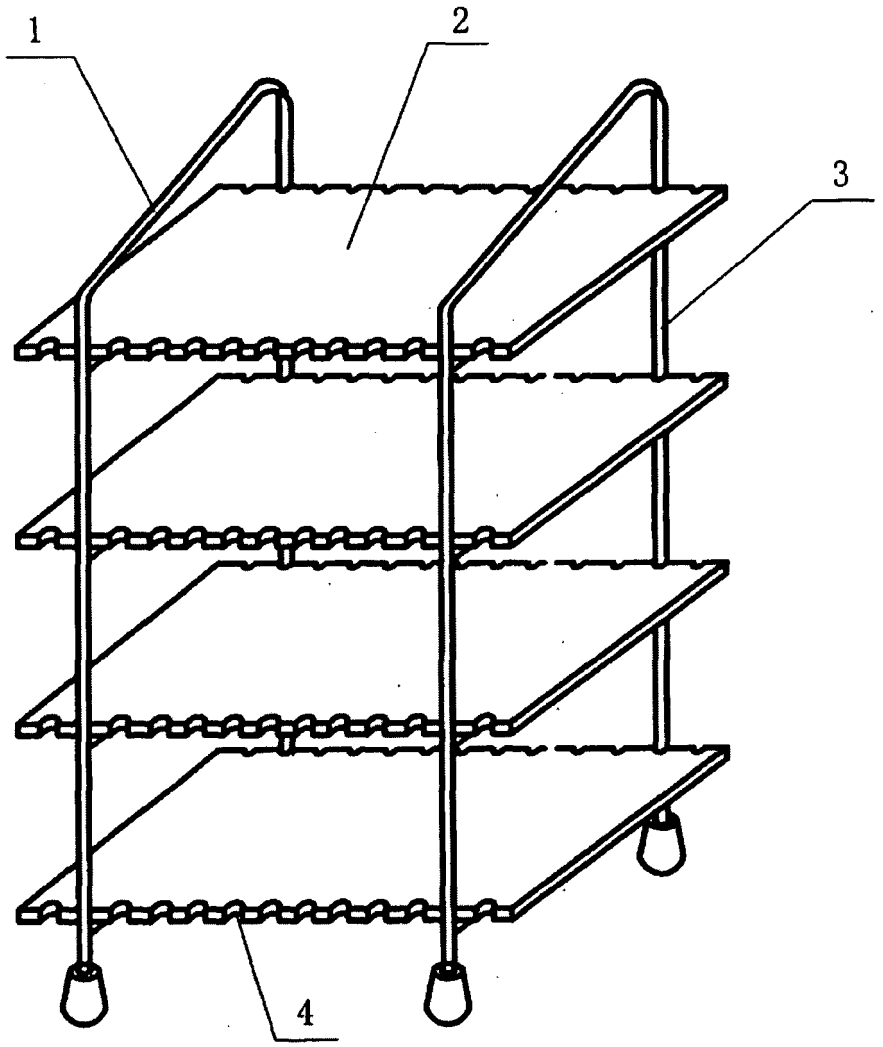

FIG. 5

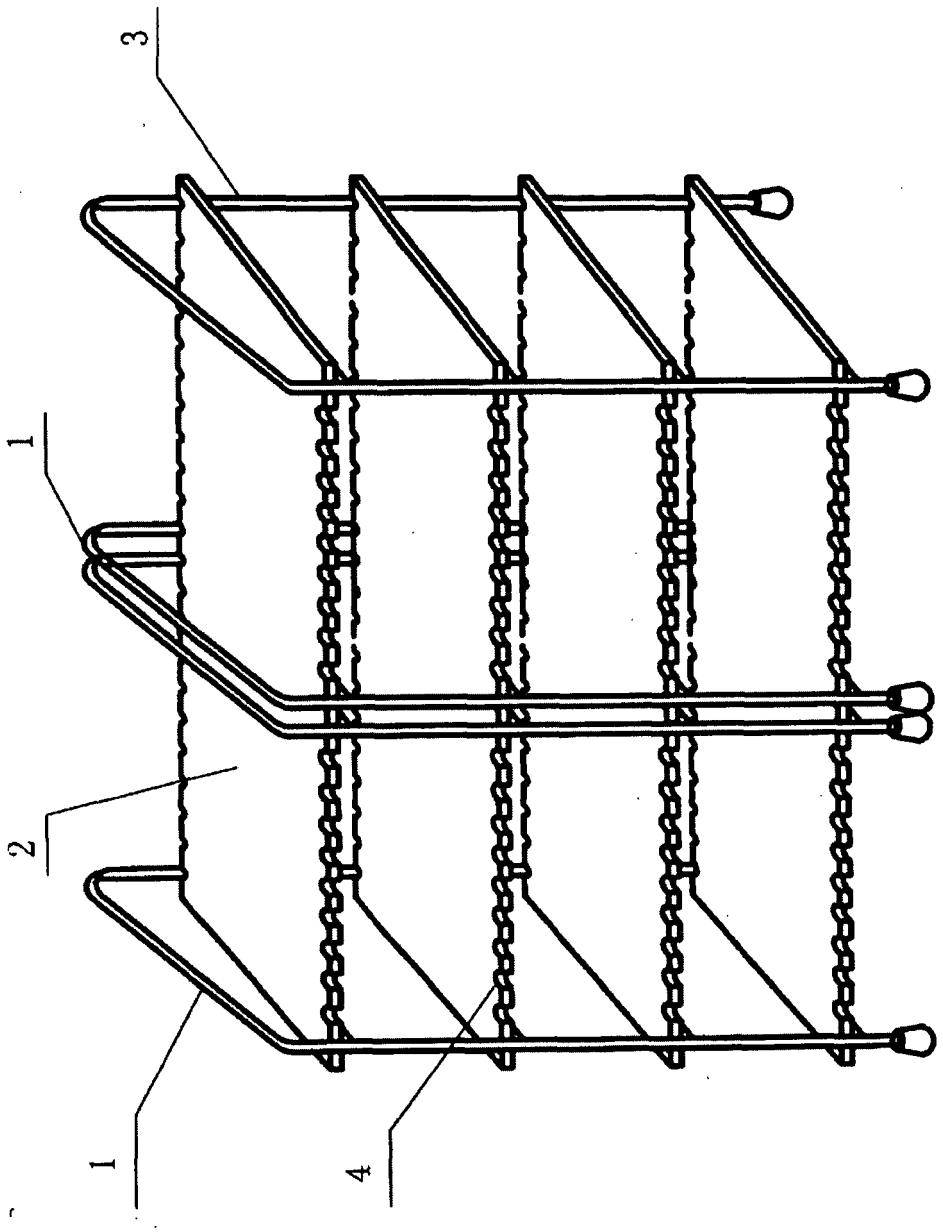

FIG. 6

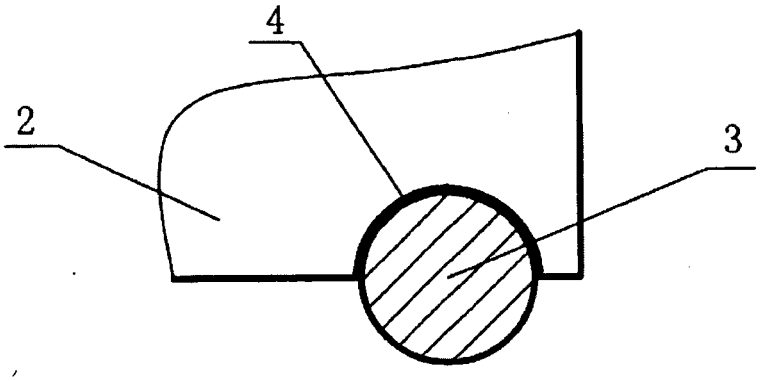

FIG. 7

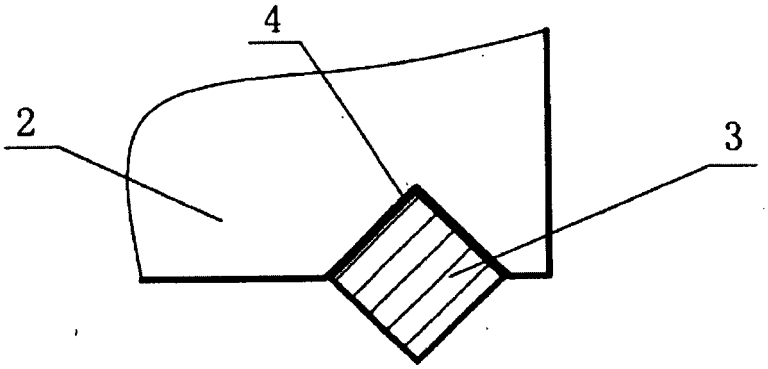

FIG. 8

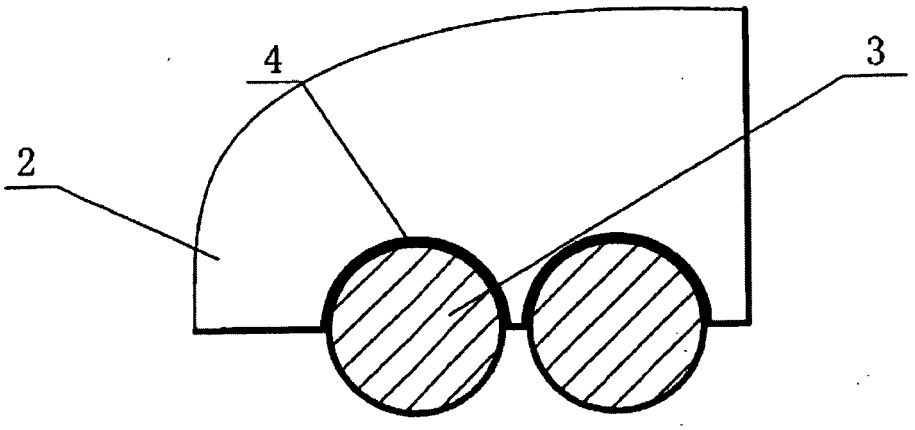

FIG. 9

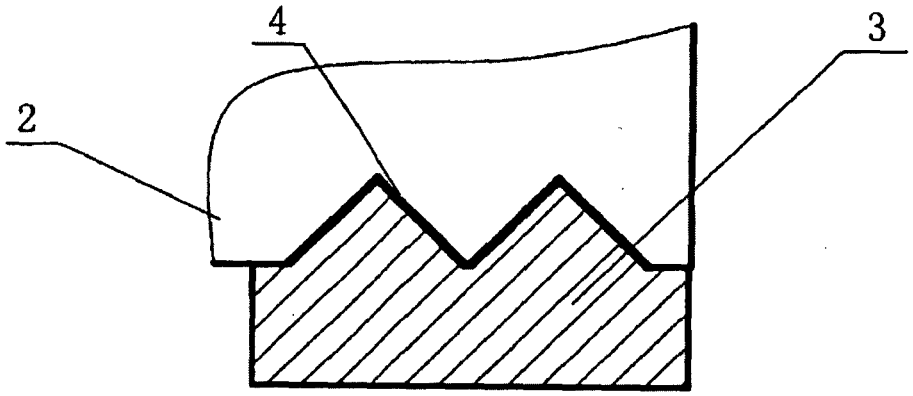

FIG. 10

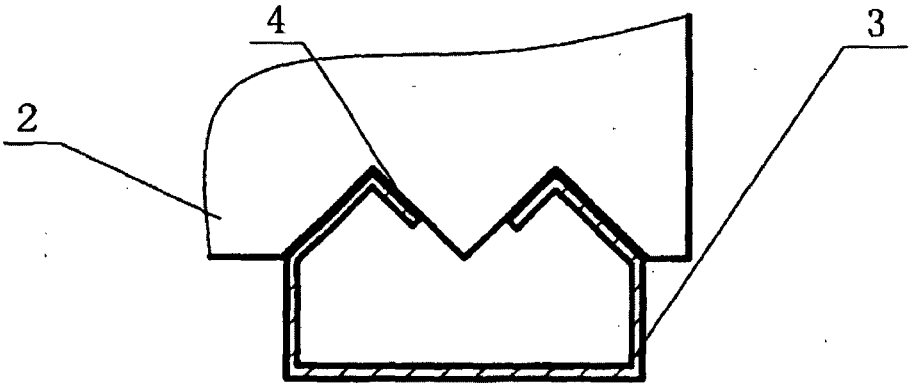

FIG. 11

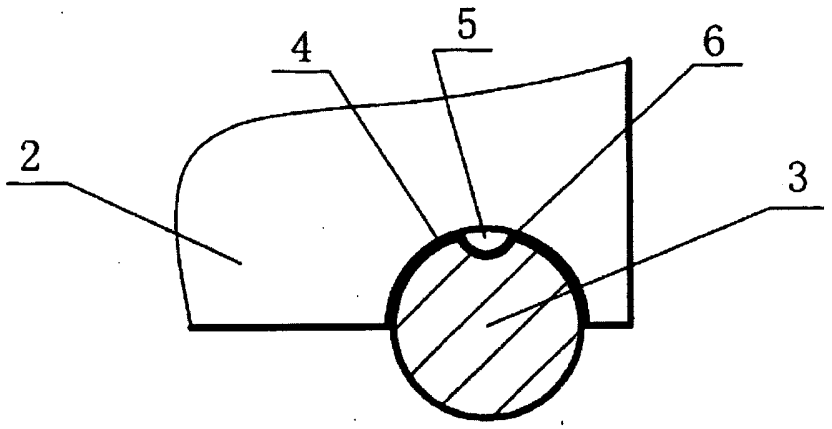

FIG. 12

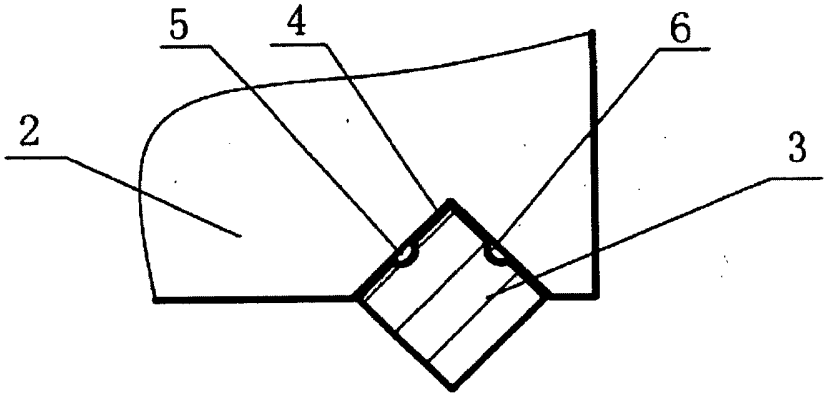

FIG. 13

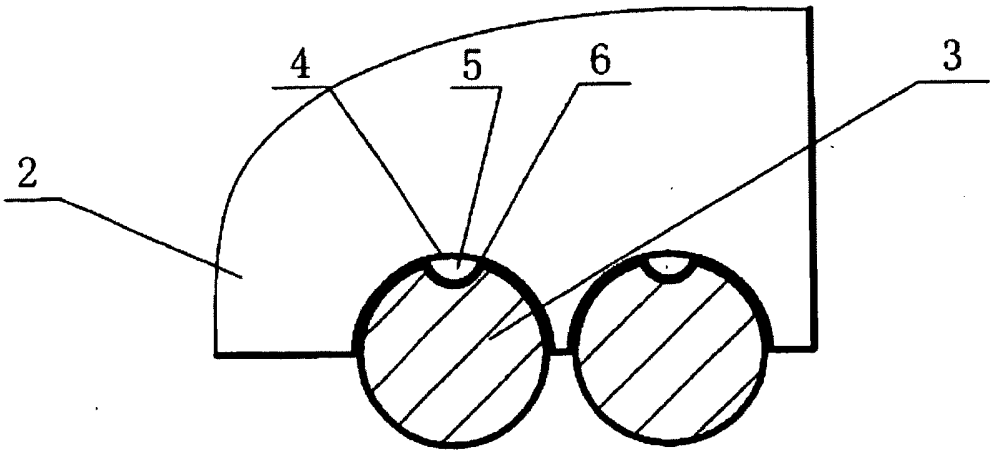

FIG. 14

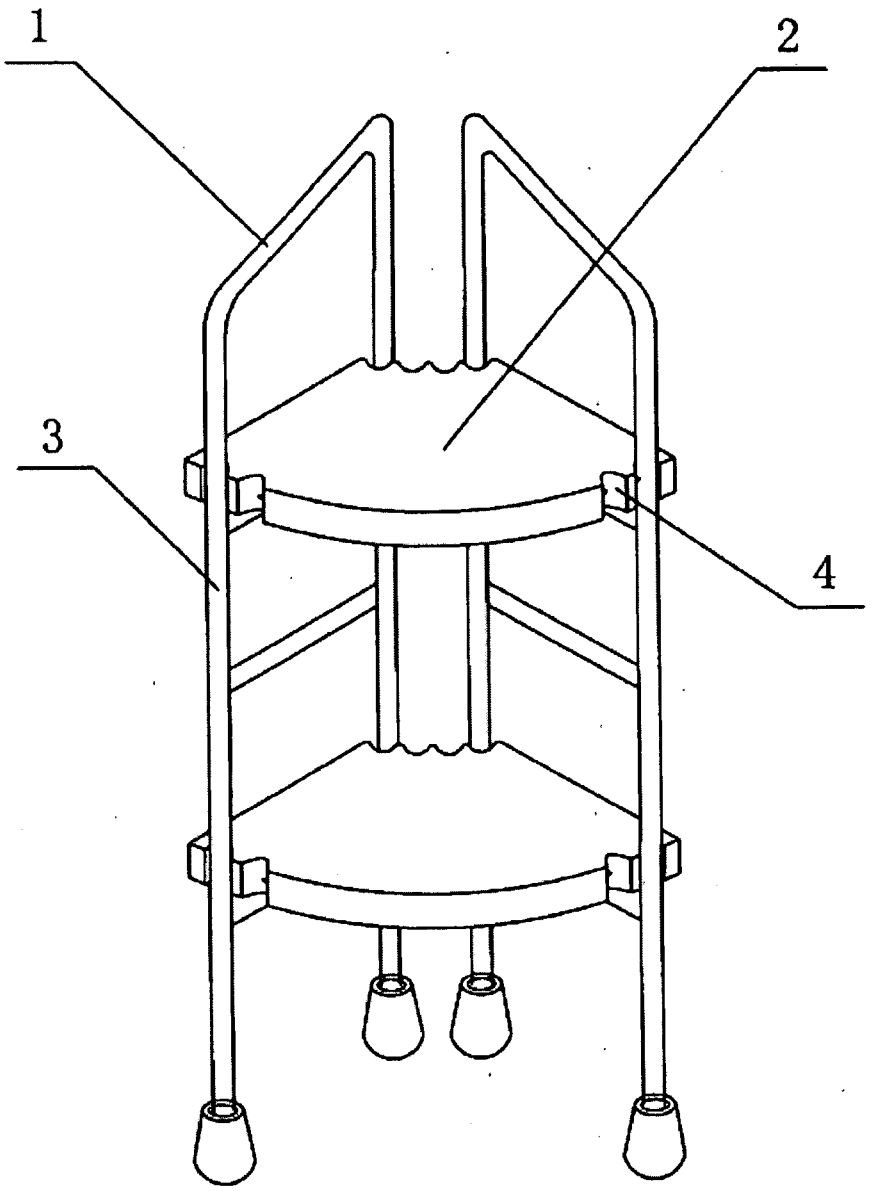

FIG. 15

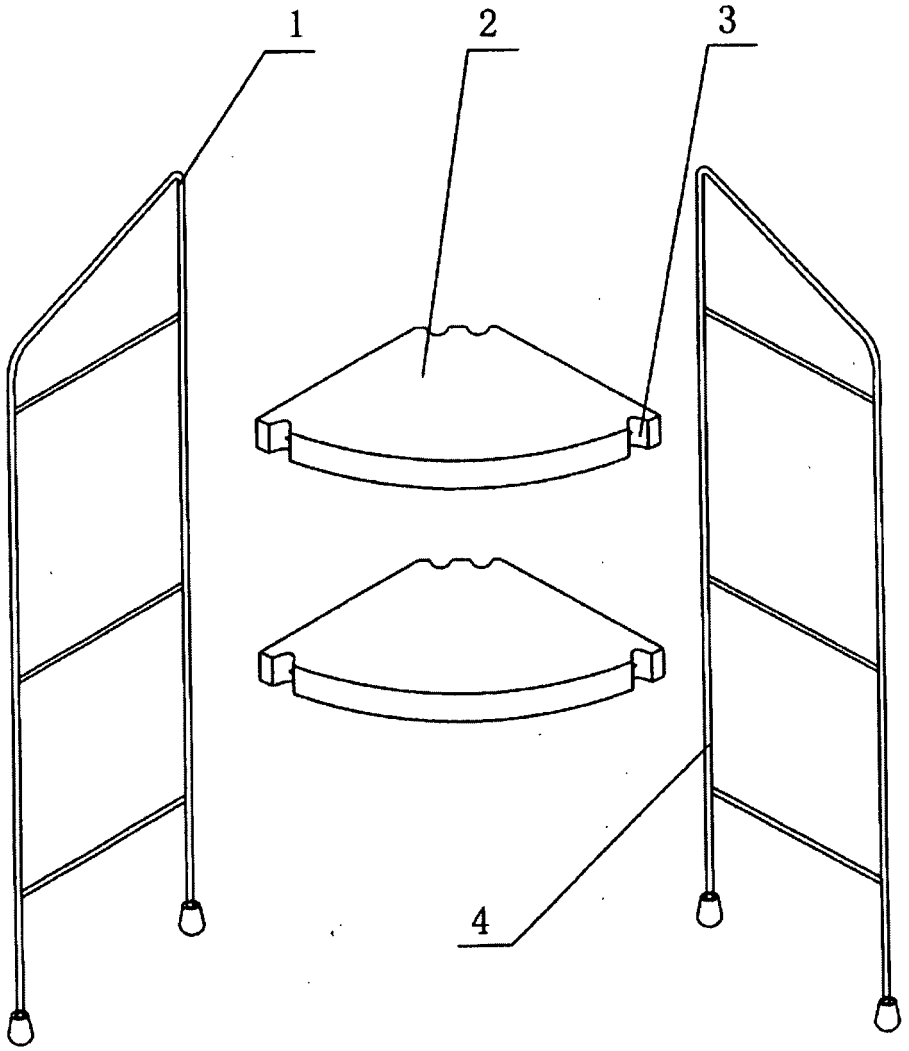

FIG. 16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2008/000518

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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)

IPC: A47B47, A47B43, A47B57, A47F3, A47F5, A47F7

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)

WPI, EPODOC, PAJ, CNPAT, CNKI: shelf, plastic, plate, concave, notch, protru+, project+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO0035316A(TRADE HIRE CONSTRUCTIONS PTY LTD) 22 Jun. 2000 (22.06.2000) line 14, page 4 to line 14, page 5 in the description, figs 1,2	1,3
PX	CN201026003Y(LIANG Jingsong) 27 Feb. 2008 (27.02.2008) the whole document	1-3
A	EP1201160A(Bigla AG) 02 May 2002 (02.05.2002) the whole document	1-3
A	WO03015578A(ROYAL ALLIANCE INC.) 27 Feb. 2003 (27.02.2003) the whole document	1-3
A	CN2441370Y(LI Xinnong) 08 Aug. 2001 (08.08.2001) the whole document	1-3

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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

"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

"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
05.May 2008 (05.05.2008)	**10 Jul. 2008 (10.07.2008)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer WEN Guanghui Telephone No. (86-10)62085313

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2008/000518

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
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		AU755836B	19.12.2002
		EP1139818A	10.10.2001
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		AU2002322899A	03.03.2003
CN2441370Y	08.08.2001	none	

Form PCT/ISA/210 (patent family annex) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2008/000518

(continuation of second sheet)

A. CLASSIFICATION OF SUBJECT MATTER

A47B47/04(2006.01)i

A47F3/06(2006.01)i

Form PCT/ISA/210 (extra sheet) (April 2007)