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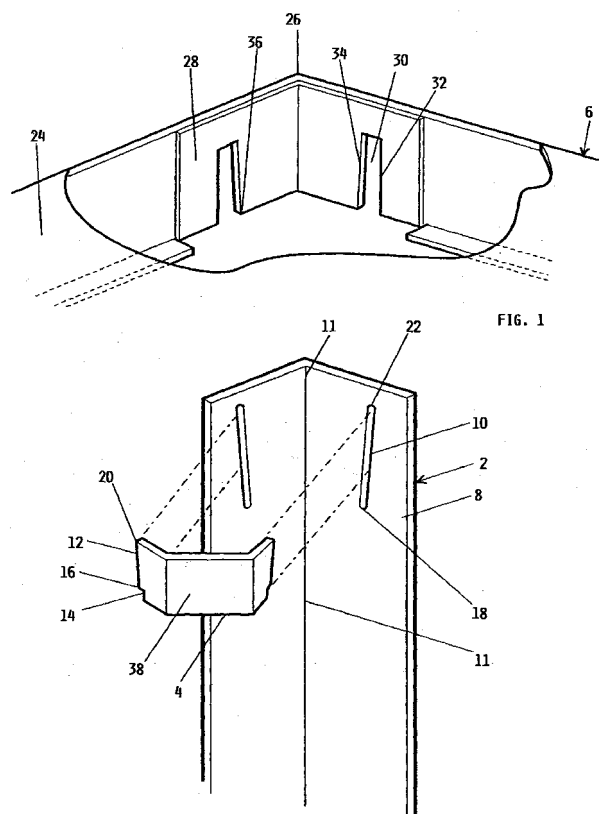
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(54) **Connection system for uprights and shelves in general, in particular for shelving and tables**

(57) A connection system for uprights and shelves in general, characterised by comprising:

- an L-shaped upright (2) comprising in its flanges (8) a plurality of pairs of slots (10) converging downwards towards the corner of the upright,
- a plate (4) shaped as a conical surface portion (12) with its lateral edges having a height less than the length of the slots (10), the distance between the lower corners of the lateral edges (12) corresponding to the distance between the lower edges (18) of the two slots (10), the distance between the upper corners (20) of the lateral edges being less than the distance between the upper edges (22) of the two slots (10), said plate being provided with means (14) for preventing its horizontal movement,
- a bent-edged shelf (6) having in its corner region (26) two notches (30) for its coupling to the plate, that edge (34) of each notch closer to the corner (26) being inclined to an extent substantially equal to the inclination of the slots (10).



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Description

[0001] This invention relates to a connection system for uprights and shelves in general, in particular for shelving and tables.

[0002] Connection systems of insertion type for uprights and shelves are known. A first known system consists of L-shaped uprights drilled for passage of screws for fixing the shelves.

[0003] Another system consists of L-shaped uprights comprising, on their inner surface, hook lugs formed by punching, for engagement by the bent edges of the shelves.

[0004] Another system consists of uprights comprising apertures in which angle pieces rigid with the shelf are engaged by insertion from the outside.

[0005] However these known systems have the drawback of not being easy to clean in the regions in which the shelves are fixed to the uprights because of the presence of the holes, lugs etc., which provide a seat for dirt, dust etc.

[0006] This problem is accentuated in the case of stainless steel shelving and tables for communities such as hospitals and canteens, and the interior of cold rooms.

[0007] An object of the invention is to eliminate these drawbacks by providing a connection system of insertion type in which all the surfaces are smooth.

[0008] A further object of the invention is to provide a system which is free from bolts and welds.

[0009] A further object of the invention is to provide a connection system which is easy to assemble and disassemble.

[0010] A further object of the invention is to provide a connection system which has a large reaction surface with distributed stresses. These and further objects which will be apparent from the ensuing description are attained according to the invention by a connection system from uprights and shelves in general as described in claim 1.

[0011] A preferred embodiment of the invention is described in detail hereinafter with reference to the accompanying drawings, on which:

Figure 1 is an exploded perspective view of the connection system according to the invention,

Figures 2 and 3 shows the assembly stages in perspective view, and

Figure 4 shows shelving obtained using the connection system.

[0012] As can be seen from the figures, the connection system of insertion type according to the invention comprises substantially an angular upright 2, a connection plate 4 and a shelf 6 with bent edges.

[0013] The angular upright 2 comprises in each of its two flanges 8 a plurality of pairs of downwardly con-

verging inclined slots 10. In the illustrated example, the two slots are symmetrical about the vertical corner 11, but uprights with non-symmetrical slots can be used.

[0014] The plate 4, which has a height less than the length of the slots 10, is shaped and faceted such as to form a partial lateral portion of a downwardly converging pyramidal frustum, with its two outer surfaces 12 comprising, in the two lower corners, steps 14 having their horizontal part 16 equal in length to the thickness of the flanges 8 of the upright 2.

[0015] The distance between the two steps 14 corresponds substantially to the distance between the lower edges 18 of the two slots 10, the distance between the upper corners 20 of the two outer surfaces 12 being less than the distance between the upper edges 22 of the two slots 10.

[0016] The shelf 6 has bent edges 24, meeting at corners 26 where reinforcements 28 are provided to ensure indeformability of the corner, which otherwise would not provide structure stability. As an alternative to the reinforcement, a weld could be provided along the corner 26.

[0017] In the bent edges 24 of each there are provided two vertical notches 30 of height greater than the height of the plate 4 but less than the length of the slots 10.

[0018] Each notch 30 has that edge 32 further from the corner 26 substantially vertical and that edge 34 closer to the corner 26 inclined to said corner to an extent substantially equal to the inclination of the slots 10 to the corner 26.

[0019] In addition the distance of the corners 36 of the inclined edges 34 from the corner 26 of the shelf 6 is substantially equal to the distance of the lower edges 18 of the slots 10 from the vertical corner 11 of the upright.

[0020] The shelf is mounted on the upright in the following manner.

[0021] The plates 4 are fitted by firstly inserting the edges of the outer lateral surfaces 12 into the central region of the slots 10, then pushing the plates downwards until the step portions 14 rest on the lower edge 18 of the slots 10.

[0022] In this configuration the two outer surfaces 12 of the plate 4 are inclined at an angle of less than 90° to the corresponding flanges 8 of the upright, with the central portion 38 also converging downwards and all the straight lines lying in the plane of this surface intersecting the flanges 8 of the upright at 45°.

[0023] In practice the structure obtained in this manner is such that the prolongations of the two slots 10 converge towards a point on the vertical corner 11 of the upright 2 which also constitutes the vertex of an ideal trapezoidal pyramid, of which the plate 4 forms part of the lateral surface.

[0024] The connection between the plate 4 and the slots 10 is of high stability, in that the presence of the steps 14 means that the plate cannot undergo any

movement in the horizontal plane which could cause it to disengage from the slots.

[0025] The shelf 6 is then fitted by positioning its corner 26 inside the corner 11 of the upright 2, with the notches 30 straddling the lateral surfaces 12 of the plate 4 and the oblique edges 34 substantially in contact with the inner surface of the lateral portions 12 of the plate to hence increase the stability of the connection obtained.

[0026] From the foregoing it is apparent that the connection system of the invention offers numerous advantages, and in particular:

- it has considerable stability, even though it uses no welds, or fixing elements such as screws, bolts, etc.,
- it can be easily assembled and disassembled,
- it can be cleaned effectively and reliably as it possesses no projecting parts.

[0027] In a modified embodiment, not shown on the drawings, for its connection to the uprights, the plate can have its steps of such a width that its lateral portions project beyond the thickness of the upright.

[0028] This solution should however be avoided, both for aesthetic reasons and for difficulties in cleaning the structure.

[0029] In a further modification the plate can be provided with projections which react with the flanges of the upright.

[0030] In the illustrated embodiment, the angle between the lateral portions 12 of the plate 4 and the flanges 8 of the upright 2 is less than 90°, but the connection could be made using an angle of 90° provided the bent edge of the upright were to be adequately strengthened.

the plate, that edge (34) of each notch closer to the corner (26) being inclined to an extent substantially equal to the inclination of the slots (10).

2. A connection system as claimed in claim 1, characterised in that the plate (4) is faceted in such a manner as to constitute a partial lateral portion of a pyramidal frustum
3. A connection system as claimed in claim 2, characterised in that the plate comprises, in its lower corners, notches (30) for gripping the lower edges (16) of the slots (10).
4. A connection system characterised in that the slots (10) are symmetrical about the vertical corner (11).
5. A connection system as claimed in claim 1, characterised in that the plate surface forms an angle of less than 90° to that flange part between the slot and corner of the upright.
6. A connection system for uprights and shelves in general in particular for shelving and tables, as claimed in claims 1 to 5 and substantially as illustrated and described.

Claims

1. A connection system for uprights and shelves in general, characterised by comprising:

- an L-shaped upright (2) comprising in its flanges (8) a plurality of pairs of slots (10) converging downwards towards the corner of the upright,
- a plate (4) shaped as a conical surface portion (12) with its lateral edges having a height less than the length of the slots (10), the distance between the lower corners of the lateral edges (12) corresponding to the distance between the lower edges (18) of the two slots (10), the distance between the upper corners (20) of the lateral edges being less than the distance between the upper edges (22) of the two slots (10), said plate being provided with means (14) for preventing its horizontal movement,
- a bent-edged shelf (6) having in its corner region (26) two notches (30) for its coupling to

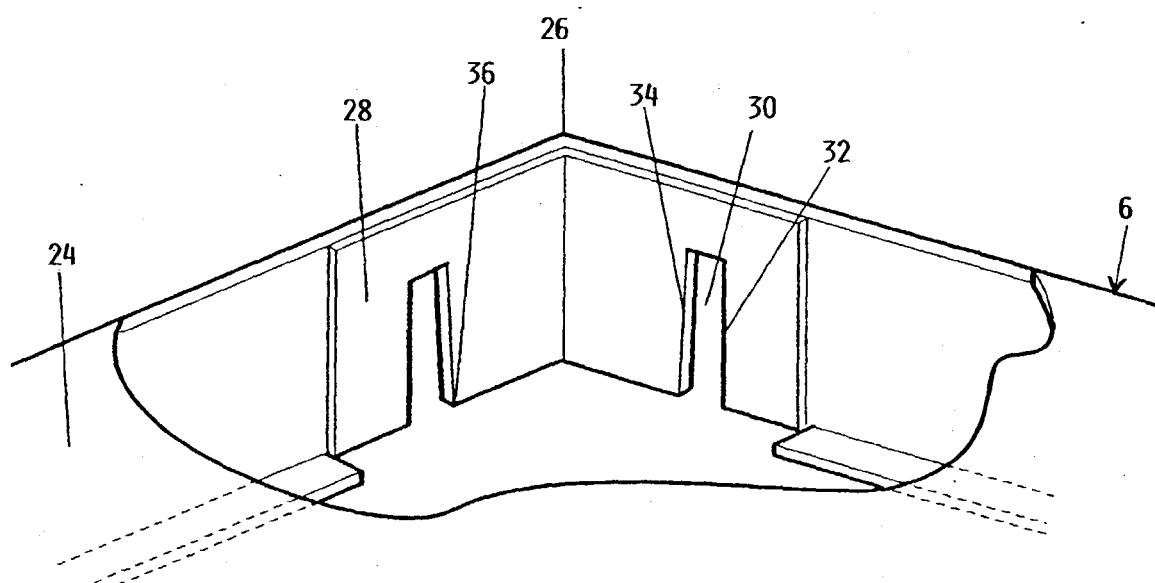


FIG. 1

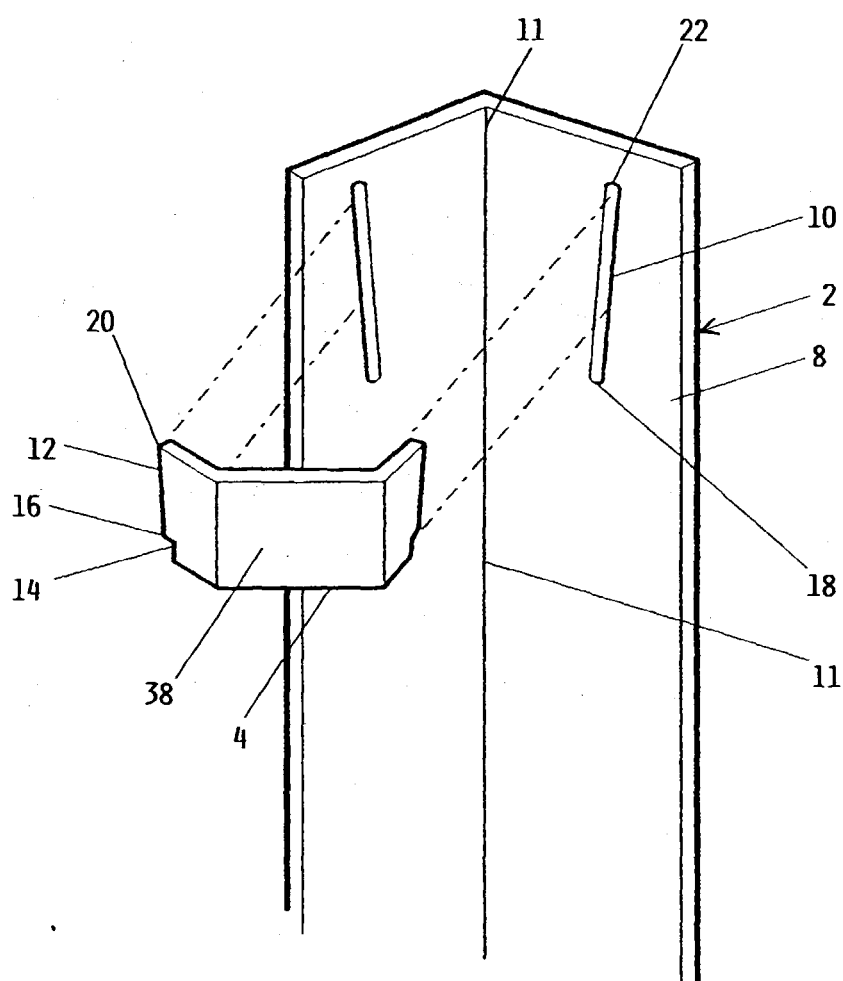


FIG. 2

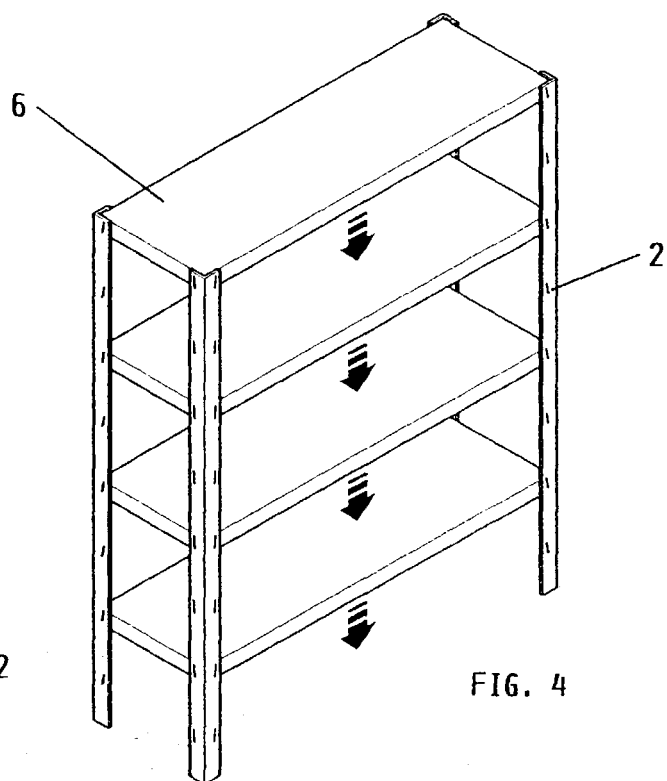
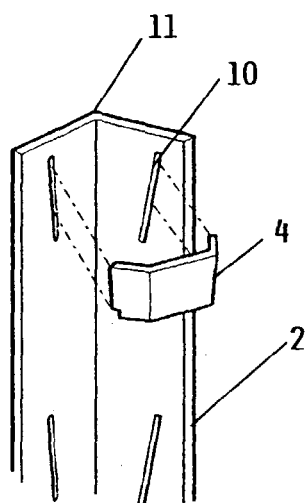


FIG. 4

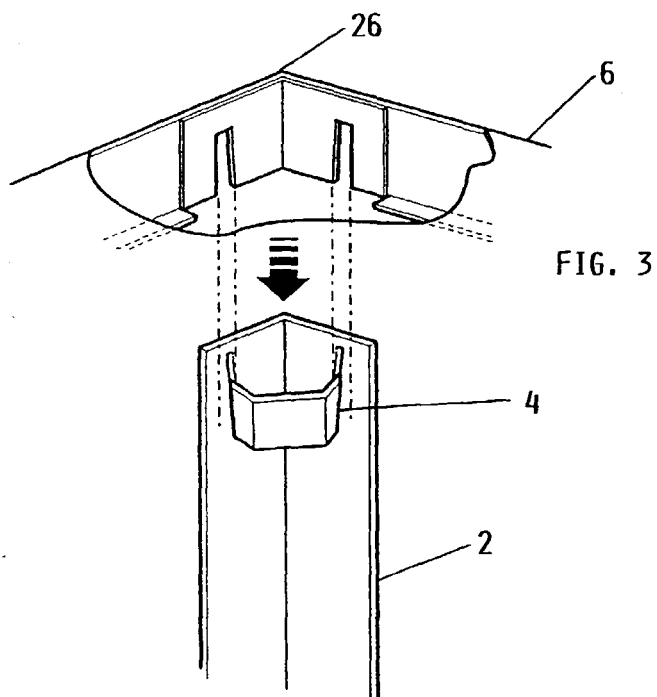


FIG. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 00 10 2687

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.7)
X	FR 1 326 502 A (MALLEZET ALBERT) 14 August 1963 (1963-08-14)	4	A47B57/50
A	* the whole document *	1-3,5	
X	US 3 143 088 A (EVANS ROBERT J.) 4 August 1964 (1964-08-04)	4	
A	* column 1, line 8 - line 12 * * column 3, line 45 - column 4, line 11 * * figures 1,5,6 *	1	
X	EP 0 808 589 A (GS SCAFFALATURE ENGINEERING S) 26 November 1997 (1997-11-26)	4	
A	* column 1, line 3 - line 5 * * column 2, line 53 - column 4, line 6 * * figures 1-5 *	1	
X	WO 93 19642 A (SPACEMAKER LTD) 14 October 1993 (1993-10-14)	4	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	* page 1, line 3 - line 6 * * page 7, line 30 - line 31 * * figures 6-9 *	1	A47B
A	CH 523 039 A (SCHEER ERNST) 31 May 1972 (1972-05-31) * column 1, line 1 - line 3 * * column 2, line 1 - column 4, line 2 * * figures 1-3 *	1,3	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 June 2000	Examiner van Hoogstraten, S
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			

EPO FORM 1503 03.82 (P04C01)

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

EP 00 10 2687

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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16-06-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 1326502 A	14-08-1963	NONE	
US 3143088 A	04-08-1964	NONE	
EP 0808589 A	26-11-1997	IT PD960128 A	21-11-1997
WO 9319642 A	14-10-1993	CA 2064656 A	02-10-1993
		CA 2075320 A	06-02-1994
		AU 675218 B	30-01-1997
		AU 3882193 A	08-11-1993
		DE 69303165 D	18-07-1996
		DE 69303165 T	13-02-1997
		EP 0633742 A	18-01-1995
		JP 7508186 T	14-09-1995
		US 5463966 A	07-11-1995
		US 5553549 A	10-09-1996
CH 523039 A	31-05-1972	NONE	