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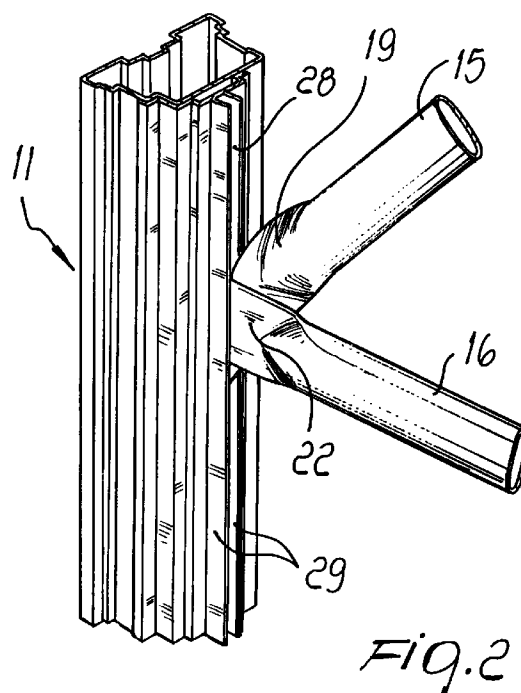
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(54) Set of metal shelves

(57) A set of metal shelves (10), comprising two or more pairs of uprights (11) which are mutually connected by cross-members (15,16) and support stringers (12) which in turn support shelves (13) or equivalent resting means. The cross-members (15,16) are connected to the corresponding uprights (11) by snug interlocking in corresponding through slots (14) formed in the uprights. Two consecutive cross-members (15,16) cooperate for each interlock and the respective ends (17,19,22,24) of the cross-members (11) which are engaged in the interlock are shaped so as to form engagements which have substantially mutually perpendicular planes of arrangement.



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Description

The present invention relates to a set of metal shelves.

Sets of metal shelves are currently widely used and are appreciated for their strength and light weight.

The sets of metal shelves used industrially, commercially and privately also feature a flexibility in configuration which makes them versatile and suitable to meet the most disparate application requirements.

The structure of the sets of metal shelves used mainly in the industrial field substantially comprises two or more pairs of uprights which are mutually connected by cross-members and support stringers which in turn support the shelves.

The uprights and the respective cross-members are mutually coupled by means of bolts or rivets.

Although these coupling methods are per se effective, they entail long times for the assembly and disassembly of the set of shelves.

The assembly and disassembly or modification of conventional sets of shelves also entail the use of specific tools and sometimes of specialized personnel, further increasing the costs.

A principal aim of the present invention is to provide a set of metal shelves in which the connections, particularly between the uprights and the respective cross-members, occur without the aid of bolts or rivets.

Within the scope of this aim, an object of the present invention is to provide a connection between the upright and the respective cross-members which is stable, reliable over time and has good mechanical characteristics as regards structural strength.

Another object of the present invention is to provide a set of shelves for which the assembly and disassembly operations are quick and easy to perform and therefore can be carried out by personnel having no particular specialization.

Another object of the present invention is to provide a set of shelves having competitive costs with respect to those of conventional sets of shelves.

Another object of the present invention is to provide a set of shelves which can be manufactured with conventional technologies and whose components can be easily mass-manufactured.

This aim, these objects, and others which will become apparent hereinafter are achieved by a set of metal shelves comprising at least two pairs of uprights which are mutually connected by cross-members and support stringers which in turn support shelves or equivalent resting means, said set of shelves being characterized in that said cross-members are connected to the corresponding uprights by snug interlocking in corresponding through slots formed in said uprights, two consecutive cross-members cooperating for each interlock, the respective ends of said cross-members which are engaged in the interlock being shaped so as to form engagements which have sub-

stantially mutually perpendicular planes of arrangement.

Further characteristics and advantages of the present invention will become apparent from the following detailed description of an embodiment and of variations thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a perspective view of a set of shelves having the structure according to the invention;

figure 2 is a perspective view of a detail of the set of shelves of figure 1;

figure 3 is a sectional view of the detail of figure 2;

figure 4 is a sectional view of another detail of the set of shelves of figure 1;

figure 5 is an elevational sectional view of the detail of figure 2;

figures 6 and 7 are views of another detail of the set of shelves of figure 1;

figures 8 and 9 are views of still another detail of the set of shelves of figure 1;

figure 10 is a sectional view of another detail of the set of shelves of figure 1;

figures 11, 12 and 13 are sectional views of different embodiments of the detail of figure 10.

With particular reference to figures 1 to 10, a set of metal shelves, structured according to the invention, is generally designated by the reference numeral 10.

The set of shelves 10, in this case, comprises two pairs of uprights 11 which are mutually connected by cross-members, described hereinafter, and support stringers 12 which in turn support shelves 13.

Said cross-members are connected to the corresponding uprights 11 by simple interlocking in corresponding slots 14 formed in series arranged vertically on each one of the uprights 11.

In this embodiment, a first cross-member 15, arranged at an angle upon assembly, and a second cross-member 16, arranged horizontally upon assembly, cooperate by mutual interference for each interlock.

The cross-members 15 and 16 engaged in a same interlock are therefore consecutive; in one of said cross-members, the end which is engaged in the interlock is shaped so as to form an engagement which has a substantially vertical plane of arrangement, whilst in the other cross-member, the end which is engaged in the interlock is shaped so as to form an engagement which has a substantially horizontal arrangement.

More specifically, each one of the first cross-members 15 has a first end 17 which is flattened and shaped so as to form two lugs 18 with an L-shaped profile which lies, upon assembly, on a horizontal plane and is suitable to ensure horizontal engagement.

Each one of the first cross-members 15 furthermore has a second flattened end 19 which lies opposite to the first end 17 and in this case is shaped so as to form an L-shaped lug 20, whose profile lies on a vertical

plane upon assembly, and a guiding flap 21.

Each one of the second cross-members 16 has a first flattened end 22 which is shaped so as to form two lugs 23 which are shaped so that they have an L-shaped profile which lies on a horizontal plane upon assembly and is suitable to produce engagement on said plane.

Furthermore, each one of the second cross-members 16 has a second flattened end 24 which is shaped so as to form an L-shaped lug 25, whose profile lies on a vertical plane upon assembly and is suitable to provide an engagement on said plane, and a guiding lug 26.

Upon assembly, therefore, interlocking in the corresponding slots 14 occurs alternately and respectively between a first end 17 of a first cross-member 15 and a second end 24 of a second cross-member 16, and between a second end 19 of a first cross-member 15 and a first end 22 of a second cross-member 16.

In this case, both the first cross-members 15 and the second cross-members 16 are tubular and the flattened and shaped ends are provided by cropping and plastic deformation so as to form the corresponding lugs.

The set of shelves 10 further comprises L-shaped shims 27 which are suitable to enter a slot 14 if there is provided a first cross-member 15 or a second cross-member 16 without the subsequent cross-member.

The stability of the interlocks of the set of shelves 10 is increased further by the provision, on each one of the uprights 11, of a longitudinally arranged seat 28 on the bottom whereof the slots 14 are formed.

More specifically, in this case each one of the uprights 11 is shaped so as to form two longitudinally-arranged wings 29 which are mutually parallel and suitable to form the seat 28.

Figure 11 illustrates a different embodiment of the seat 28, which in this case is formed in cooperation by two wings 30 with a cavity 31.

With particular reference to figure 12, another embodiment of the seat 28 is shown which provides, at each one of the uprights 11, for the formation of a longitudinally-arranged cavity 32, on the bottom whereof the slots 14 are formed.

Finally, figure 13 illustrates another embodiment, in which a cavity 33 is provided which is equivalent to the previous cavity 32 but is obtained by bending the sheet metal several times and therefore has structurally stronger walls.

In practice, it has been observed that the present invention achieves the intended aim and objects.

In particular, it should be noted that the set of shelves according to the present invention is entirely free from connecting elements such as bolts or rivets.

Moreover, the assembly of the set of shelves according to the present invention is very quick and simple and can be performed even by nonspecialized personnel.

The mutual positioning of the cross-members is in fact substantially guided by the structure of the cross-members and by particular provisions in the shaping of the uprights.

It should also be noted that the set of shelves according to the present invention is, as a whole, highly flexible and suitable to meet the most disparate application requirements.

However, its flexibility and easy assembly, as well as the elimination of the above-mentioned connections by means of bolts or rivets, have no negative effect on the good overall structural strength.

The present invention is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may also be replaced with other technically equivalent elements.

The materials as well as the dimensions may be any according to requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

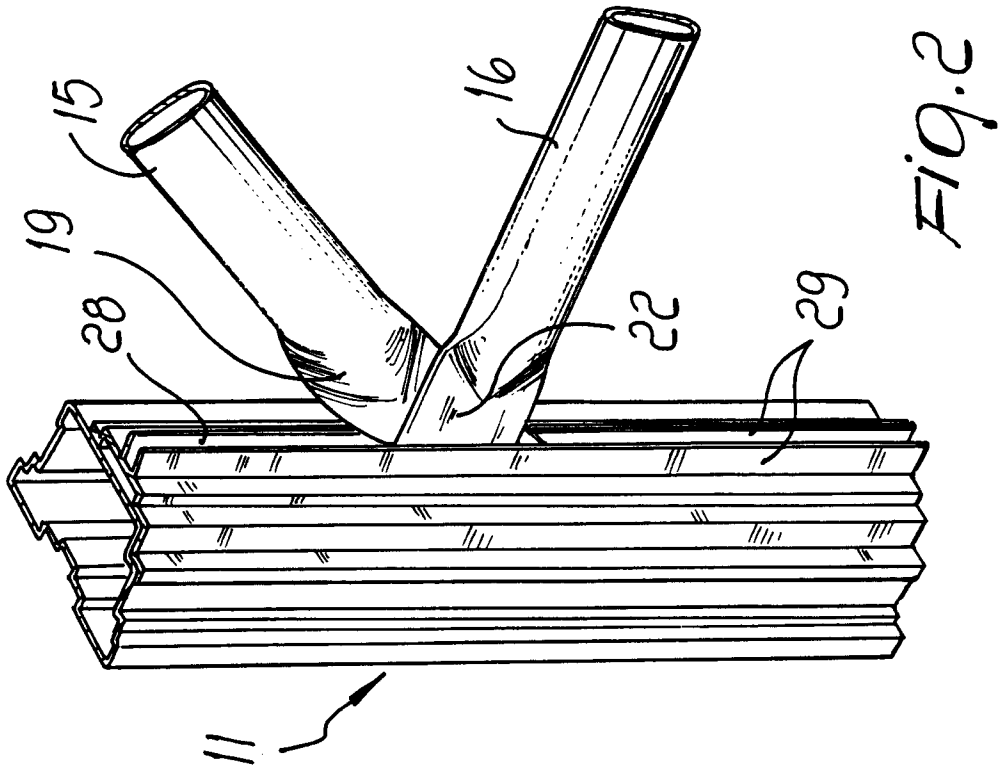
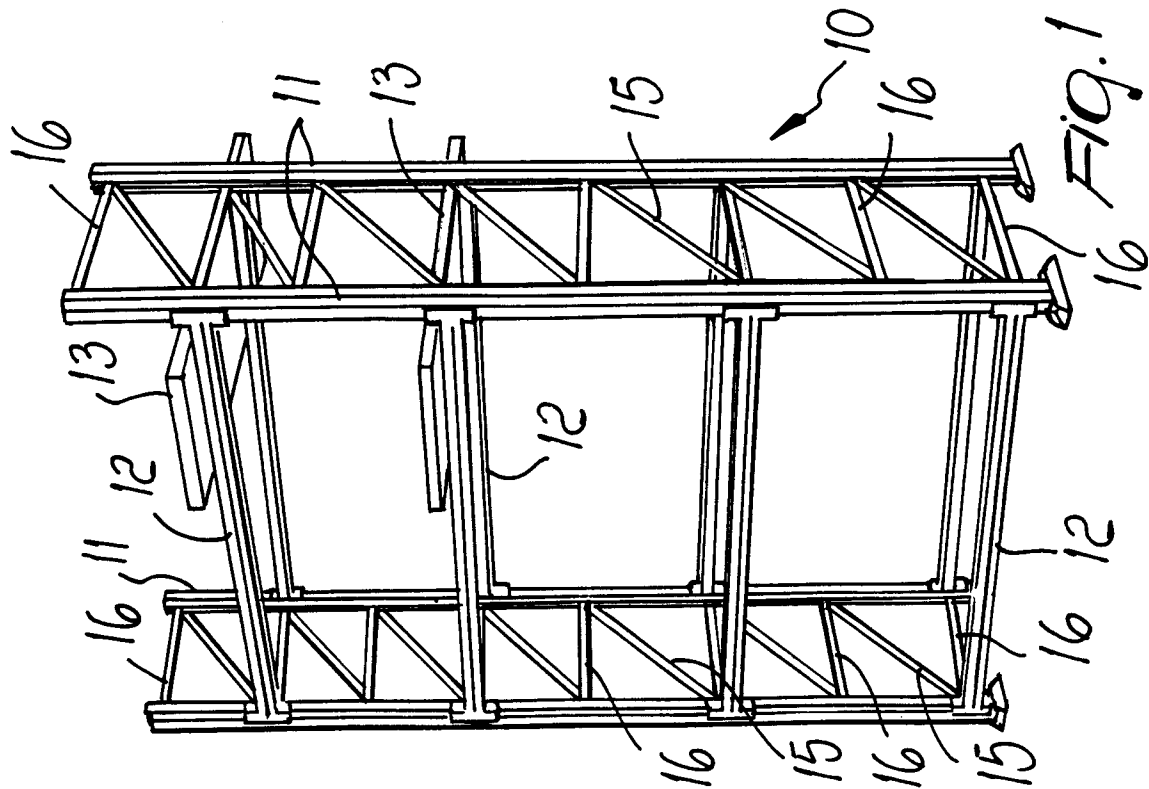
Claims

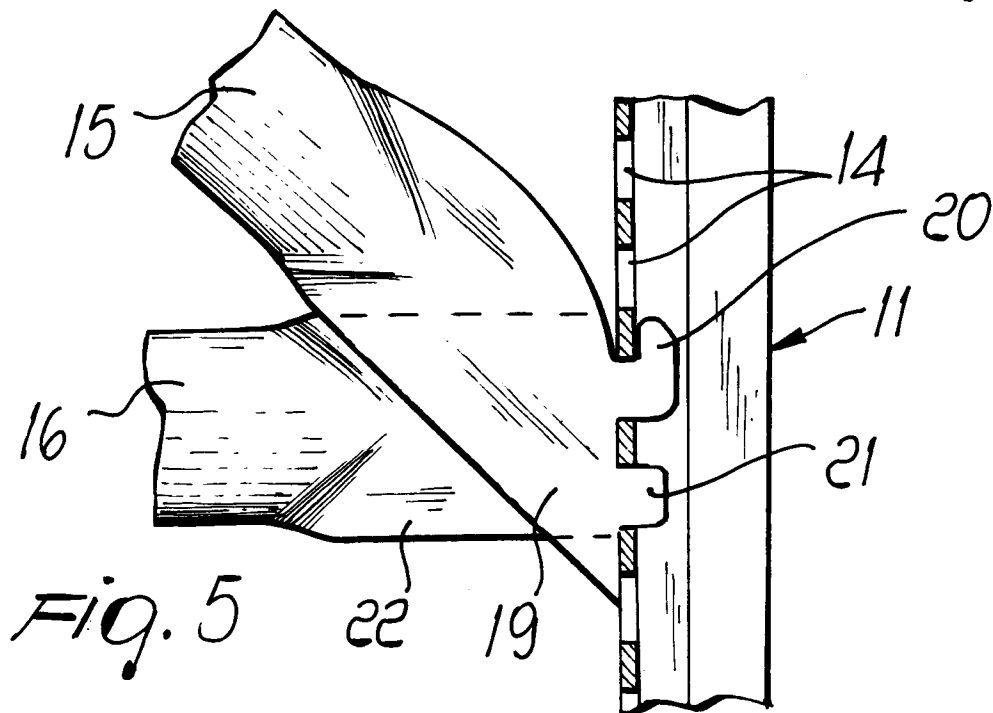
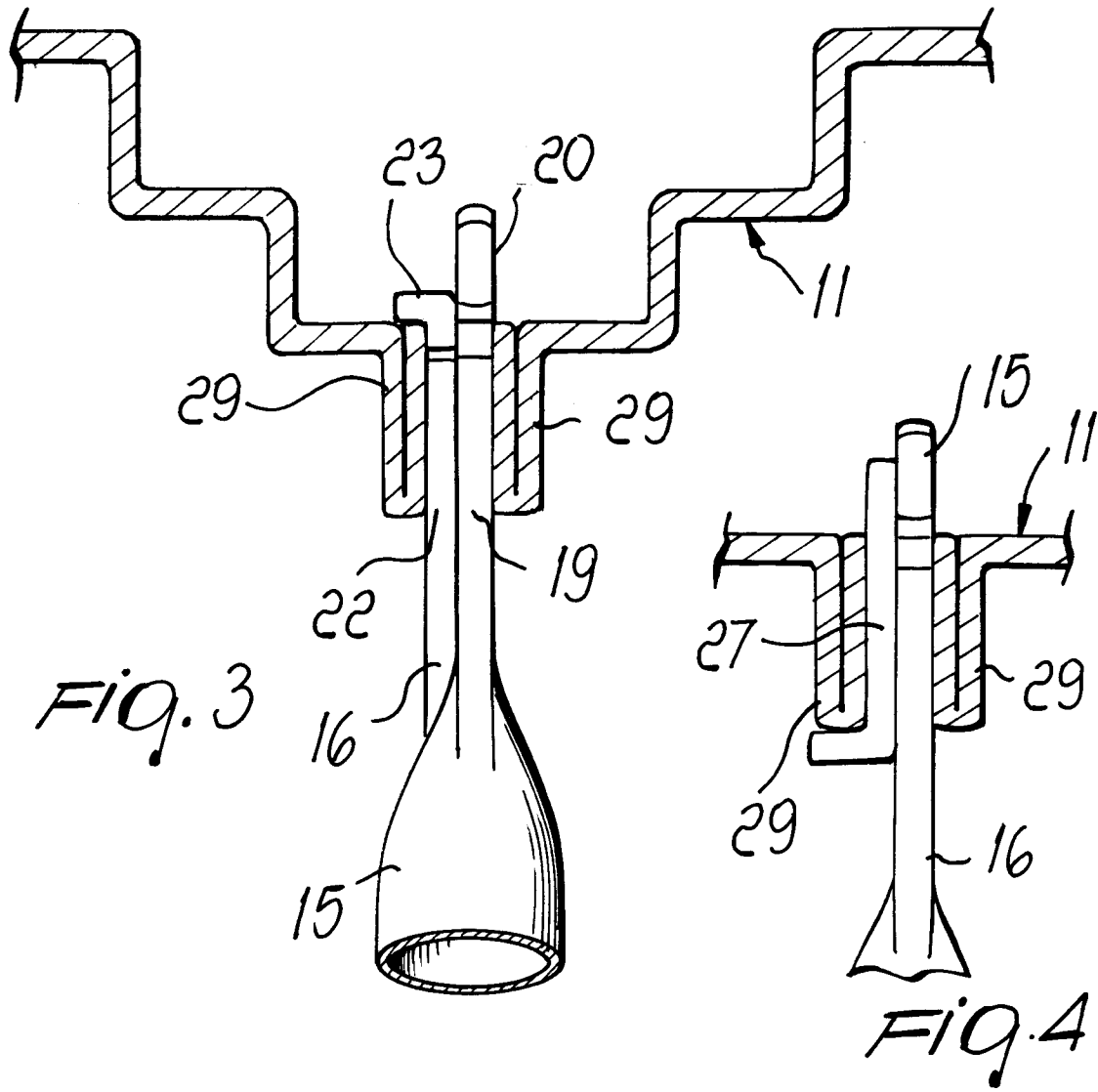
1. A set of metal shelves, comprising at least two pairs of uprights which are mutually connected by cross-members and support stringers which in turn support shelves or equivalent resting means, said set of shelves being characterized in that said cross-members are connected to the corresponding uprights by snug interlocking in corresponding through slots formed in said uprights, two consecutive cross-members cooperating for each interlock, the respective ends of said cross-members which are engaged in the interlock being shaped so as to form engagements which have substantially mutually perpendicular planes of arrangement.
2. A set of shelves according to claim 1, characterized in that each one of the uprights is shaped so as to form a longitudinally arranged seat on the bottom whereof said slots are formed.
3. A set of shelves according to claim 2, characterized in that each one of said uprights is shaped so as to form two mutually parallel longitudinally-arranged wings which form said seat.
4. A set of shelves according to claim 2, characterized in that each one of the uprights is shaped so as to form a longitudinally-arranged cavity which forms said seat.
5. A set of shelves according to claim 2, characterized

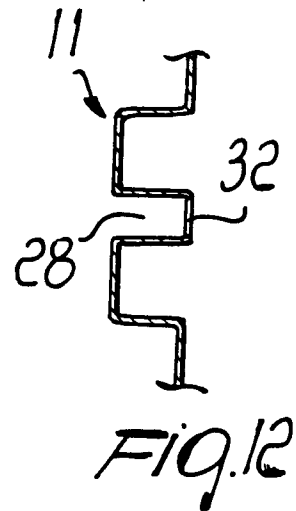
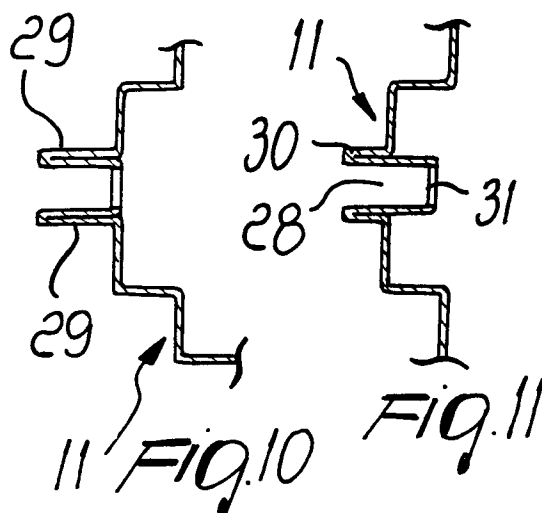
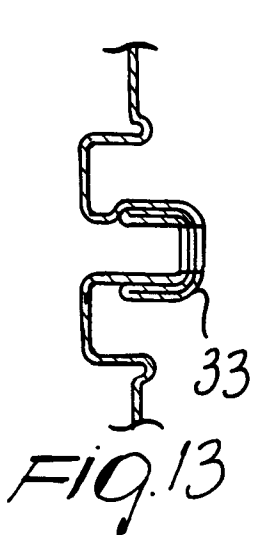
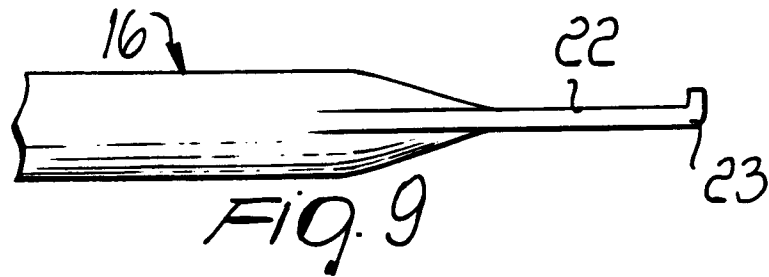
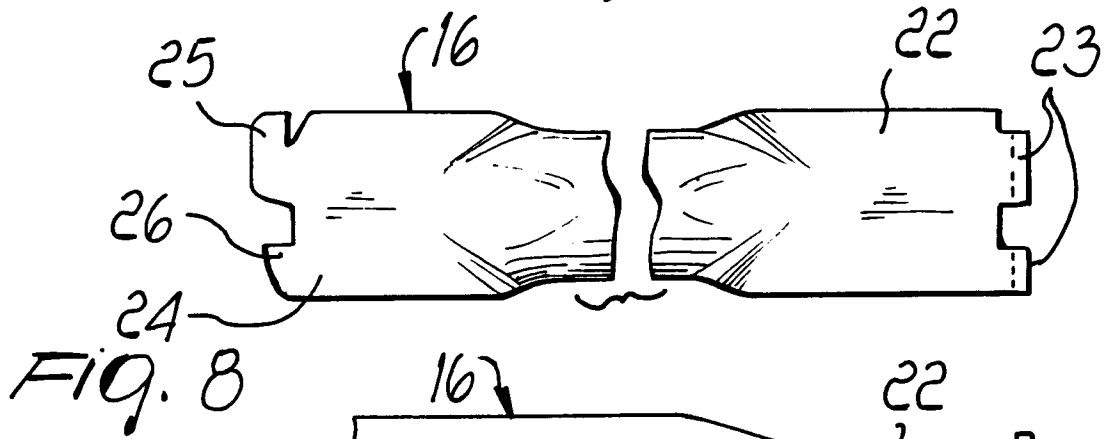
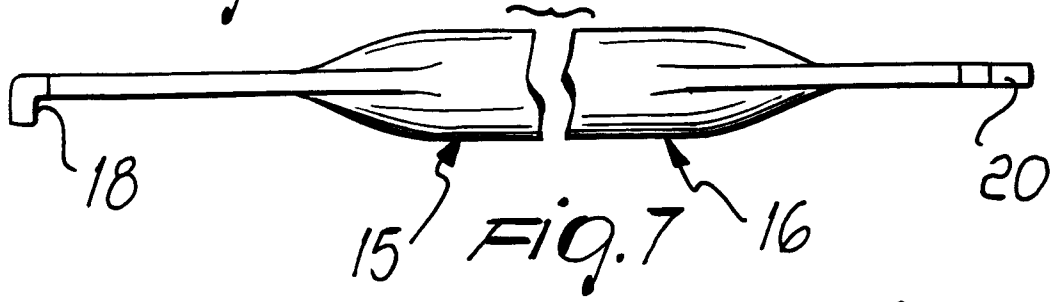
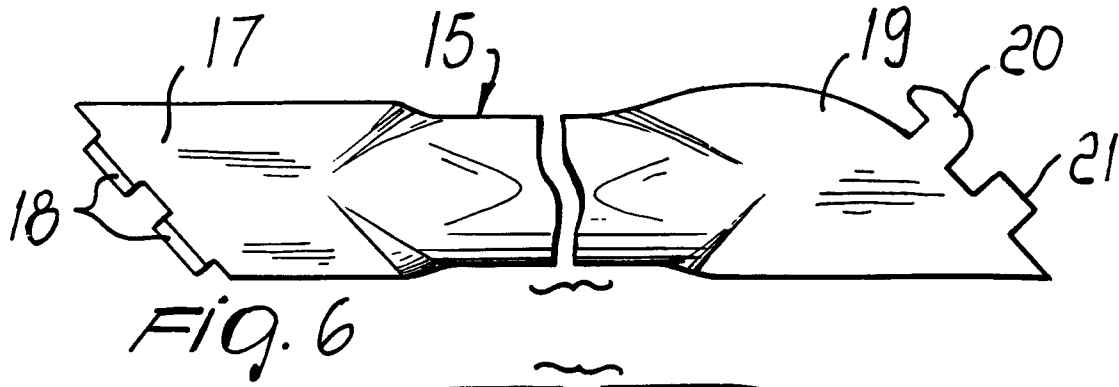
in that each one of said uprights is shaped so as to form two wings and, at said wings, a cavity which cooperates to form said seat.

6. A set of shelves according to claim 1, characterized in that a first one of said consecutive cross-members which cooperate in the interlock comprises a first flattened end, which is shaped so as to form a horizontal engagement, and a second flattened end, which is shaped so as to form a vertical engagement. 5 10
7. A set of shelves according to claim 6, characterized in that said first end comprises at least one lug which is folded so as to be L-shaped and whose profile lies on a horizontal plane upon assembly. 15
8. A set of shelves according to claim 6, characterized in that said second end comprises an L-shaped lug whose profile is arranged vertically upon assembly. 20
9. A set of shelves according to claim 8, characterized in that said second end comprises a guiding lug.
10. A set of shelves according to claim 6, characterized in that a second one of said consecutive cross-members which cooperate in the interlock comprises a first flattened end which is shaped so as to form a horizontal engagement and a second flattened end which is shaped so as to form a vertical engagement. 25 30
11. A set of shelves according to claim 10, characterized in that said first end comprises at least one lug which is folded so as to be L-shaped with a profile which lies on a horizontal plane upon assembly. 35
12. A set of shelves according to claim 10, characterized in that said second end comprises an L-shaped lug whose profile is arranged on a vertical plane upon assembly. 40
13. A set of shelves according to claim 12, characterized in that said second end comprises a guiding lug. 45
14. A set of shelves according to one or more of the preceding claims, characterized in that it comprises locking shims for a said first cross-member or a said second cross-member when the subsequent cross-member is not present. 50

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EUROPEAN SEARCH REPORT

Application Number
EP 97 11 0493

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)
A	EP 0 112 309 A (ELECTROLUX CONSTRUCTOR AKTIEBOLAG) * abstract; claim 1; figures 1-5 * ---	1,4	A47B47/02 A47B96/00
A	BE 661 864 A (BAU-STAHLGeweBE G.M.B.H.) * page 1; figure 1 * * page 3, line 23 - line 25; figure 6 * * page 3, line 32 - page 4, line 2 * ---	1	
A	EP 0 173 985 A (AKTIESELSKABET LAUR. KNUDSEN NORDISK ELEKTRICITETS SELSKAB) -----		
			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		18 November 1997	Jones, C
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