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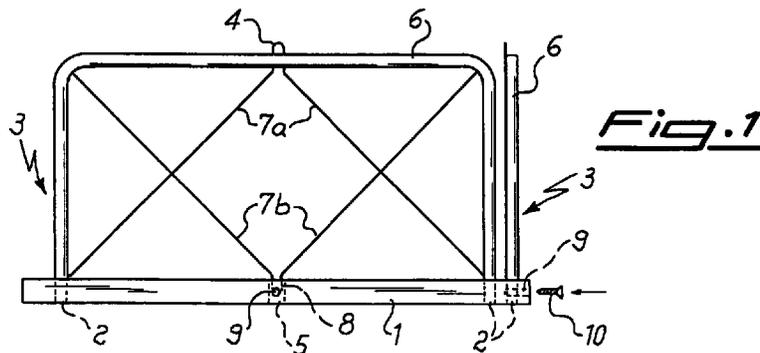
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(54) **Modular element for sectional shelvings**

(57) A modular element for sectional shelvings includes a shelf (1, 1') provided with holes (2) for vertically inserting therein at least two supporting structures (3) provided with a top pin (4) and a bottom pin (8) which are aligned and suitable to enter corresponding reference holes (5) formed in said shelf (1, 1'), said pins (4, 8) being provided with a horizontal eyelet and being long enough as to overlap with the corresponding pins

(4, 8) of the adjacent elements in the stack. At each reference hole (5), in the middle of the thickness of the shelf (1, 1'), there is formed a horizontal hole (9) extending upto said reference hole (5) so that two adjacent elements in the stack can be easily and effectively restrained by means of a screw (10) which is introduced in the overlapping eyelets of the two pins (4, 8).



EP 0 852 919 A1

## Description

The present invention relates to sectional shelvings, and in particular to a modular element suitable to make sectional shelvings with a simple and solid structure.

It is known that a great number of different modular elements for sectional shelvings exist, each element being usually made up of a shelf and at least a pair of supporting structures inserted into holes formed in the shelf. The assembly systems of the shelvings may be more or less complicated, one of the simplest being that of stacking the elements of the shelving by means of holes on the lower side of the shelves and corresponding reference pins at the top of the supporting structures.

This system has clear advantages as to ease of manufacture and assembly, but also a serious drawback for the user. In fact, this system does not provide a bidirectional restraint between the various elements which make up the shelving, but only a restraint against horizontal sliding. In other words, if you try to lift the shelving by seizing it at a shelf thereof, the latter will slip out from the underlying element on which it abuts whereby the shelving will be divided into two parts. Similarly, when placing a heavy item on the edge of the shelf it is possible that the latter slips out partially thus becoming inclined so much that the placed item may fall to the ground.

Therefore it is clear that it is absolutely preferable to avoid having a shelving whose structural solidity is so insecure that it allows undesired uncouplings between the elements which make it up.

Therefore the object of the present invention is to provide a modular element suitable to overcome the above-mentioned drawbacks.

This object is achieved by means of a modular element having the characteristics disclosed in claim 1.

The main advantage of the present modular element is that of providing the desired bidirectional restraint while retaining the ease of manufacture and assembly.

This and other advantages and characteristics of the modular element according to the present invention will be clear to those skilled in the art from the following detailed description of some embodiments thereof, with reference to the annexed drawings wherein:

Figs. 1, 2 and 3 schematically show an orthogonal side, front and bottom view, respectively, of a first embodiment of the modular element according to the present invention;

Fig. 4 shows a schematic perspective view of a shelving made with modular elements according to the preceding figures;

Fig. 5 shows a schematic perspective view of a shelving made with modular elements according to a second embodiment; and

Fig. 6 shows a schematic perspective view of a shelving made with different modular elements according to various embodiments.

With reference to figs. 1-3, there is seen that a modular element according to the present invention includes a shelf 1 wherein, in suitable holes 2, there are vertically inserted three supporting structures 3 ending at the top with a pin 4 suitable to enter the corresponding through holes 5 formed in shelf 1. In this first embodiment, shelf 1 is square and the supporting structures 3 are arranged along three sides of the shelf close to the edge thereof.

Each supporting structure 3 consists of an arc 6 having the shape of an inverted U on which there are welded a first pair of rods 7a forming an inverted V and a second pair of rods 7b forming a V. Rods 7a, 7b are welded to arc 6 in a plane substantially coplanate thereto at the ends of the arc and at the bends thereof, respectively. The converging ends of rods 7a are joined to form pin 4 which is welded as well to arc 6 and has an eyelet, while the converging ends of rods 7b are joined to form an identical pin 8 with eyelet and directed downwards.

As clearly shown in the figures, the supporting structure 3 is made so that pins 4 and 8 are vertically aligned with each other and with the reference holes 5 in shelf 1, pins 8 being inserted in said holes 5. Therefore, when two modular elements are stacked, each hole 5 will receive a pin 8 of the supporting structure 3 of the upper element and a pin 4 of the corresponding supporting structure 3 of the lower element. The length of pins 4 and 8 is such that their eyelets overlap within hole 5.

At each hole 5, in the middle of the thickness of shelf 1, there is formed a horizontal hole 9 extending upto hole 5. Hole 9 allows to introduce horizontally a retainer, typically a screw 10, so as to mutually restrain the above-mentioned pins 4 and 8 in a simple and effective way. As a consequence, the various modular elements making up the shelving are solidly joined to each other, since each supporting structure 3 is restrained to the corresponding underlying and/or overlying supporting structure 3 through shelves 1.

Therefore it is clear that the modular element according to the present invention achieves the desired objects without any significant increase neither in the manufacturing costs nor in the assembly difficulty. Moreover, it is still possible to assemble a shelving without bidirectional restraints as in prior art modular elements, e.g. in case of temporary assembly, without any increase in the assembly time.

Figure 4 shows an example of a shelving made with five of the above-described modular elements, in addition to a top shelf 11 and four wheels 12 secured to the bottom element. Obviously, the number of elements used may be freely changed according to the height of the shelving which is desired. Furthermore, it is possible

to exploit the square shape of the elements for stacking them not all facing in the same direction, i.e. with the "open" side lacking the supporting structure 3 which faces a different direction between a shelf and the adjacent one. In order to accomplish this, it is sufficient to form holes 5 on all sides of shelf 1 and to connect two adjacent elements at two supporting structures 3 only.

Figure 5 shows a shelving similar to that of fig.4 but made with a second embodiment of the present modular element. This second embodiment is different from the previous embodiment in the double width of shelves 1', which are now rectangular, and in the presence of the supporting structures 3 only along the short sides of said shelves 1'. However, it should be noted that the supporting structures 3 are the same as well as the same is the connecting mechanism by means of screws introduced in holes 9. Clearly, it is possible to arrange one or two supporting structures 3 also along one of the long sides of shelves 1', or along both as an alternative to those on the short sides. Similarly, the first embodiment could include just two supporting structures 3, along opposite or adjacent sides of shelves 1.

Finally, fig.6 illustrates a further shelving similar to the previous ones and made with "mixed" modular elements. The shelving of fig.6 results from the joining of two symmetrical halves each being formed by a bottom element with a double-width shelf 1' and four of the above-described square elements, in addition to a top double-width shelf 11'. It should be noted that in the bottom element there are inserted three supporting structures 3 arranged as in the square elements, i.e only in the outer half of shelf 1'. The two halves are also connected by a hanger bar 13 secured at the top element.

It is clear that the above-described and illustrated embodiments of the modular element according to the invention are just examples susceptible of various modifications. In particular, the shape of the supporting structures 3 may be somewhat changed according to aesthetical-functional requirements, even combining different shapes of structures on a single element, as long as pins 4, 8 with eyelets or equivalents thereto are still present. Similarly, shape and size of shelves 1, 1' are freely changeable as well as the number, shape and arrangement of holes 2, 5 and 9 as long as the possibility of introducing a horizontal retainer suitable to mutually restrain pins 4 and 8 is guaranteed. In this respect, it should be noted that the overlapping of the eyelets of pins 4 and 8 and their relative locking by means of the horizontal retainer may occur even above or below shelf 1 and not necessarily within hole 5.

## Claims

1. Modular element for sectional shelveings, including a shelf (1, 1') provided with holes (2) for vertically inserting therein at least two supporting structures (3) provided at the top with a pin (4) suitable to enter corresponding reference holes (5) formed in

said shelf (1, 1'), characterized in that each of said supporting structures (3) is provided at the bottom with a second pin (8) vertically aligned with said top pin (4) and suitable to enter therewith said reference holes (5), said pins (4, 8) being provided with a horizontal eyelet and being long enough as to overlap with the corresponding pins (4, 8) of the adjacent elements in the stack.

2. Modular element according to claim 1, characterized in that at each reference hole (5) there is formed a horizontal hole (9) extending upto said reference hole (5).

3. Modular element according to claim 1 or 2, characterized in that each supporting structure (3) consists of an arc (6) having the shape of an inverted U on which there are welded a first pair of rods (7a) forming an inverted V and a second pair of rods (7b) forming a V, said rods (7a, 7b) being welded to said arc (6) in a plane substantially coplanate thereto at the ends and at the bends thereof, the converging ends of the first rods (7a) being joined to form the top pin (4) and the converging ends of the second rods (7b) being joined to form the bottom pin (8).

4. Modular element according to one or more of the preceding claims, characterized in that the shelf (1) is square and has reference holes (5) on all sides.

5. Sectional shelving characterized in that it is made with a stack of modular elements according to one or more of the preceding claims and it further includes an end shelf (11, 11') secured at the top of the top element and a plurality of wheels (12) secured at the bottom of the bottom element.

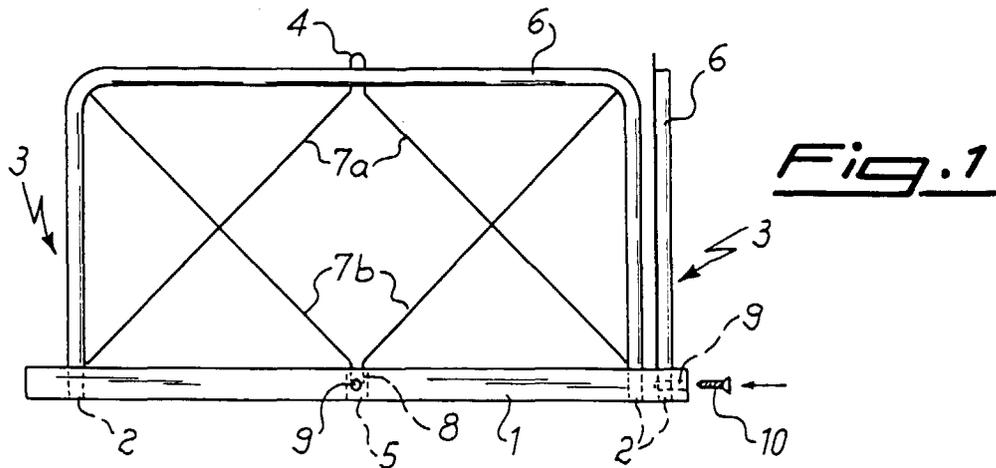


Fig. 1

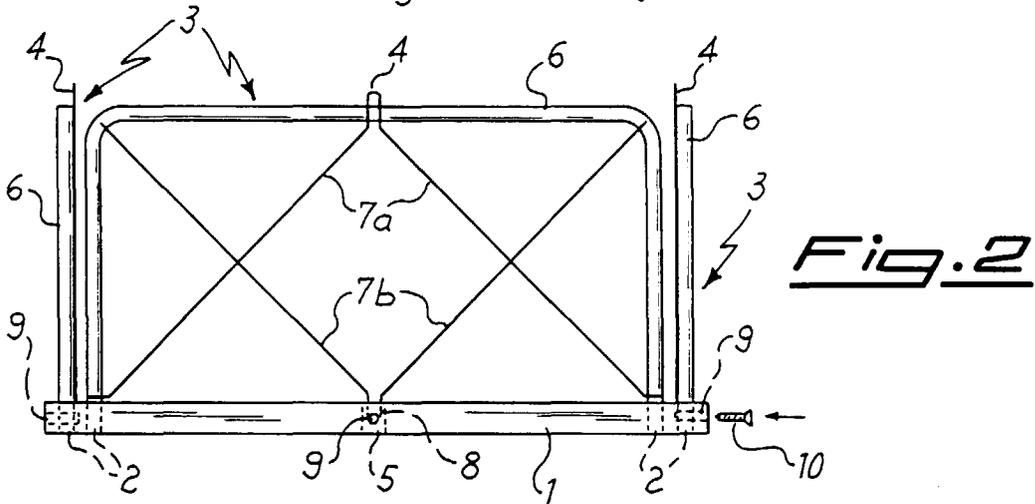


Fig. 2

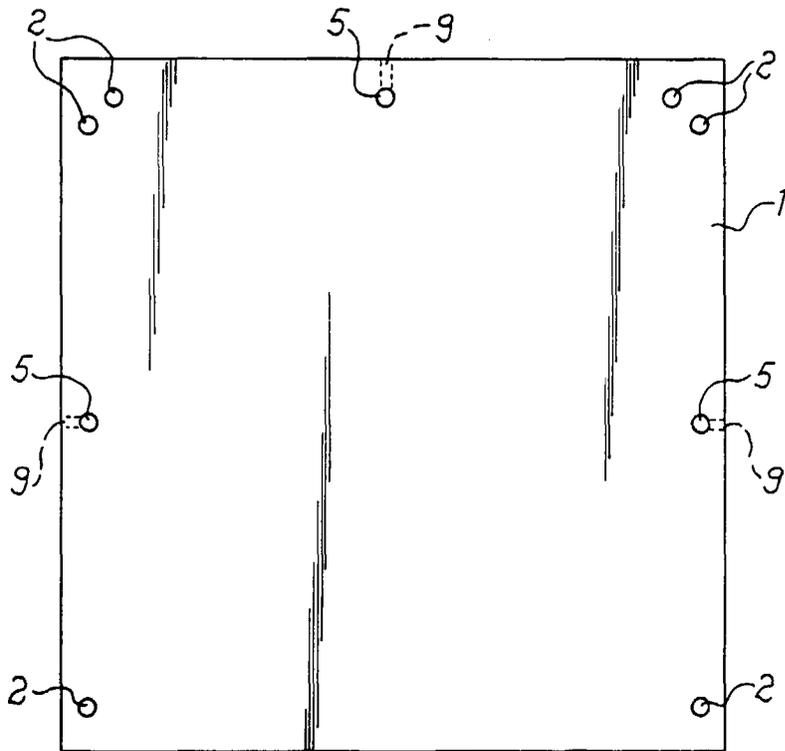
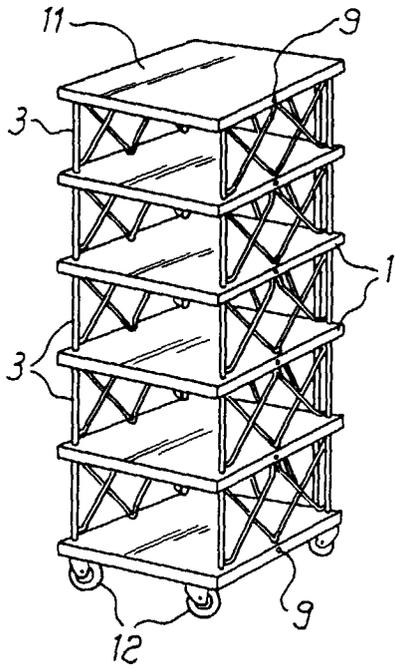
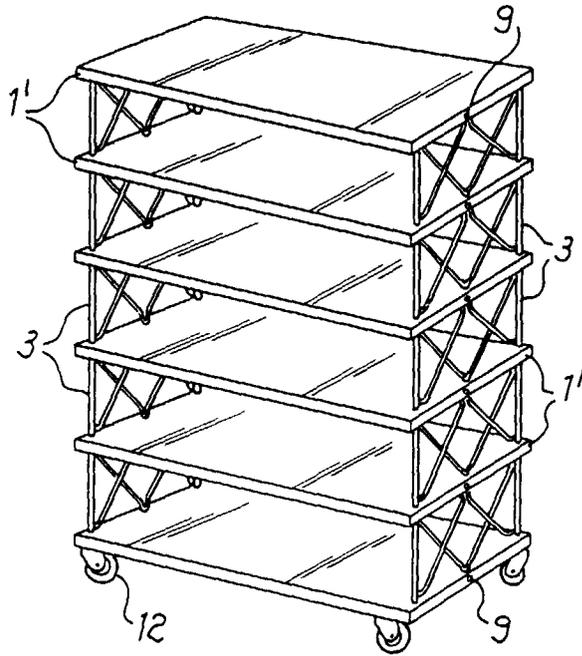


Fig. 3

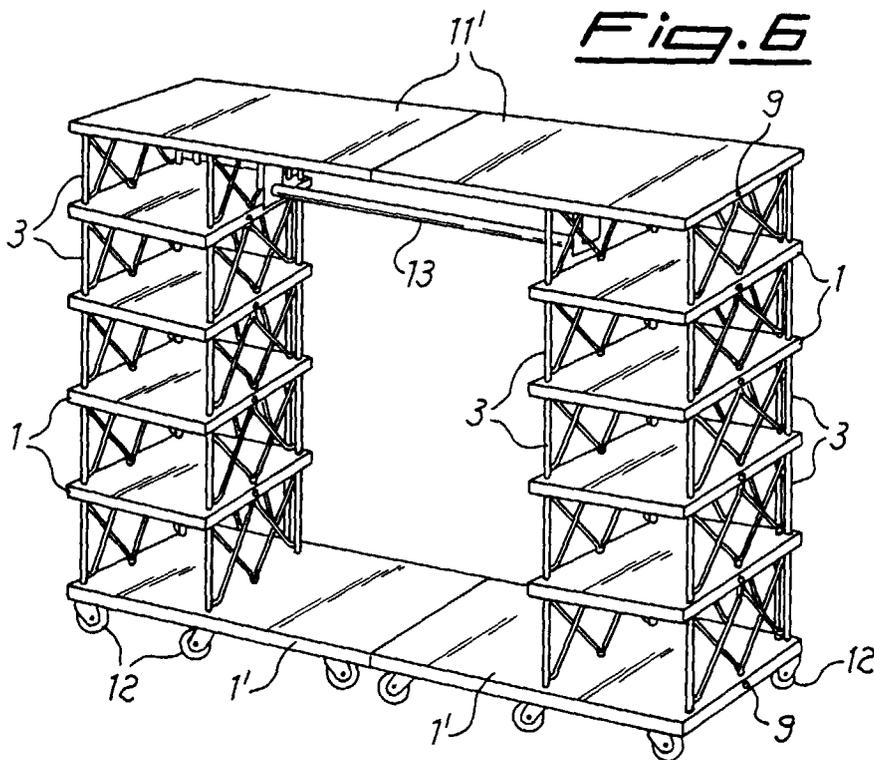
*Fig. 4*



*Fig. 5*



*Fig. 6*





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EUROPEAN SEARCH REPORT

Application Number  
EP 97 83 0692

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	DE 34 18 602 A (SCHRÖTER & BAKE GMBH & CO. KG.) * abstract; figures 1,4,5 * * page 9, line 9 - line 35 * ---	1	A47B87/02
A	US 5 411 153 A (UNFRIED) * abstract; figures 5-8 * * column 5, paragraph 4 * ---	1,2	
A	US 4 145 977 A (YELLIN) * abstract; figures 1-9 * * column 1, line 41 - column 2, line 59 * ---	1	
A	WO 96 11605 A (HUEBER) * abstract; figures 7-11 * * page 6, last paragraph - page 7, paragraph 1 * ---	1	
A	DE 295 09 084 U (CHANG) * claim 1; figures 2-4 * -----	3,4	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A47B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		2 April 1998	Jones, C
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