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(54) Shelving brackets

(57) The invention provides a shelf-supporting bracket (3) for connection to an upright (1) having a plurality of regularly vertically spaced apart slots (7), the bracket (3) comprising:
an upper edge (13) comprising shelf supporting means, and
a mounting edge (15) comprising first, second and third vertical engagement means (27, 39, 35) and first horizontal engagement means (29), the engagement means being arranged so that, when the bracket (3) is connected to an upright (1):
the first vertical engagement means (27) is located within a first slot (7) in the upright (1) and engages the inside surface of the face (5) of the upright (1) to which the bracket (3) is attached above the first slot (7), the area of engagement between the first vertical attachment means (27) and the inside surface of the face (5) of the upright (1) being located above the upper edge (13) of the bracket (3);
the second vertical engagement means (39) is located within a second slot (7) in the upright (1) positioned below the first slot (7) and engages the inside surface of the face (5) of the upright (1) to which the bracket (3) is attached above the second slot (7);
the first horizontal engagement means (24) is located within a third slot (7) in the upright (1) positioned below the second slot (7), and supportingly engages the lower edge (4) of the third slot (7), and
the third vertical engagement means (35) engages the outside surface of the face (5) of the upright (1) to which the bracket (3) is attached below the third slot (7);
and wherein the first horizontal engagement means (29) further comprises means (31) to engage the inside surface of the face (5) of the upright (1) to which the bracket (3) is attached below the third slot (7),
and the first, second and third slots (7) engaged by the bracket (3) are consecutive slots (7).

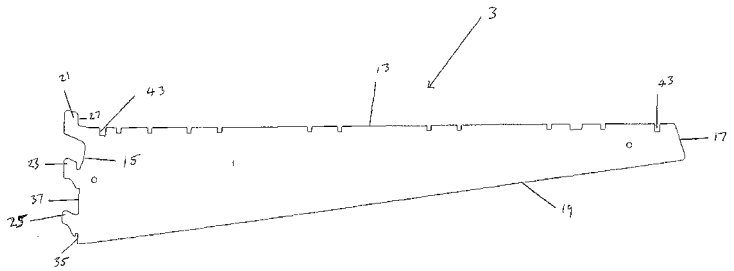

Figure 2

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Description

Field of the Invention

[0001] The invention relates to brackets for connecting shelves to uprights in modular shelving systems, particularly to brackets having improved weight bearing capacities.

Background of the Invention

[0002] Modular shelving systems are used widely for domestic and commercial storage and in the retail trade, particularly throughout supermarkets. Many such systems are constructed from variable numbers of three primary components, i.e two or more uprights, one or more shelving panels and two or more shelf-supporting brackets that hook into slots in the uprights.

[0003] Uprights for use in modular shelving systems may be freestanding or wall-mounted, and are usually rectangular section hollow bars of which the front faces have been provided with a series of slots, spaced at fixed intervals along the length of the uprights, and into which the hooks of the shelf-supporting brackets mount. Generally the slots are spaced at fixed intervals, commonly with a spacing (or pitch) of 50mm. For conventional systems the spacing of the slots in the upright is a determinant of the vertical spacing between shelves mounted thereto. Brackets for use with such uprights usually comprise two or more mounting hooks for engaging the slots in the uprights. These hooks may either all engage the lower edges of their respective slots (known as "down-hooking" brackets) or may all engage the upper edges of their respective slots (commonly known as "up-hooking" brackets). Brackets may also have combinations of hooks, some of which engage the lower edges of their slots whilst others engage the upper edges of their slots. In most cases the hooks will be arranged to engage consecutive slots in an upright.

[0004] One means for increasing the load bearing capacity of brackets for use in modular shelving systems is to increase the number of slots engaged by the brackets. In general this is done by increasing the number of hooks provided on each bracket, for example, brackets having three hooks for engaging an upright are generally stronger than brackets having two upright engaging hooks, and brackets having four upright engaging hooks are generally stronger than brackets having three upright engaging hooks. However, increasing the number of hooks on a bracket normally results in an increase in the minimum vertical spacing between the shelves that can be attached by the brackets. For example, in modular systems comprising uprights having a conventional slot spacing of 50mm, brackets having 3 slot engaging hooks may be used to attach shelves with a minimum spacing of 150mm, whereas the minimum spacing for shelves attached to the uprights by using brackets having four upright attaching hooks is 200mm.

Summary of the Invention

[0005] The present invention provides a shelf-supporting bracket for connection to an upright having a plurality of regularly vertically spaced apart slots, the bracket comprising:

an upper edge comprising shelf supporting means, and a mounting edge comprising first, second and third vertical engagement means and first horizontal engagement means, the engagement means being arranged so that, when the bracket is connected to an upright:
the first vertical engagement means is located within a first slot in the upright and engages the inside surface of the face of the upright to which the bracket is attached above the first slot, the area of engagement between the first vertical attachment means and the inside surface of the face of the upright being located above the upper edge of the bracket;
the second vertical engagement means is located within a second slot in the upright positioned below the first slot and engages the inside surface of the face of the upright to which the bracket is attached above the second slot;
the first horizontal engagement means is located within a third slot in the upright positioned below the second slot, and supportingly engages the lower edge of the third slot, and
the third vertical engagement means engages the outside surface of the face of the upright to which the bracket is attached below the third slot;
and wherein the first horizontal engagement means further comprises means to engage the inside surface of the face of the upright to which the bracket is attached below the third slot,
and the first, second and third slots engaged by the bracket are consecutive slots.

[0006] The provision of means to engage the inside surface of the face of the upright to which the bracket is attached below the third slot helps to prevent brackets of the invention being accidentally removed from the uprights to which they are attached. In a preferred embodiment, the first horizontal engagement means is in the form of an attachment hook located on the mounting edge of the bracket and having a notch in its lower surface so that, when the bracket is attached to an upright, the notch cooperates with the lower edge of the slot in which it is inserted, to support the bracket and also to prevent its accidental removal from the upright.

[0007] In preferred brackets of the invention the first vertical attachment means is arranged in the form of a hook located on the mounting edge of the bracket, and extending above the upper edge of the bracket.

[0008] Preferably, the third vertical engagement means of brackets of the present invention is arranged so that, when the bracket is attached to an upright, it

engages the outside surface of the upright at a position substantially immediately below the third slot. Most preferably, the third vertical engagement means is formed by the mounting edge of the bracket extending below the first horizontal engagement means.

[0009] In preferred brackets according to the present invention, the mounting edge comprises a fourth vertical engagement means positioned between the second vertical engagement means and the first horizontal engagement means so that, when the bracket is attached to an upright, the fourth vertical engagement means engages the outside surface of the face of the upright to which the bracket is attached. In such preferred brackets, the fourth vertical engagement means is preferably a vertical surface of the mounting edge of the bracket. Most preferably, the fourth vertical engagement means engages the outside surface of the upright immediately above the slot engaged by the first horizontal engagement means.

[0010] In further preferred brackets according to the present invention, the mounting edge comprises a second horizonal engagement means positioned between the second vertical engagement means and the first horizontal engagement means so that, when the bracket is attached to an upright, the second horizontal engagement means supportingly engages the lower edge of the second slot in the upright in which the second vertical engagement means is located.

[0011] In a particularly preferred embodiment of a bracket of the present invention, the second vertical engagement means and the second horizontal engagement means are provided in the form of a hook mounted on the mounting edge of the bracket. The hook comprises a notch located in its upper surface, the notch having a vertical surface for engaging the inside surface of the face of the upright to which the bracket is attached at a position above the slot into which the hook is inserted. The hook also comprises a horizontal surface at the bottom of the hook which rests upon the lower edge of the slot into which the hook is positioned.

[0012] Brackets according to the present invention generally have load-bearing capacities that are similar to or exceed the load-bearing capacities of conventional brackets having four slot engaging hooks, but may be connected to uprights with the minimum spacing normally provided only by brackets having three slot engaging hooks.

[0013] Brackets according to the present invention are easy to connect to uprights, and in particular it is not necessary for the brackets to be tilted to extreme angles to allow the vertical and horizontal engagement means to be inserted into appropriate slots in an upright, thus permitting preferred brackets according to the invention to be connected to an upright immediately below a previously connected bracket if required.

[0014] Brackets of the present invention may be of any suitable size or shape. Preferred brackets of the present invention are elongated generally triangular plates. Most preferably in brackets of the present invention, the mounting edge is generally connected to one end of the upper edge and is generally perpendicular thereto. In such preferred brackets the forward edge of the bracket opposite to the mounting edge is a vertical or forwardly sloping edge having a length significantly shorter than the length of the mounting edge, so that the lower edge of the bracket opposing the upper edge slopes upwardly from the mounting edge towards the forward edge of the bracket.

[0015] Lengths of the upper edges of brackets of the present invention may vary from approximately 250mm to 1000mm, preferably from 400 to 800mm, more preferably from 550 to 700mm, for example 670mm.

[0016] Suitable lengths for the mounting edges of brackets of the present invention will generally depend upon the number of slots that are to be engaged by the brackets, and the spacing of the slots in the uprights to which they are to be attached.

[0017] Brackets according to the present invention preferably further comprise shelf engaging means. The shelf engaging means may include slots in the upper edges of the brackets.

[0018] Brackets according to the present invention preferably have widths of from 2 to 3.5mm, more preferably from 2.5 to 3mm, most preferably 3mm.

[0019] Brackets according to the present invention may be made from any suitable materials, including metals, plastics and composite materials. Suitable metals include steel, particularly high tensile micro alloy steel.

[0020] The present invention also provides shelves to which are attached two or more brackets of the present invention. Such shelves may be attached directly to slotted uprights.

[0021] The present invention also provides a modular shelving system comprising a plurality of uprights having a plurality of regularly spaced apart slots and further comprising a plurality of brackets and/or shelves of the present invention.

Detailed Description of the Invention

[0022] An embodiment of the present will now be described by way of example with reference to the drawings in which:

Figure 1 is a front view of a conventional shelving upright for use with brackets of the present invention;

Figure 2 is a side view of a preferred embodiment of a shelving bracket according to the present invention;

Figure 3 is a detailed view of the mounting edge of the bracket shown in Figure 2, and

Figure 4 is a sectional view showing the mounting edge of a first bracket as shown in Figure 2 attached to an upright as shown in Figure 1, and also showing

part of a second bracket as shown in Figure 2 attached to the upright below the first bracket.

[0023] Figure 1 shows a conventional upright for use with a bracket of the present invention. The upright 1 is a hollow steel bar having a rectangular cross section. The front face 5 of the upright comprises a vertical series of upright slots 7 each slot 7 having a height of 28mm, and the land 8 between each slot 7 being 22mm. Each slot 7 has a lower edge 9 and an upper edge 11.

[0024] As shown in Figure 2, an embodiment of a bracket 3 of the present invention has the appearance of a substantially flat generally triangular plate. The bracket 3 is made of a high tensile micro alloy steel and has a thickness of 3mm. The bracket has an upper edge 13, and a mounting edge 15 which is generally perpendicular to the upper edge 13. The bracket 3 also comprises a front edge 17 at the opposite end of the bracket 3 to the mounting edge 15. The front edge 17 slopes forwardly from the upper edge 13 and is of substantially shorter length than the mounting edge 15. A lower edge 19 joins the mounting edge 15 to the front edge 17. The upper edge 13 of the bracket 3 comprises various shelf engaging means 43.

[0025] The total length of the bracket 3 from the mounting edge 15 to the front edge 17 where it meets the upper edge 13 is 670mm.

[0026] The mounting edge 15 of the bracket 3 comprises an upper attachment lug 21, a middle attachment lug 23 and a lower attachment lug 25.

[0027] As shown in more detail in Figures 3 and 4, the upper attachment lug 21 comprises a first vertical face 27 which, when the bracket 3 is attached to an upright 1, engages the inner surface of the land 8 above the slot 7 into which the upper attachment lug 21 has been inserted. When the bracket 3 is attached to an upright 1, the upper attachment lug 21 does not engage the lower edge 9 nor the upper edge 11 of the slot 7 into which it has been inserted.

[0028] Also as shown in Figures 3 and 4, the lower attachment lug 25 comprises a first horizontal surface 29 which, when the bracket 3 is attached to an upright, engages the lower edge 9 of the slot 7 into which the lower attachment lug 25 is inserted. The lower attachment lug 25 also comprises a tab 33 having a vertical surface 31 which engages the inner surface of the land 8 below the slot 7 when the first horizontal surface 29 is resting on the lower edge 9 of the slot 7. The tab 31 prevents the bracket 3 from moving forwards with respect to the upright 1 when it is located in the slot 7 of the upright 1, and will therefore help to prevent the bracket 3 from being accidentally knocked from the upright 1.

[0029] As shown in more detail in Figures 3 and 4, the middle attachment lug 23 comprises a second vertical face 39 which, when the bracket 3 is attached to an upright 1, engages the inside surface of the land 8 above the slot 7 into which the middle attachment lug 23 is inserted. The middle attachment lug 23 also comprises a second horizontal surface 41 which supportingly engages the lower edge 9 of the slot 7 into which the middle attachment lug 23 is inserted.

[0030] The mounting edge 15 of the bracket 3 also comprises a third vertical face 35 which, when the lower attachment lug 25 is located in a slot 7 in an upright 1, engages the outer surface of the land 8 immediately below the slot 7 engaged by the lower attachment lug 25.

[0031] The mounting edge 15 of the bracket 3 also comprises a fourth vertical face 37 located between the middle attachment lug 23 and the lower attachment lug 25. When the bracket 3 is attached to an upright 1, the fourth vertical face 37 engages the outer surface of the land 8 between the slots 7 engaged by the middle attachment lug 23 and the lower attachment lug 25.

[0032] Thus, when the bracket 3 is attached to an upright 1, the upper attachment lug 21, middle attachment lug 23 and lower attachment lug 25 will be inserted into 3 consecutive slots 7, first horizontal surface 29 and second horizontal surface 41 will each supportingly engage with the lower edges 9 of their respective slots 7, the first vertical face 27 and second vertical face 39 will each engage the inside surface of the land 8 above the slots 7 engaged by the upper attachment lug 21 and the middle attachment lug 23 respectively, and the third vertical face 35 and fourth vertical face 37 will each engage the outer surface of the land 8 respectively below and above the slot 7 engaged by lower attachment lug 25. The vertical surface 33 of the tab 31 will also engage the inner surface of the land 8 immediately below the slot 7 into which the lower attachment lug 25 is inserted.

[0033] The bracket 3 shown in Figures 1 to 4 is capable of supporting loads equivalent to conventional brackets having four hooked attachment means; however, as shown in Figure 4, when brackets 3 according to this embodiment are attached above each other to an upright 1, the lower attachment lug 25 of a first bracket 3 may be located in a slot 7 immediately above a slot 7 engaged by the upper attachment lug 21 of a second bracket 3 positioned below the first bracket 3, and therefore, when the pitch of the upright 1 is 50mm, the spacing between the shelves may as small as 150mm (the minimum spacing would be 200mm for conventional brackets having four hooks).

[0034] The bracket 3 shown in figures 1 to 4 is particularly convenient for attaching to conventional uprights 1. In particular, the bracket 3 does not need to be tilted at an extreme angle in order to be attached to an upright. Thus, in order to attach a bracket 3 to an upright 1, the bracket 3 may be held adjacent to the upright 1 and generally perpendicular thereto. The front edge 17 may then be elevated slightly, and the upper 21 and middle 23 attachment lugs inserted into two consecutive slots 7 in the upright 1. The front edge 17 may then be lowered so that the lower attachment lug 25 enters its corresponding slot 7, and the bracket 3 may be lowered slightly so that the first horizontal surface 29 and the second horizontal surface 41 each engage the lower edges 9 of their respective

slots 7. In this position, the first vertical face 27 and second vertical face 39 will each respectively engage the inside surface of the upright 1 above the slots 7 engaged by the upper attachment lug 21 and the middle attachment lug 23, and the third vertical face 35 and fourth vertical face 37 will respectively each engage the outer surface of the upright 1 below and above the slot 7 engaged by the lower attachment lug 25. The vertical surface 33 of the tab 31 will also engage the inner surface of the upright 1 immediately below the slot 7 into which the lower attachment lug 25 is inserted. This will allow the bracket 3 to be inserted into an upright 1 immediately below a second bracket 3 already attached to the upright 1. Similarly, the bracket 3 may be easily removed from an upright 1 without the need to also remove a further bracket 3 attached immediately above it.

Claims

1. A shelf-supporting bracket (3) for connection to an upright (1) having a plurality of regularly vertically spaced apart slots (7), the bracket (3) comprising:

an upper edge (13) comprising shelf supporting means, and
a mounting edge (15) comprising first, second and third vertical engagement means (27, 39, 35) and first horizontal engagement means (29), the engagement means being arranged so that, when the bracket (3) is connected to an upright (1):
the first vertical engagement means (27) is located within a first slot (7) in the upright (1) and engages the inside surface of the face (5) of the upright (1) to which the bracket (3) is attached above the first slot (7), the area of engagement between the first vertical attachment means (27) and the inside surface of the face (5) of the upright (1) being located above the upper edge (13) of the bracket (3);
the second vertical engagement means (39) is located within a second slot (7) in the upright (1) positioned below the first slot (7) and engages the inside surface of the face (5) of the upright (1) to which the bracket (3) is attached above the second slot (7);
the first horizontal engagement means (24) is located within a third slot (7) in the upright (1) positioned below the second slot (7), and supportingly engages the lower edge (4) of the third slot (7), and
the third vertical engagement means (35) engages the outside surface of the face (5) of the upright (1) to which the bracket (3) is attached below the third slot (7);
and wherein the first horizontal engagement means (29) further comprises means (31) to engage the inside surface of the face (5) of the upright (1) to which the bracket (3) is attached below the third slot (7),
and the first, second and third slots (7) engaged by the bracket (3) are consecutive slots (7).

2. A bracket (3) as claimed in claim 1 wherein, when the bracket (3) is attached to an upright (1), the third vertical engagement means (35) engages the outside surface of the upright (1) substantially immediately below the third slot (7).

3. A bracket (3) as claimed in claim 1 or claim 2, wherein the mounting edge (15) comprises a fourth vertical engagement means (37) positioned between the second vertical engagement means (39) and the first horizontal engagement means (29) so that, when the bracket (3) is attached to an upright (1), the fourth vertical engagement means (37) engages the outside surface of the face (5) of the upright (1) to which the bracket (31) is attached.

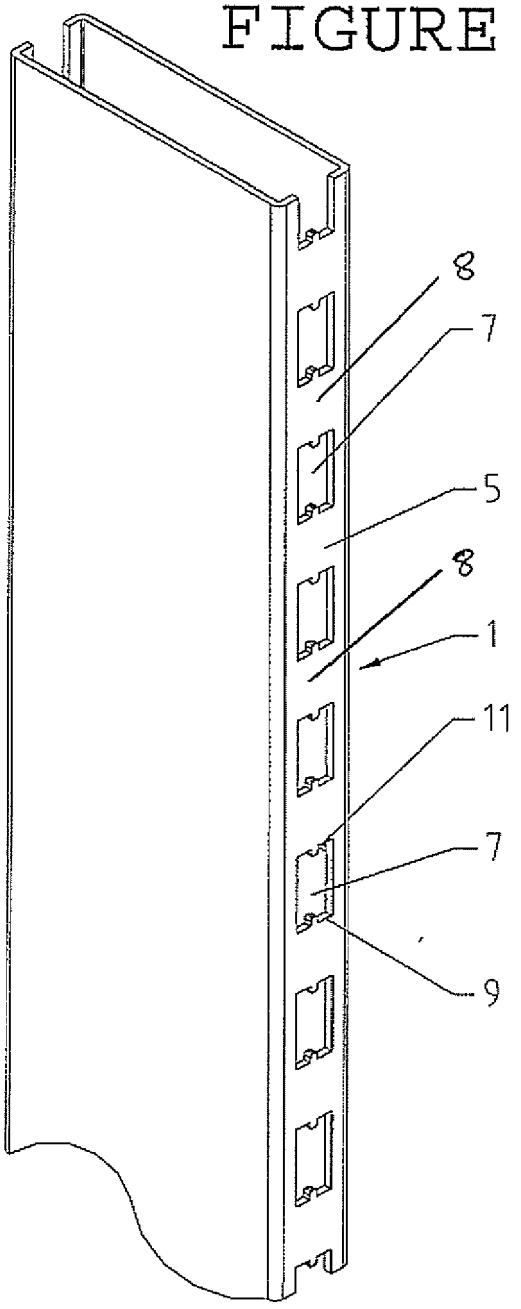
4. A bracket (3) as claimed in any preceding claim, wherein the mounting edge (15) comprises a second horizontal engagement means (41) positioned between the second vertical engagement means (39) and the first horizontal engagement means (29) so that, when the bracket (3) is attached to an upright (1), the second horizontal engagement means (41) supportingly engages the lower edge (9) of the second slot (7) in the upright (1) in which the second vertical engagement means (39) is located.

5. A bracket (3) as claimed in any preceding claim further comprising shelf engaging means (43).

6. A shelf comprising two or more brackets (3) as claimed in any preceding claim.

7. A modular shelving system comprising a plurality of uprights (1) having a plurality of regularly spaced apart slots (7), and further comprising a plurality of brackets (3) as claimed in any of claims 1 to 5 and/or a plurality of shelves as claimed in claim 6.

FIGURE 1



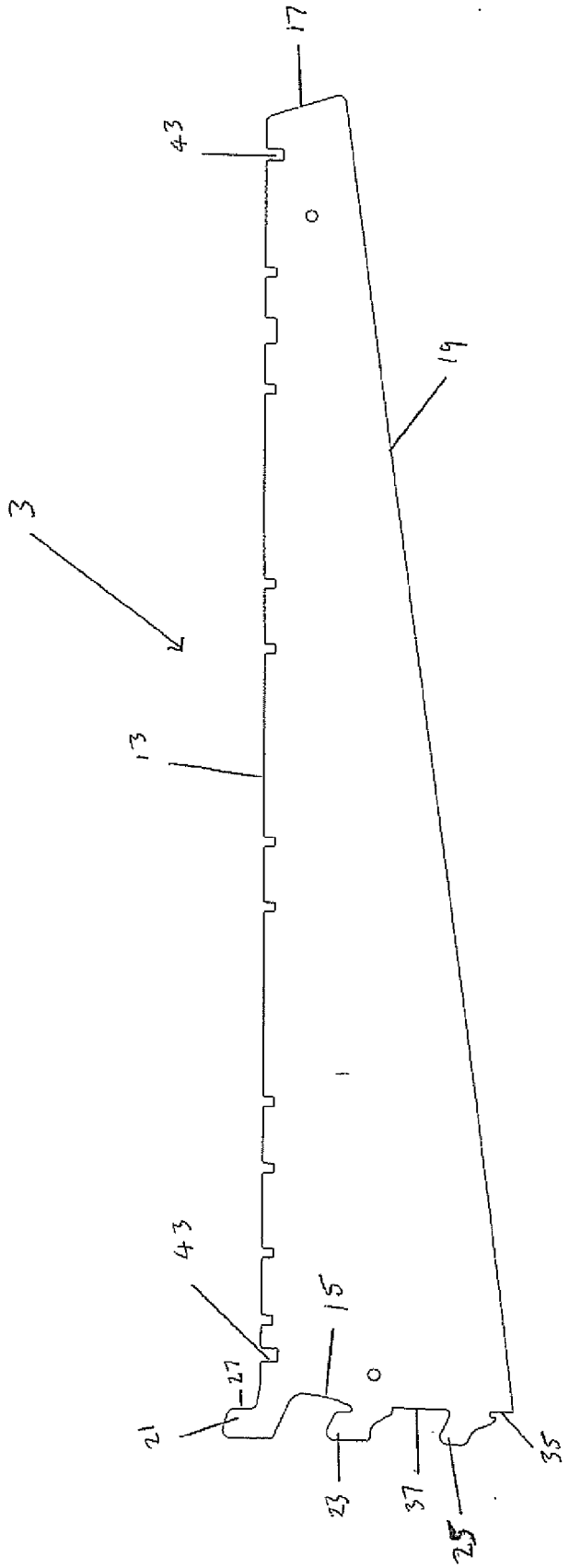


Figure 2

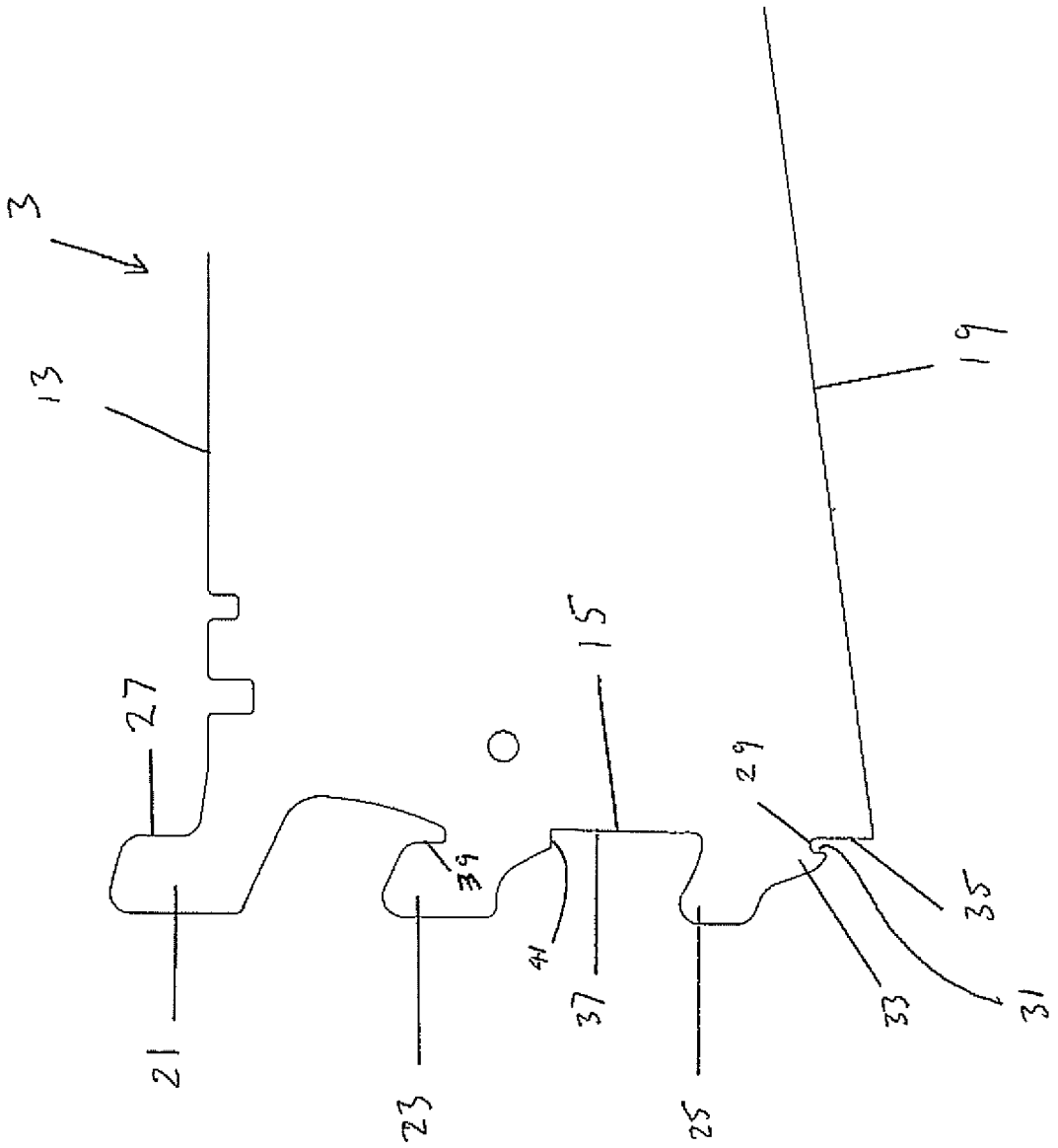


Figure 3

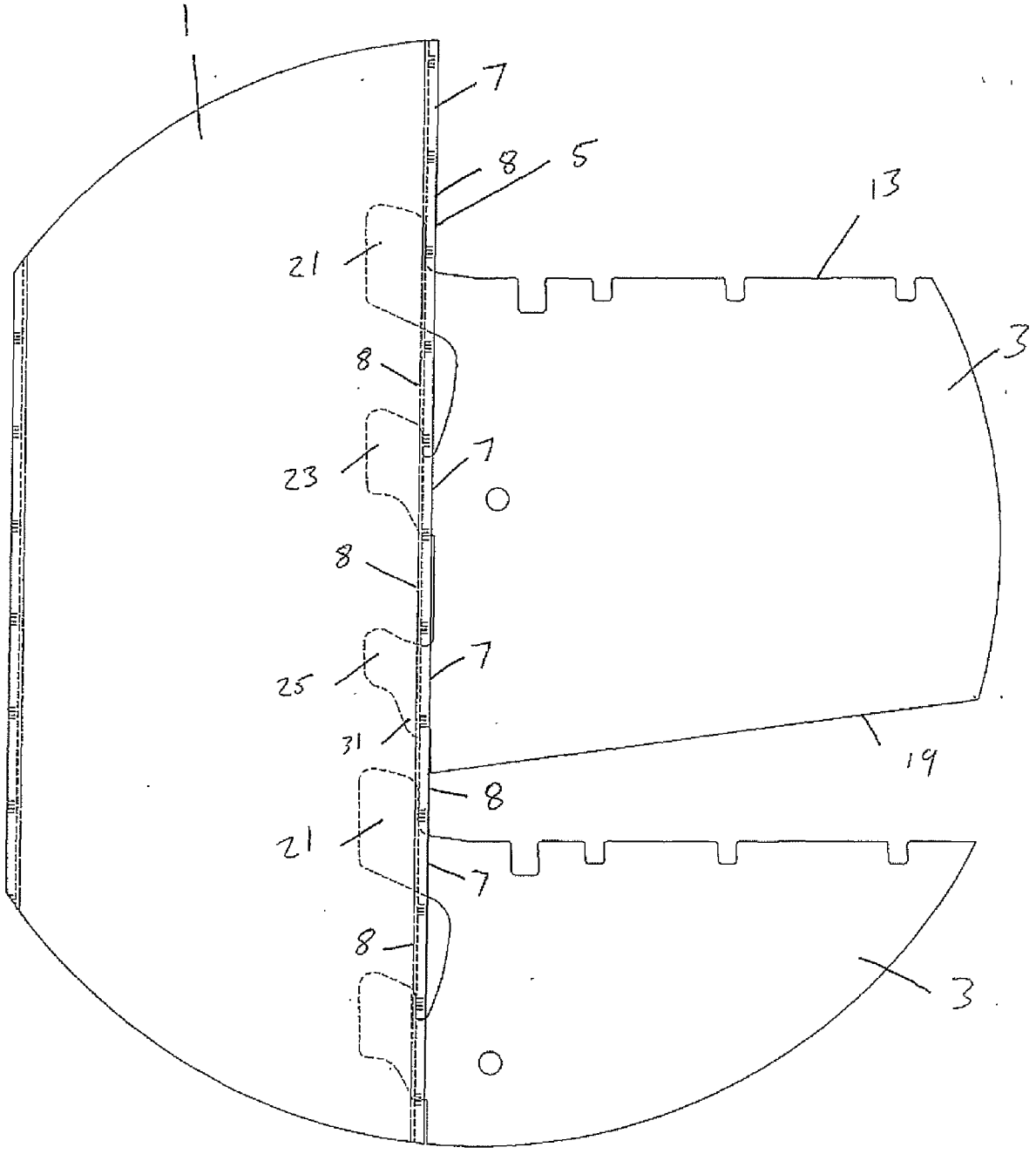


Figure 4

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EUROPEAN SEARCH REPORT

Application Number
EP 09 27 5053

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	US 2 956 766 A (GALASSI FRANCIS J) 18 October 1960 (1960-10-18) * the whole document *	1-7	INV. A47B57/42 A47B96/06
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TECHNICAL FIELDS SEARCHED (IPC)

A47B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	6 October 2009	Cardan, Cosmin

CATEGORY OF CITED DOCUMENTS

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06-10-2009

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