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(54) **Combination Storage Rack**

(57) A combination storage rack includes a plurality of upright supports each formed of a plurality of bamboo rods equiangularly arranged around the periphery and a plurality of spacer blocks fixedly mounted in the bamboo rods at different elevations to keep the bamboo rods apart from one another, a plurality of tapered locating members respectively fastened to the upright supports and supported on the spacer blocks, and a plurality of rack panels that have tapered through holes for the passing of the upright supports and for engagement with the tapered locating blocks.

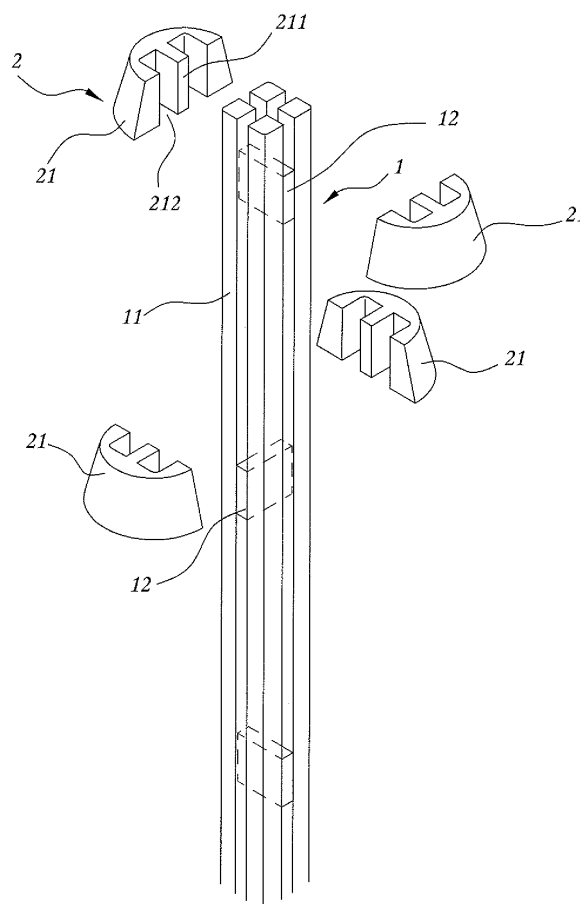


FIG. 1

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention:

[0001] The present invention relates to a storage rack and more particularly, to a combination storage rack that uses multi-angle upright supports with tapered locating blocks to support rack panels.

2. Description of the Related Art:

[0002] Wood, plastics, and many other materials are selectively used for making display racks, storage racks or partition screens. In order to show an antique sense of beauty, bamboo or wood material is the best choice for making storage racks.

[0003] Conventionally, a bamboo or wooden storage rack is comprised of a plurality of upright supports and a plurality of rack panels horizontal fastened to the upright supports at different elevations for holding things. The rack panels are affixed to the upright supports with screws or with screw bolts and nuts. It is quite inconvenient to assemble or disassemble this design of bamboo or wooden storage rack, i.e., this design does not lend itself to the DIY concept.

SUMMARY OF THE INVENTION

[0004] The present invention has been accomplished under the circumstances in view. It is the main object of the present invention to provide a combination storage rack, which can easily and rapidly be assembled and disassembled.

[0005] To achieve this and other objects of the combination storage rack comprises a plurality of upright supports each formed of a plurality of bamboo rods equiangularly arranged around the periphery and a plurality of spacer blocks fixedly mounted in the bamboo rods at different elevations to keep the bamboo rods apart from one another, a plurality of tapered locating members respectively fastened to the upright supports and supported on the spacer blocks, and a plurality of rack panels that have tapered through holes for the passing of the upright supports and for engagement with the tapered locating blocks.

[0006] In one embodiment of the present invention, each upright support comprises four rectangular bamboo rods arranged in four corners in a parallel manner. Further, the spacer blocks are fixedly mounted in the bamboo rods such that the cross section of each upright support

at each spacer block shows a substantially  shaped configuration. Further, the tapered locating blocks are shaped like a truncated cone, each formed of two symmetrical halves. Each half of each tapered locating block comprises two vertical mounting grooves adapt-

ed for receiving two bamboo rods of one upright support, and a mounting rib defined between the two vertical mounting grooves and adapted for engaging into the space between the two bamboo rods that are engaged into the two vertical mounting grooves of one tapered locating block.

[0007] In another embodiment of the present invention, each spacer block comprises a plurality of vertical mounting grooves equiangularly spaced around the periphery thereof. Further, the bamboo rods of each upright support are respectively fastened to the vertical mounting grooves of the spacer blocks of the respective upright support and kept in flush with the periphery of the associating spacer blocks. Further, each tapered locating block is formed of two symmetrical halves that fit over the periphery of the associating upright support. Each half of each tapered locating block comprises at least one mounting rib protruded from an inside wall thereof and fitted in the gap between two bamboo rods of the associating upright support.

[0008] By means of the aforesaid arrangement, the upright supports, the tapered locating blocks and the rack panels can easily and detachably be fastened together, forming a storage rack without any tool or fastening devices. When not in use, the rack panels and the tapered locating blocks can be directly detached from the upright supports without any tool. Therefore, the design of the present invention lends itself very well to the DIY concept.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

FIG. 1 is an exploded view of a part of a combination storage rack in accordance with a first embodiment of the present invention, showing the structure of the upright support and the tapered locating block.

FIG. 2 is an elevational assembly view of FIG. 1.

FIG. 3 is a schematic elevational assembly view of the combination storage rack according to the first embodiment of the present invention.

FIG. 4 is a schematic sectional lateral view of a part of the first embodiment of the present invention, showing tapered locating blocks fastened to upright supports before mounting of a rack panel.

FIG. 5 is a sectional lateral plain view of a part of the first embodiment of the present invention, showing rack panels fastened to the upright supports and supported on tapered locating blocks at the upright supports.

FIG. 6 is an elevational view of the combination storage rack according to the first embodiment of the present invention.

FIG. 7 is an exploded view of an upright support of a combination storage rack in accordance with a second embodiment of the present invention.

FIG. 8 corresponds to FIG. 7, showing the relationship between the two symmetrical halves of one ta-

pered locating block and the upright support.

FIG. 9 is an elevational assembly view of FIG. 8.

FIG. 10 is an elevational view of the combination storage rack according to the second embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0010] Referring to the annexed drawings in detail, a combination storage rack in accordance with the present invention is shown comprising a plurality of upright supports **1** (see FIG. 1), a plurality of tapered locating blocks **2** (see FIGS. 1 and 2), and a plurality of rack panels **3** (see FIG. 3).

[0011] Each upright support **1** comprises four rectangular bamboo rods **11** arranged in four corners in a parallel manner, and a plurality of spacer blocks **12** fixedly mounted in the bamboo rods **11** at different elevations and alternatively extending in X-axis and Y-axis directions to space the bamboo rods **11** from one another. When viewed from one end, each upright support **1**

shows a substantially “田” shaped configuration. Further, the spacer blocks **12** can be affixed to the bamboo rods **11** by means of adhesive bonding or fastening means.

[0012] The tapered locating blocks **2** are shaped like a truncated cone, each formed of two symmetrical halves **21**. Each half **21** has two vertical mounting grooves **212** adapted for receiving two bamboo rods **11** of one upright support **1**, and a mounting rib **211** defined between the two vertical mounting grooves **212** and adapted for engaging into the space between the two bamboo rods **11** that are engaged into the two vertical mounting grooves **212**.

[0013] The rack panels **3**, as shown in FIGS. 3 and 4, are rectangular panels formed of a bamboo frame and a plurality of bamboo strips, each having a tapered through hole **31** in each of the four corners thereof. The tapered through hole **31** has a diameter fitting the tapered locating blocks **2** and gradually reduced from the bottom side of the respective rack panel toward the top side.

[0014] During installation, the tapered locating blocks **2** are respectively fastened to the upright supports **1** by means of forcing the vertical mounting grooves **212** of the two symmetrical halves **21** of each tapered locating block **2** into engagement with the bamboo rods **11** of each respective upright support **1**, and respectively stopped at the top side of the spacer blocks **12** (as shown in FIGS. 1 and 2). After one respective locating block **2** has been fastened to each of the four upright supports **1** and supported on the respective lowest spacer block **12** of the associating upright support **1**, the four upright supports **1** are respectively inserted through the four tapered through hole **31** of one rack panel **3** to have the four tapered through hole **31** be respectively forced into positive engagement with the lowest spacer block **12** of each

of the four upright supports **1**, and thereafter the other locating blocks **2** and the other rack panels **3** are installed in the same manner in a proper order (see FIGS. 3–6). Further, hanging rods **4** are respectively horizontally connected between two upright supports **1** for hanging things.

FIGS. 7–10 show a combination storage rack in accordance with a second embodiment of the present invention. According to this second embodiment, each upright support **1** comprises a plurality of bamboo rods **11** and a plurality of spacer blocks **12A**.

[0015] The spacer blocks **12A** are flat circular blocks, each having a plurality of mounting grooves **12B** cut through the top and bottom sides thereof and equiangularly spaced around the periphery. The bamboo rods **11** are respectively attached to the mounting grooves **12B** of the spacer blocks **12A** and kept in flush with the periphery of the spacer blocks **12A**. Further, the two symmetrical halves **21** of each tapered locating block **2** fit over the periphery of each upright support **1**, each having at least one, for example, one mounting rib **211** engaged into the space between two adjacent bamboo rods **11**. After installation of the tapered locating blocks **2** in the upright supports **1**, the tapered locating blocks **2** are respectively supported on the spacer blocks **12A** to hold the rack panels **3** firmly at different elevations (see FIG. 10).

[0016] Although a particular embodiment of the invention has been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended claims.

Claims

1. A combination storage rack comprising:

a plurality of upright supports, each said upright support comprising a plurality of bamboo rods equiangularly arranged around the periphery and a plurality of spacer blocks fixedly mounted in said bamboo rods at different elevations to keep said bamboo rods apart from one another; a plurality of tapered locating members respectively fastened to said upright supports and supported on said spacer blocks; and a plurality of rack panels horizontally fastened to said tapered locating blocks and said upright supports at different elevations, each said rack panel comprising a plurality of tapered through holes cut through top and bottom sides thereof for the passing of said upright supports and for engagement with said tapered locating blocks.

2. The combination storage rack as claimed in claim 1, wherein each said upright support comprises four

rectangular bamboo rods arranged in four corners in a parallel manner; said spacer blocks are fixedly mounted in the bamboo rods such that the cross section of each said upright support at each said spacer

block shows a substantially “” shaped configuration; said tapered locating blocks are shaped like a truncated cone, each formed of two symmetrical halves, each half of each said tapered locating block comprising two vertical mounting grooves adapted for receiving two bamboo rods of one said upright support, and a mounting rib defined between said two vertical mounting grooves and adapted for engaging into the space between the two bamboo rods that are engaged into the two vertical mounting grooves of one said tapered locating block.

3. The combination storage rack as claimed in claim 1, wherein each said spacer block comprises a plurality of vertical mounting grooves equiangularly spaced around the periphery thereof; the bamboo rods of each said upright support are respectively fastened to the vertical mounting grooves of the spacer blocks of the respective upright support and kept in flush with the periphery of the associating spacer blocks; each said tapered locating block is formed of two symmetrical halves that fit over the periphery of the associating upright support, each half of each said tapered locating block comprising at least one mounting rib protruded from an inside wall thereof and fitted in the gap between two bamboo rods of the associating upright support.

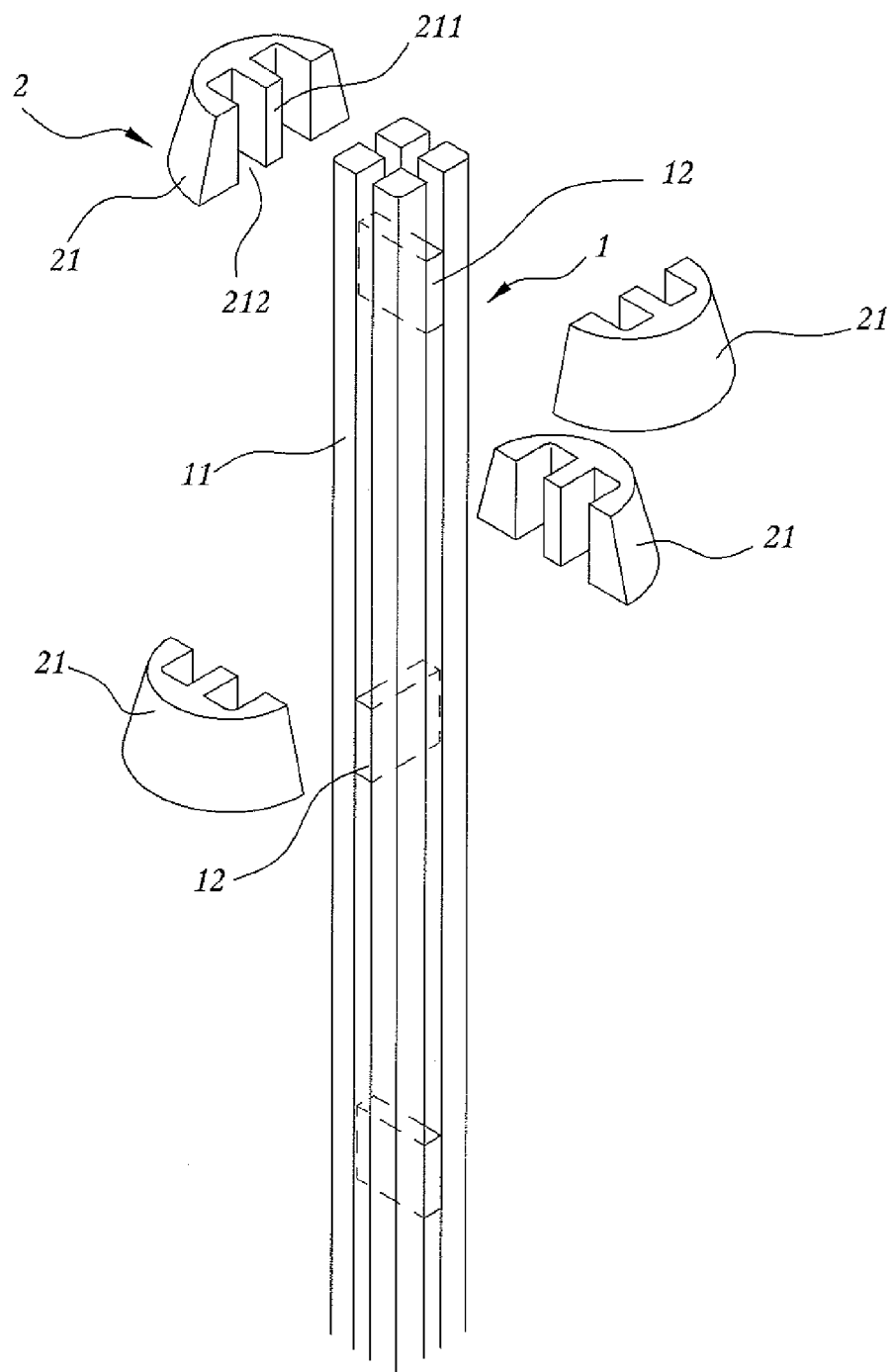


FIG. 1

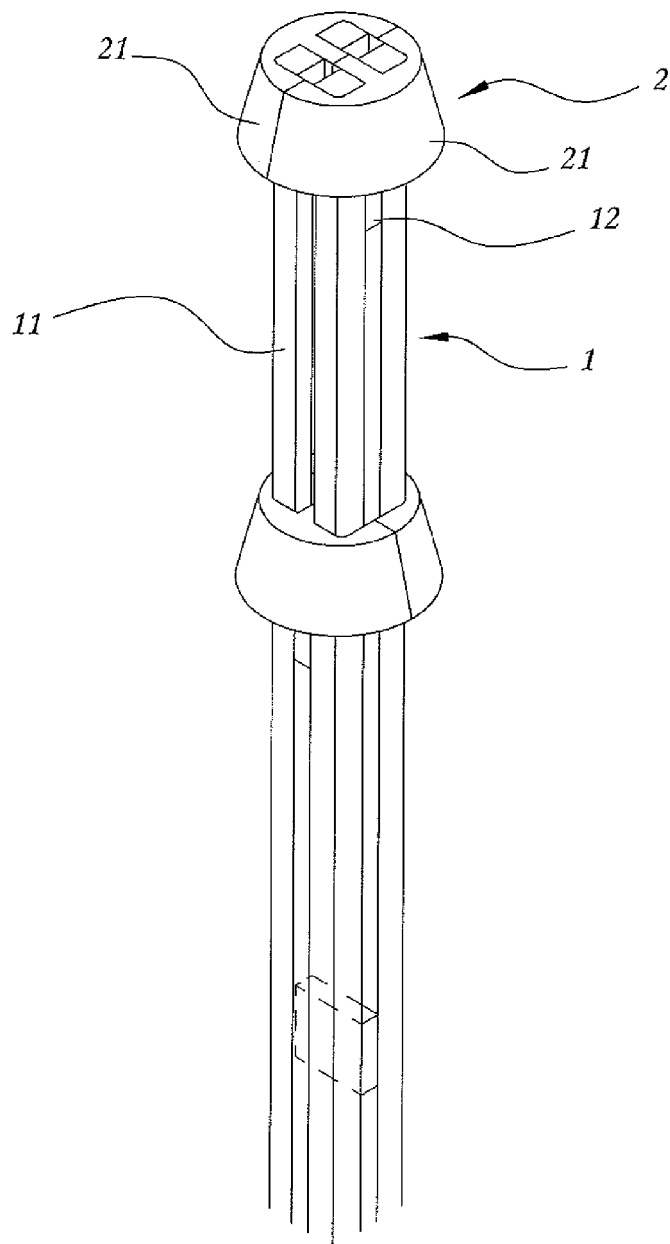


FIG. 2

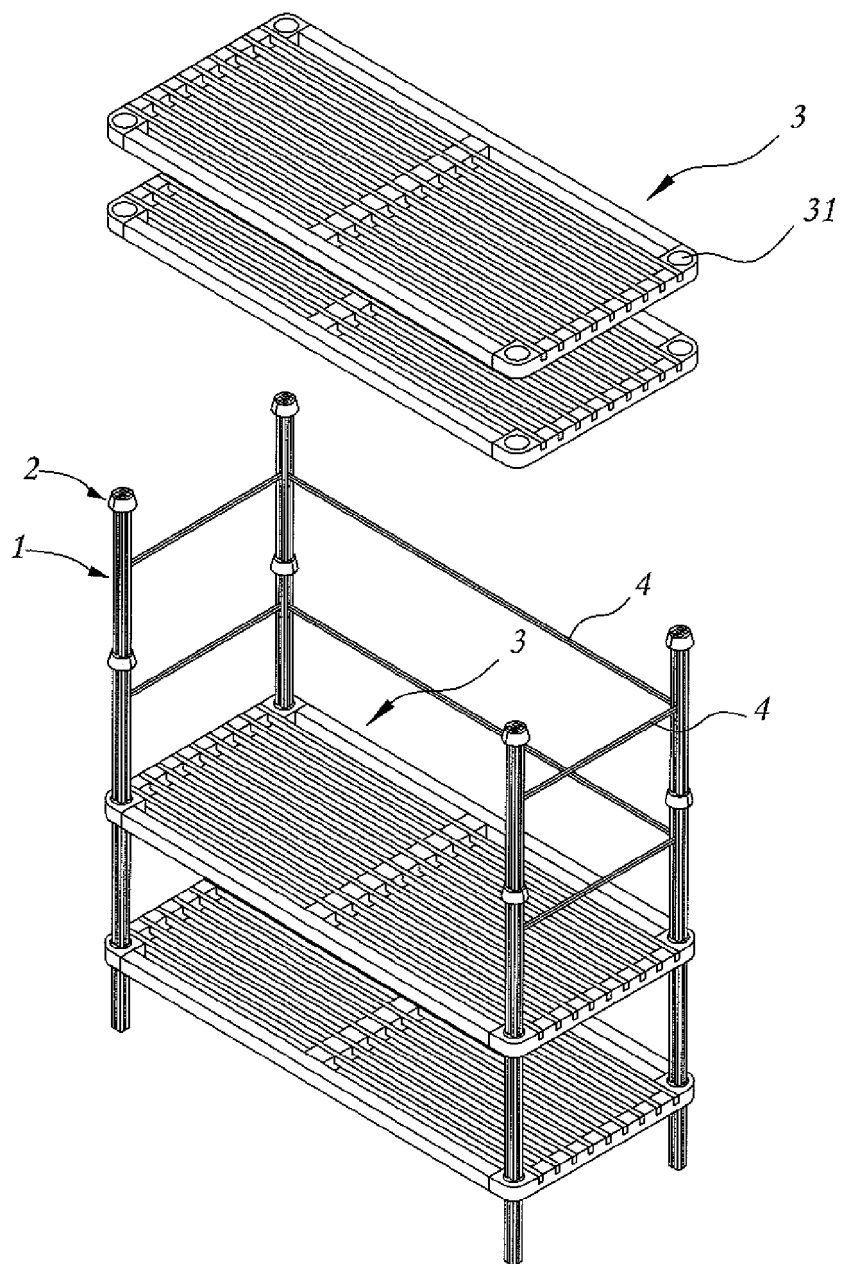


FIG. 3

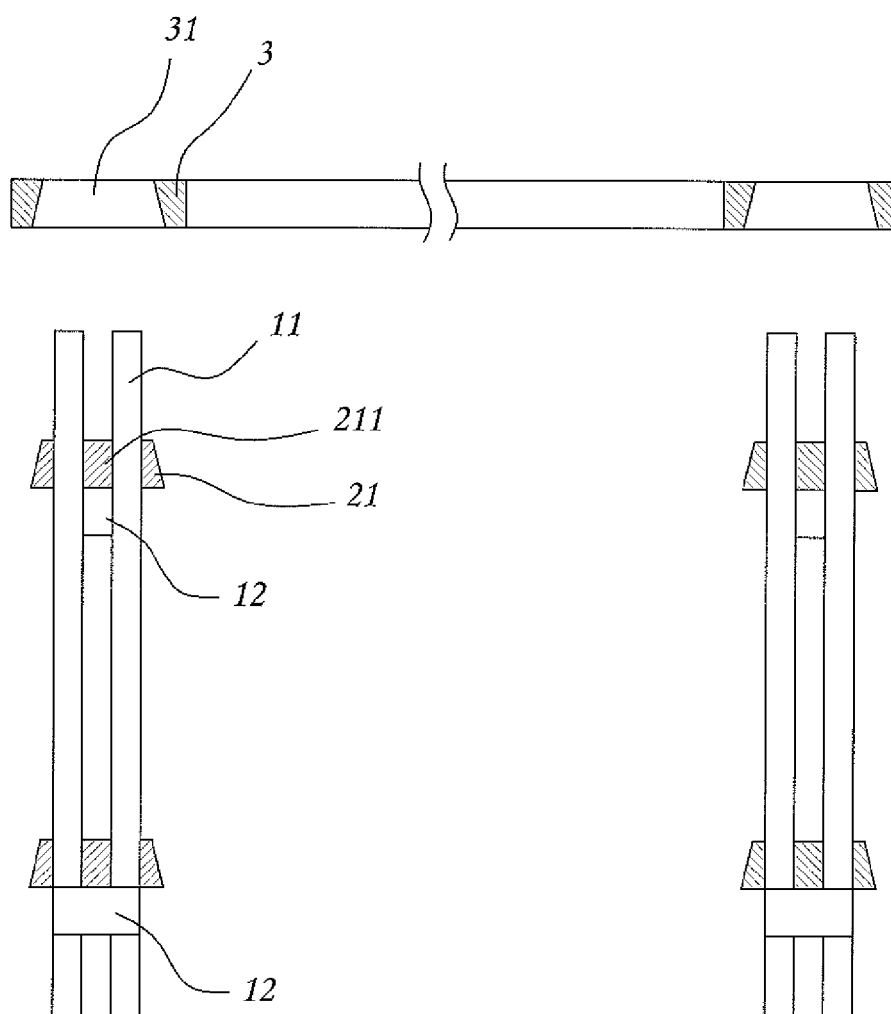


FIG. 4

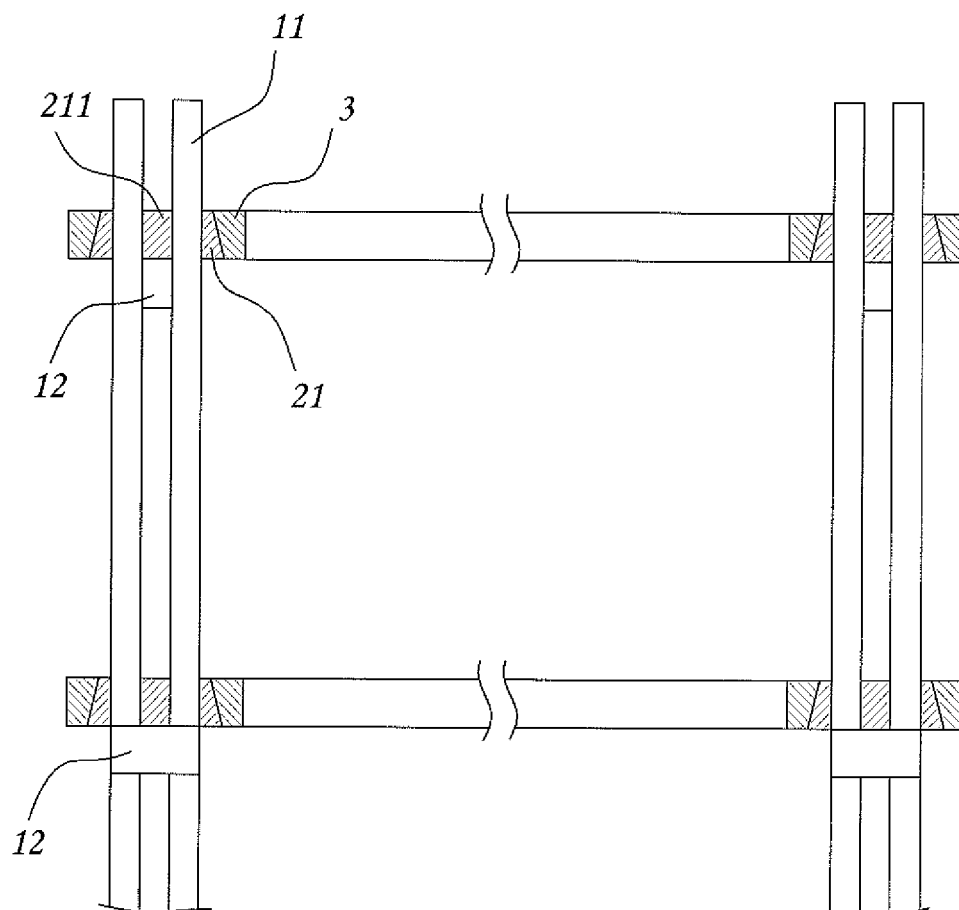


FIG. 5

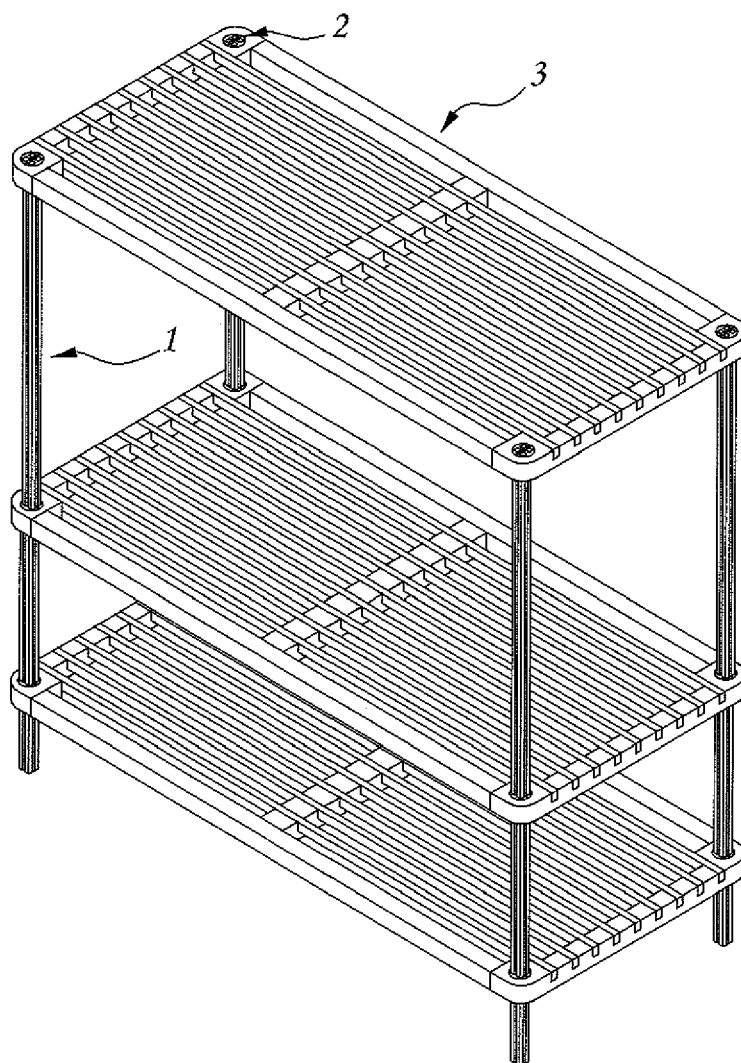


FIG. 6

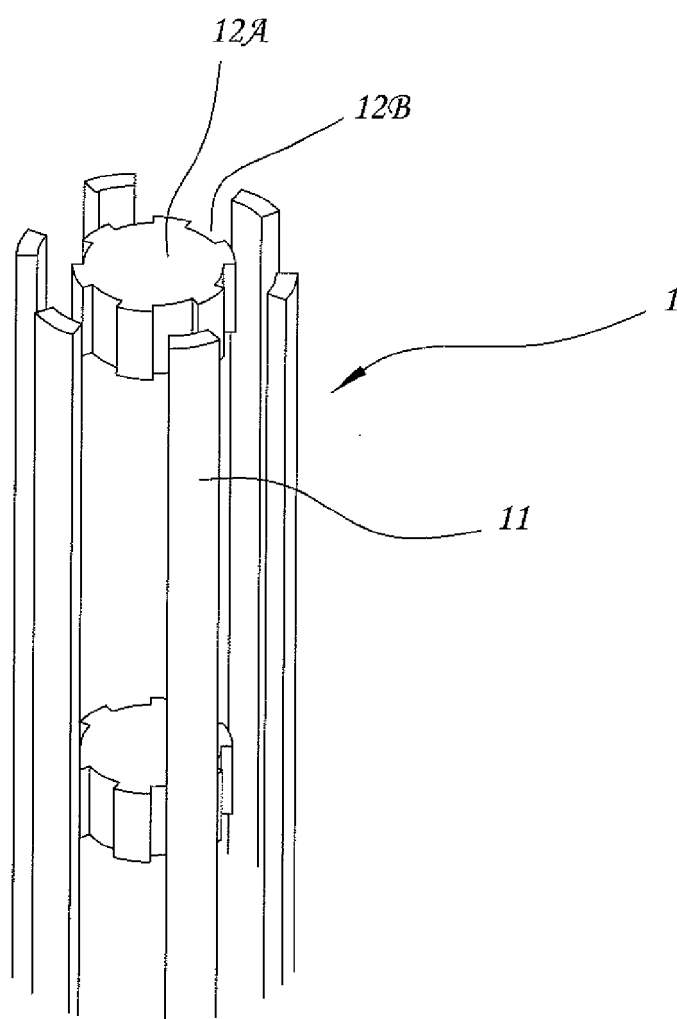


FIG. 7

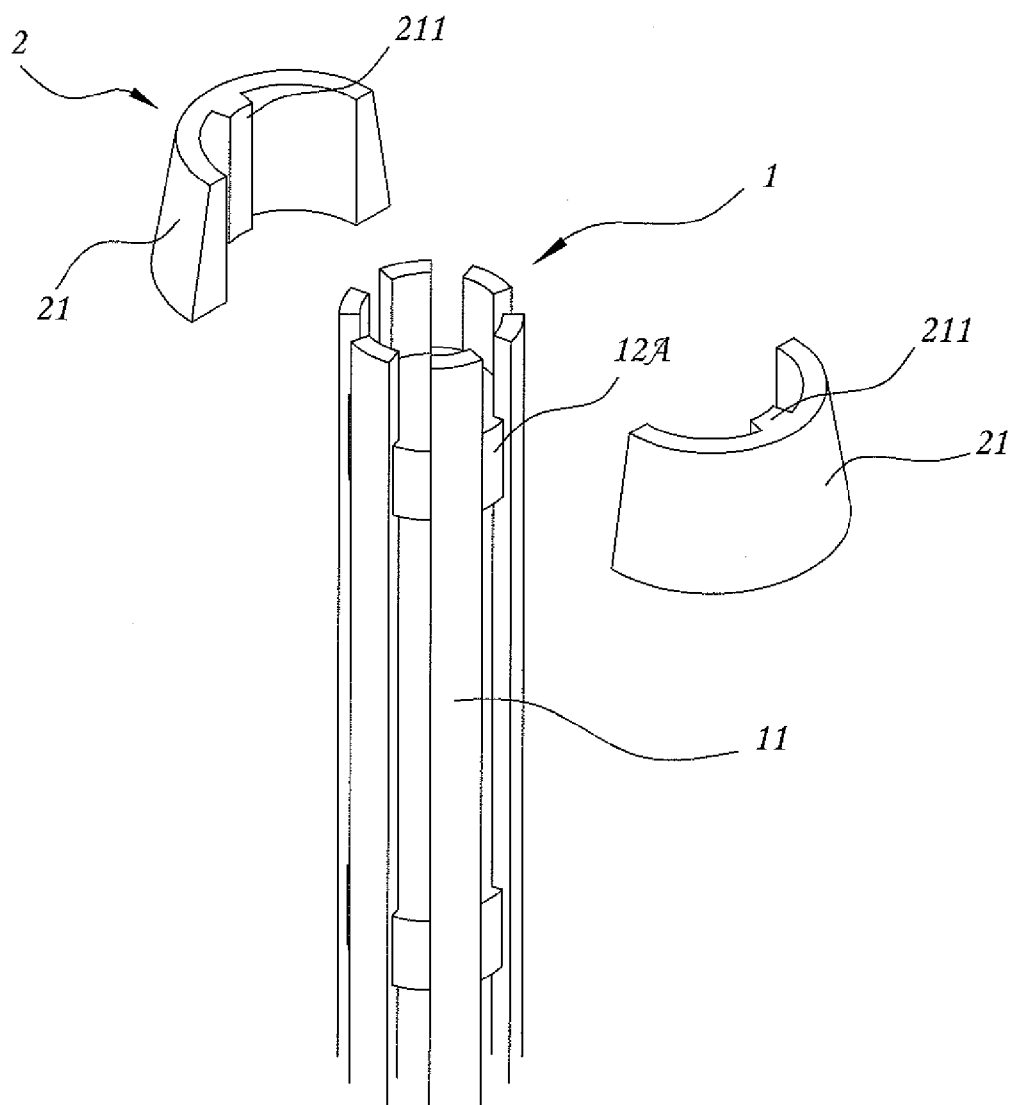


FIG. 8

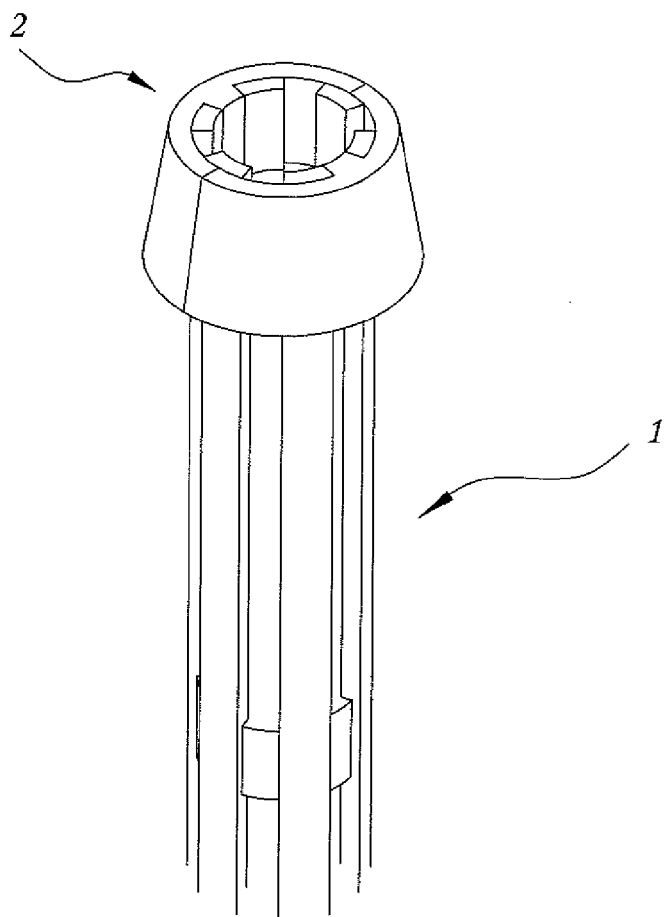


FIG. 9

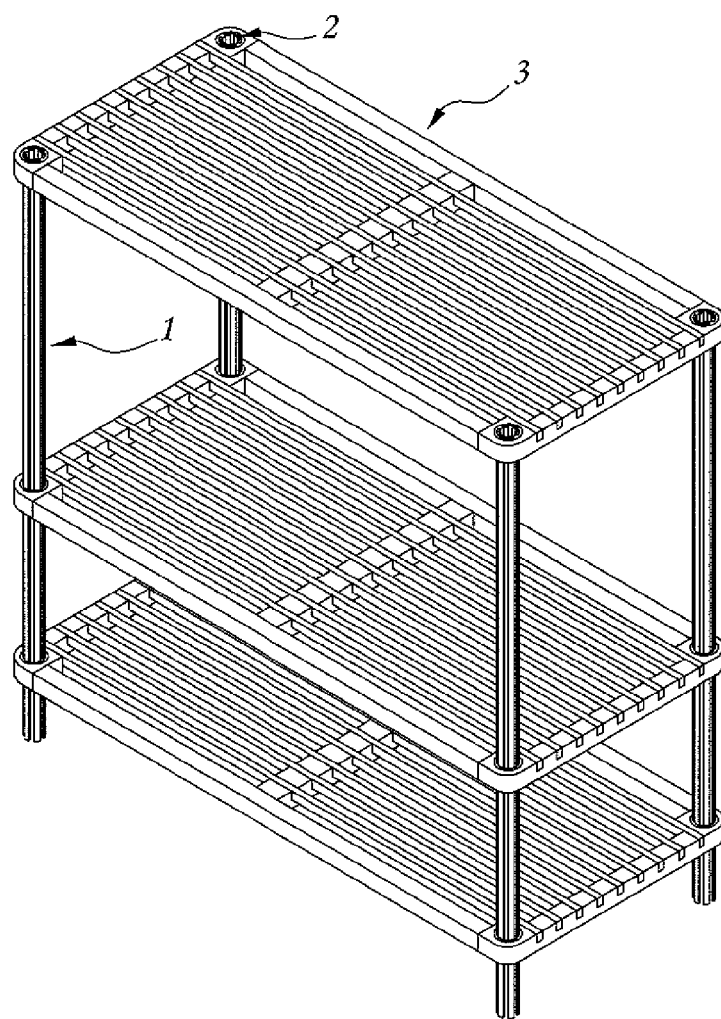


FIG. 10



EUROPEAN SEARCH REPORT

Application Number
EP 09 15 9723

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	FR 2 846 207 A (PERETTI BRUNO [FR]) 30 April 2004 (2004-04-30) * the whole document *	1-3	INV. A47B47/04 A47B57/34
A	DE 89 12 144 U1 (SCHERFEDER DRAHTWARENFABRIK GMBH & CO KG, 3530 WARBURG, DE) 23 November 1989 (1989-11-23) * the whole document *	1-3	
A	CA 1 275 282 C (NAGTHALL TYRONE [CA]) 16 October 1990 (1990-10-16) * the whole document *	1-3	
A	US 2007/267371 A1 (FARLEY SEAN S [US]) 22 November 2007 (2007-11-22) * the whole document *	1-3	
A	EP 1 967 092 A (HUANG LI-HSU [TW]) 10 September 2008 (2008-09-10) * the whole document *	1-3	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 17 September 2009	Examiner Cardan, Cosmin
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (F04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 15 9723

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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17-09-2009

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