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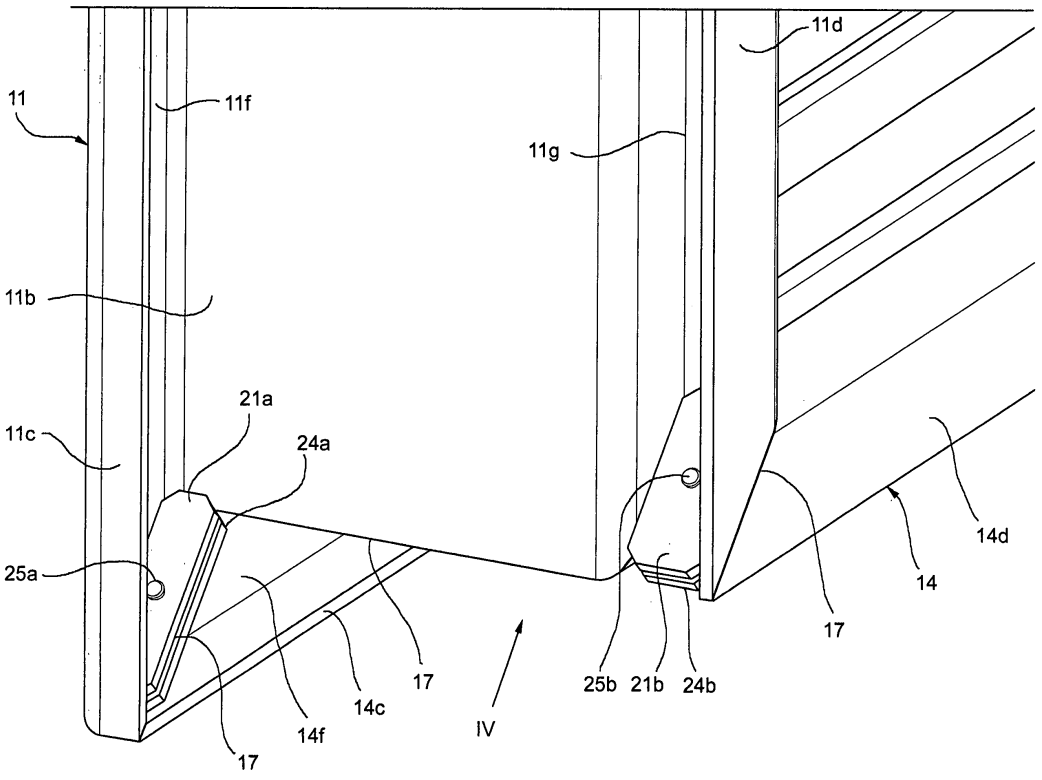
(54) **Method of fabricating a door or window frame for a boat and door or window for a boat**

(57) A method of fabricating a door or window frame (10; 110; 210) for a boat comprises the steps of providing a plurality of steel sections designed to form respective frame members (11, 12, 13, 14; 111, 112, 113, 114), and connecting these sections together by means of screws (25a, 25b; 120) at join zones (21a, 24a, 21b, 24b; 111f, 112f, 113f, 114f) between these sections. A description is also given of a door or window for a boat comprising at least one frame (10; 110; 210) made up of a plurality of frame members (11, 12, 13, 14; 111, 112, 113, 114). These frame members consist of steel sections. These frame members are also connected together by means of screws (25a, 25b; 120) at join zones (21a, 24a, 21b, 24b; 111f, 112f, 113f, 114f) between adjacent frame members.

FIG.3



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Description

[0001] The present invention relates to doors or windows intended to be installed in openings prepared in the walls of the rooms of a boat.

[0002] As is known, such doors or windows, particularly glazed doors, have frames made of steel sections. The members of these frames are generally joined together by welding. Following welding there is usually a polishing operation which is not automated. This polishing operation includes removing the weld beads from the visible surfaces of the frames, to give the door or window an aesthetically more pleasing appearance. This operation not only adds to the amount of time required to produce a door or window but also presents significant risks to the health of the people doing the polishing.

[0003] These problems are solved according to the invention by a method of fabricating a door or window frame for a boat according to Claim 1.

[0004] In this method the members which go to make up the frame are joined together by means of screws. By eliminating the welds it is possible to use prepolished sheet for the frame members. Since the polishing of individual sections can be automated, production times can be shortened.

[0005] The invention also relates to a door or window for a boat having the features defined in Claim 2.

[0006] Preferred embodiments are described in the dependent claims.

[0007] These and other objects and advantages will be made clearer in the course of the following detailed description of a preferred but not restrictive embodiment of the invention, with reference to the accompanying drawings, in which:

- Figure 1 is a front perspective view of a door or window fabricated by a method according to the present invention;
- Figure 2 is a front perspective view of a principal frame of the door or window seen in Figure 1;
- Figure 3 is a perspective view of a detail of the frame seen in Fig. 2, marked by arrow III in such figure;
- Figure 4 is a further perspective view of the detail seen in Figure 3, from the point of view indicated by arrow IV in such figure;
- Figure 5 is a front perspective view of a frame of one wing of the door or window seen in Figure 1; and
- Figures 6a, 6b, 6c and 6d are sectioned views of details of the frame seen in Figure 5, taken along the lines VIa, VIb, VIc and VId, respectively.

[0008] Referring to Figure 1, these show an example of a door or window having the general reference number 1, which is produced in the form of a glazed door having two sliding wings and a fixed wing and is suitable for installing in a wall of a room on board a boat. In the following description, the terms "front" and "rear", "right" and "left" are defined with reference to Fig. 1, by indicating as "front" face of the door that one which is visible in such figure.

[0009] The door or window 1 comprises a principal frame 10 suitable for installation in the abovementioned wall (not shown) in such a way as to surround an opening formed in this wall. The principal frame 10, also shown in Figure 2, comprises two vertical members or uprights 11, 12 and two horizontal members or traverses 13, 14, which connect together opposite ends of these uprights 11, 12.

[0010] The uprights 11 and 12 and the traverses 13 and 14 are made up of sections of steel and are of predetermined cross section shape. In particular, the sections used for the uprights 11, 12 and for the traverses 13, 14 each have a respective flange 11a, 12a, 13a and 14a projecting from the rest of the body of the section in such a way as to define with the latter a respective rear angular surface 11b, 12b, 13b and 14b. In the assembled condition of the door or window 1, the flanges 11a, 12a, 13a and 14a are located around the outer perimeter of the principal frame 10. The angular surfaces 11b, 12b, 13b and 14b which these define are intended to be coupled to the edges of the opening in which the door or window 1 is installed.

[0011] Each of the uprights 11 and 12 and traverses 13 and 14 has backwardly bent portions on both the front side and the rear side of the respective angular surface 11b, 12b, 13b and 14b. In the figures, in particular in Figs. 3 and 4 only the front and rear bent portions of the right upright 11 and lower traverse 14 are visible, and are numbered with 11c, 11d and 14c, 14d. The backwardly bent portions are shaped in such a way as to define respective grooves which, in the assembled condition of the door or window are intended to face and to be closed by corresponding surfaces of the wall located around the opening in which the door or window is installed. In the figures, in particular in Figs. 3 and 4 only the front and rear grooves of the right upright 11 and lower traverse 14 are visible, and are numbered with 11f, 11g and 14f, 14g.

[0012] Each of the sections of the uprights 11, 12 and traverses 13, 14 is cut at opposite ends 11e, 12e, 13e and 14e at an angle of 45° with respect to the longitudinal direction of the section. The ends 11e, 12e of each upright 11, 12 are then coupled to the ends 13e, 14e of the traverses 13, 14 to define 45° join planes 17, in such a way as to form corner parts of the principal frame 10.

[0013] One of these corner parts is illustrated in more detail in Figures 3 and 4, in two rear views from different points of view. In particular, in such figures one of the 45° join planes 17 is visible, to which a front connecting assembly 20a and a rear connecting assembly 20b are associated which are arranged so as to intersect this join plane 17.

[0014] Each connecting assembly 20a, 20b comprises a first coupling element 21a, 21b which is fixed to the upright 11 or formed integrally with it and is arranged in such a way as to be housed within one of the grooves 11f and 11g of the upright 11, and a second coupling

element 24a, 24b which is fixed to the traverse 14 or formed integrally with it and is arranged in such a way as to be housed within one of the grooves 14f and 14g of the traverse 14. Each connecting assembly 20a, 20b further comprises a screw 25a, 25b, which is screwed in corresponding aligned threaded bores of the respective first and second coupling element 21a, 21b, 24a, 24b in such a way as to connect and fix the upright 11 to the traverse 14 through the join plane 17. In the two views of Figures 3 and 4 the tips and heads of the connecting screws 25a, 25b are visible. The coupling elements 21a, 21b; 24a, 24b of the upright 11 and traverse 14, respectively, therefore define join zones between the members of the principal frame.

[0015] The door or window 1 also includes at least one moveable wing 101. In the illustrated example there are two moveable wings of the sort that slides relative to the principal frame 10. To the ends of the present invention the moveable wings have a quite identical structure, therefore in the following reference will be made for simplicity only to one of them, particularly to the wing to be fitted with an handle M. With reference particularly to Figure 5, the moveable wing 101 comprises a secondary frame 110 designed to be slidably fitted into the principal frame 10. The secondary frame 110 similarly comprises a pair of vertical members or uprights 111, 112 and a pair of horizontal members or traverses 113, 114 connecting together the opposite ends of these uprights 111, 112.

[0016] The uprights 111 and 112 and the traverses 113 and 114 are formed from sections of steel and are of predetermined cross section shape. In particular, the uprights 111, 112 and the traverses 113, 114 have box-like shape. Furthermore, both the uprights 111, 112 and the traverses are closed at their ends.

[0017] As can be seen in Fig. 5, the ends 111e, 112e of each upright 111, 112 are coupled to the ends 113e, 114e of the traverses 113, 114 and define respective join planes 117 in such a way as to form corner parts of the secondary frame 110.

[0018] These corner parts are shown in more detail and in cross section in Figures 6a, 6b, 6c, 6d. In particular, in Figures 6a and 6b join planes 117 are visible which are arranged vertically, and in Figures 6c and 6d join planes 117 are visible which are arranged horizontally. Each of these join planes 117 is intersected by at least one connecting screw 120.

[0019] The connecting screws 120 are intended to connect and fix uprights and traverses to each other. To this end, each upright 111, 112 and traverse 113, 114 has at its ends a coupling wall portion 111f, 112f, 113f, 114f provided with threaded bores and intended to be coupled to a corresponding coupling wall portion 111f, 112f, 113f, 114f on the other side of the respective join plane 117, which is provided with threaded bores to be aligned with the other bores in such a way as to permit screwing in of the screws 120. The coupling wall portions 111f, 112; 113f, 114f of the uprights 111, 112 and of the traverses 113, 114, respectively, therefore define join zones between the members of the secondary frame, which are arranged in such a way as that the protruding parts of the connecting screws 120 protrude at the most into the hollows of the box-like sections. In this way, in the assembled condition of the door or window 1 these screws 120 are not visible from the outside. In order to allow access to the screws 120 so as to permit screwing, the peripheral walls of the uprights 111, 112 are provided with holes 150 for allowing introduction of a suitable tool, whereas the lower traverse 114 is open at the bottom. In the assembled condition of the door or window 1 these holes 150 and openings are hidden and therefore not visible.

[0020] The inner perimeter of the secondary frame 110 of the wing 101 is designed for the attachment, for example by adhesive bonding, of a sheet 140 of transparent or translucent material such as glass.

[0021] The door or window 1 also includes a fixed wing 201. The fixed wing 201 comprises a secondary frame 210 designed to be mounted in a stationary manner in the principal frame 10. The structure of the secondary frame 210 of the fixed panel 201 is much the same as that of the secondary frame 110 of the moveable wing 101, and will not therefore be further described. The inner perimeter of the secondary frame 210 of the fixed wing 201 is designed for the attachment, for example by adhesive bonding, of a sheet 240 of transparent or translucent material such as glass.

[0022] As described above, the structural members that form the principal frame and the secondary frames are joined together by means of screws. Eliminating the welds avoids the need to grind off the visible weld beads as was done in the prior art. This makes production times shorter.

[0023] Clearly, the present invention is not limited to the type of door or window illustrated, but rather is applicable to any type of door or window comprising at least one frame made of a plurality of frame members made of steel sections.

Claims

1. Method of fabricating a door or window frame (10; 110; 210) for a boat, which method is **characterized in that** it comprises the following steps:

   - providing a plurality of steel sections designed to form respective frame members (11, 12, 13, 14; 111, 112, 113, 114f); and
   - connecting the said sections together by means of screws (25a, 25b; 120) at join zones (21a, 24a, 21b, 24b; 111f, 112f, 113f, 114f) between the said sections.

2. Door or window for a boat comprising at least one frame (10; 110; 210) made up of a plurality of frame members (11, 12, 13, 14; 111, 112, 113, 114), the

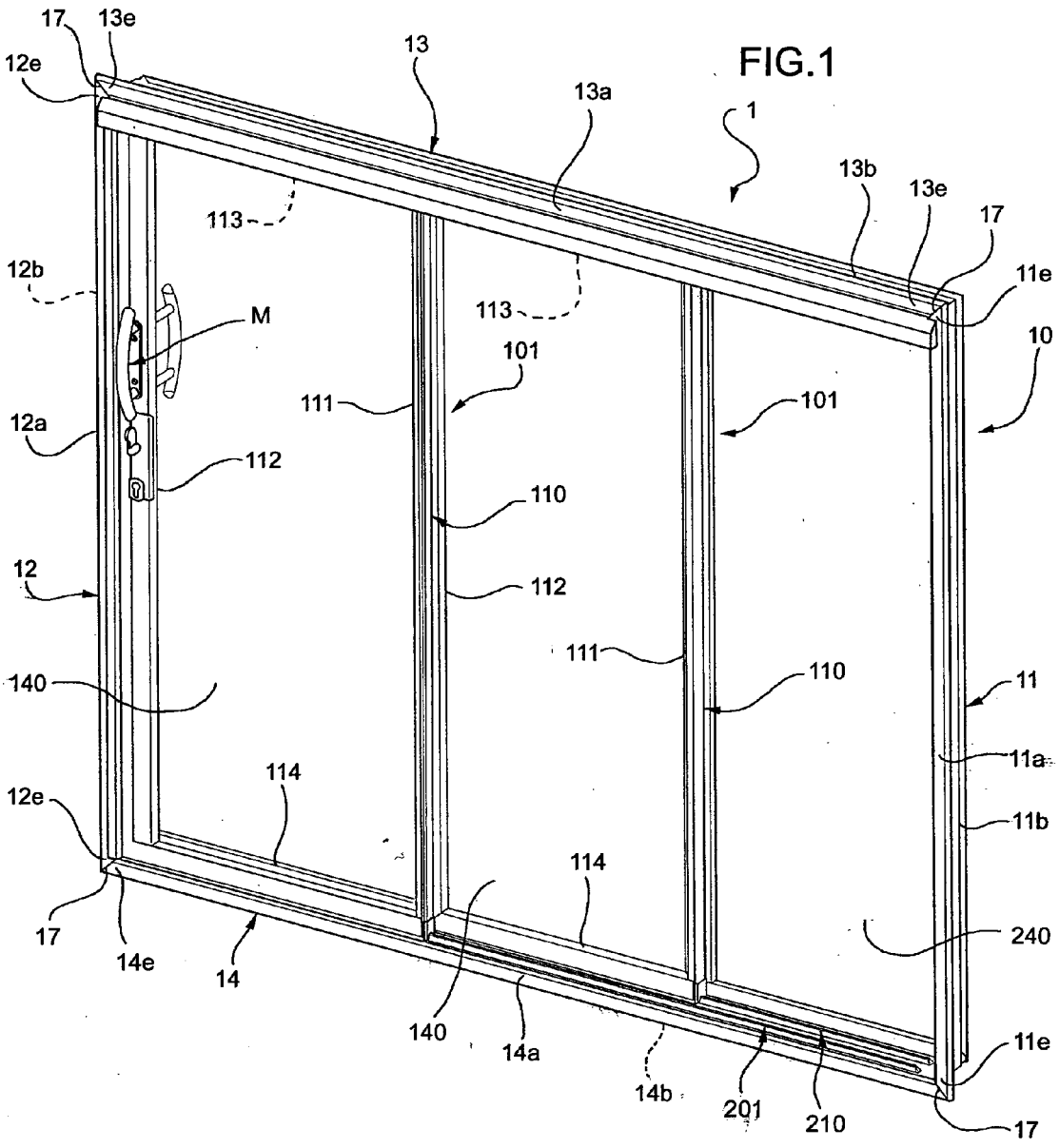
said frame members consisting of steel sections, which door or window is **characterized in that** the said frame.members are connected together by means of screws (25a, 25b; 120) at join zones (21a, 24a, 21b, 24b; 111f, 112f, 113f, 114f) between adjacent frame members.

3. Door or window according to Claim 2, in which the said join zones are disposed in such a way that in an installed condition of the door or window the said screws are normally unvisible.

4. Door or window according to Claim 3, in which at least some of the said sections (111, 112, 113, 114) have box-like shape.

5. Door or window according to Claim 3 or 4, in which at least some of the said join zones (21a, 24a, 21b, 24b) are disposed within grooves (11f, 14f, 11g, 14g) formed on the said sections.

FIG.1


17
13e
12e
13
13a
1
13b
13e
17
11e
10
113
113
12b
M
101
111
101
12a
112
110
12
112
111
110
140
11
11a
114
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11b
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17
14e
14
240
140
14a
14b
201
210
11e
17

FIG.2

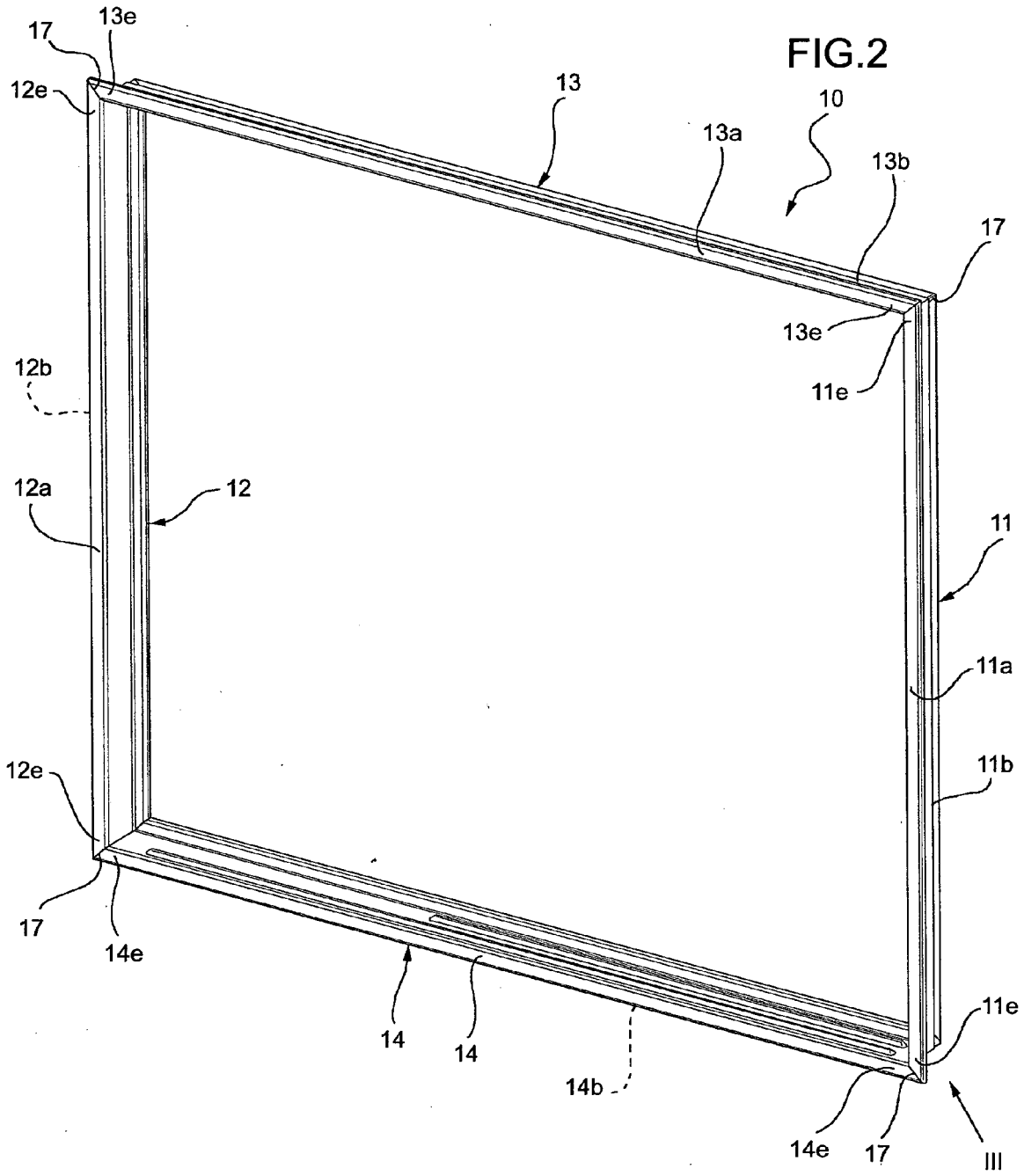

17
13e
12e
13
10
13a
13b
17
13e
11e
12b
12a
12
11
11a
12e
11b
17
14e
14
14
14b
11e
14e
17
III

FIG.3

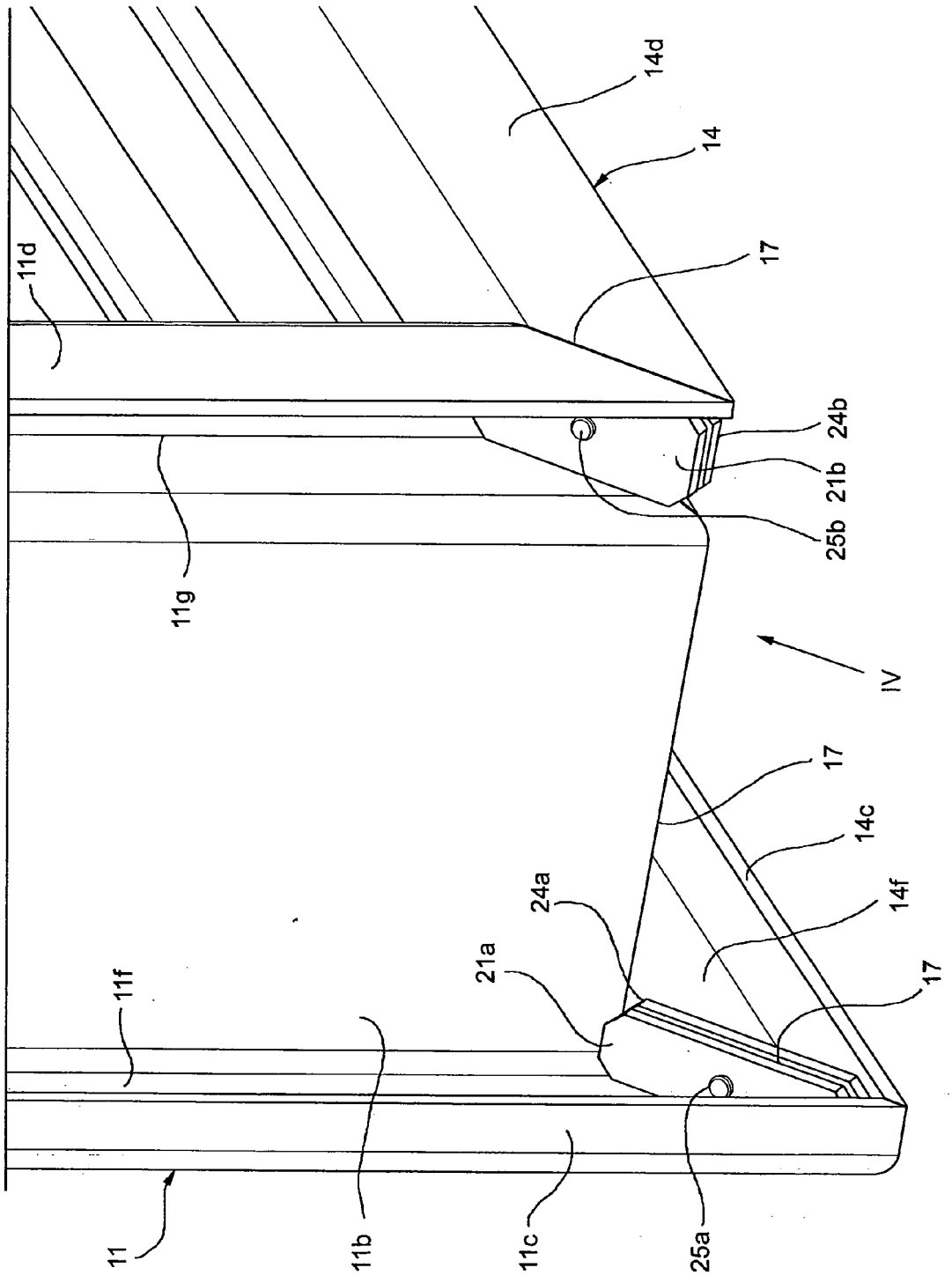

14d
14
17
11d
24b
21b
25b
11g
IV
17
14c
24a
14f
21a
17
11f
11
11b
11c
25a

FIG.4

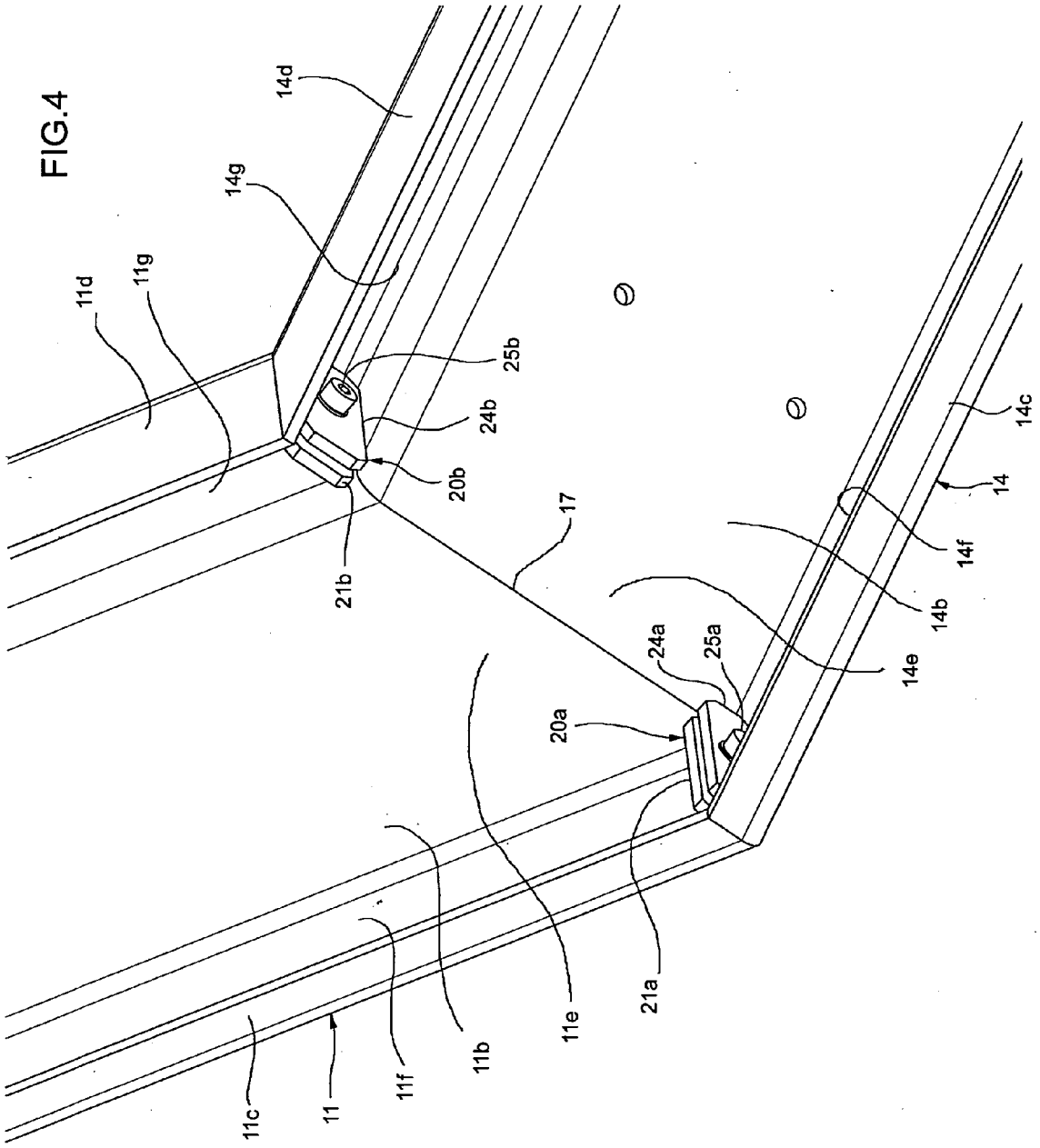

14d
14g
11d
11g
25b
24b
20b
21b
17
14c
14
14f
14b
14e
24a
25a
20a
21a
11e
11b
11f
11
11c

FIG.5

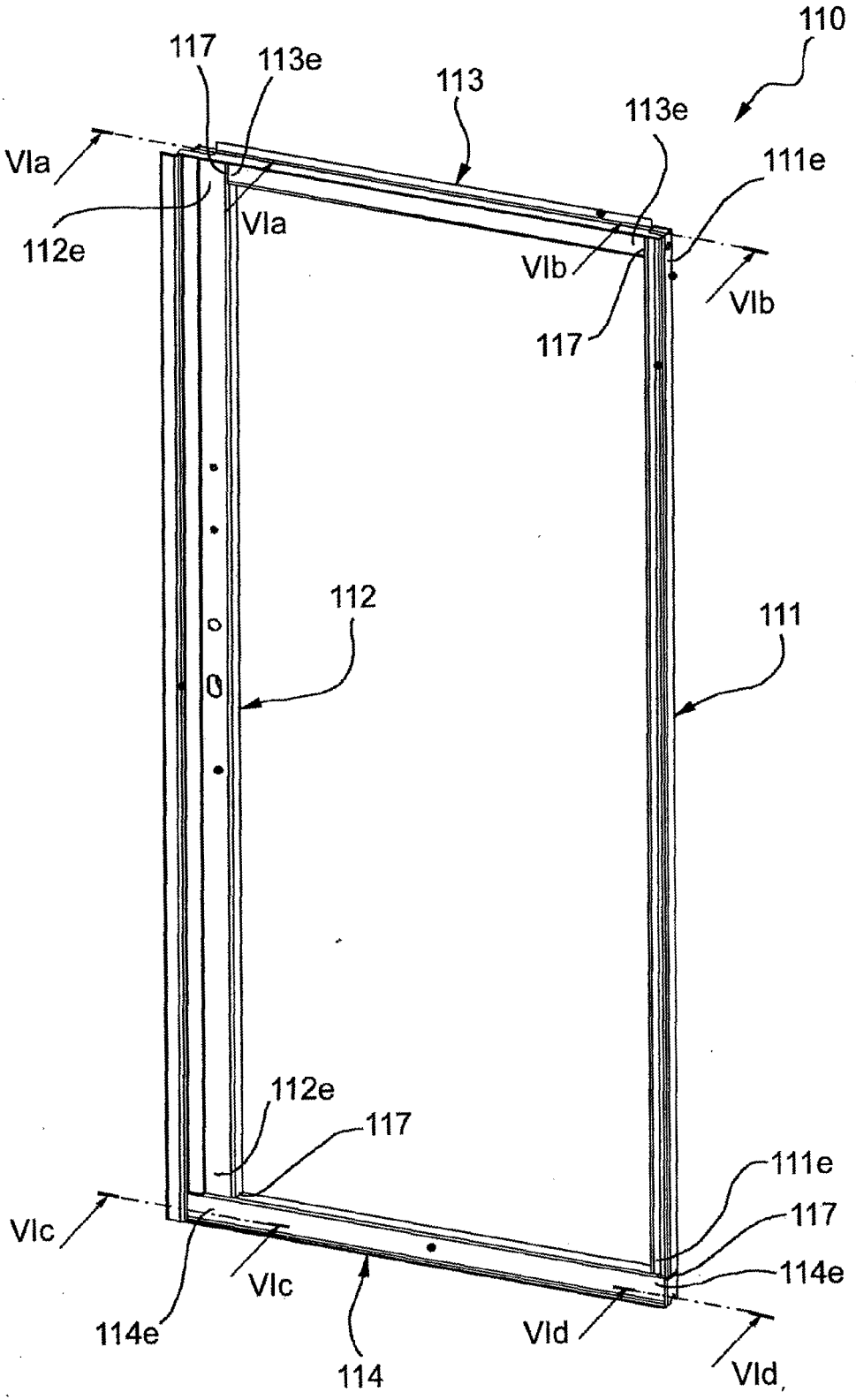

110
117
113e
113
113e
111e
VIa
112e
VIa
VIb
VIb
117
112
111
112e
117
111e
117
VIc
114e
VIc
114e
114
VId
VId

FIG.6a

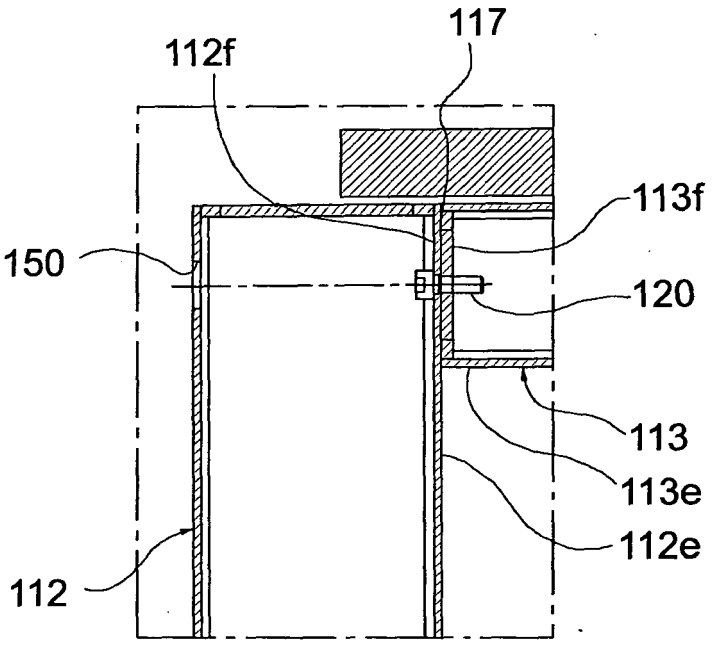

117
112f
113f
150
120
113
113e
112e
112

FIG.6b

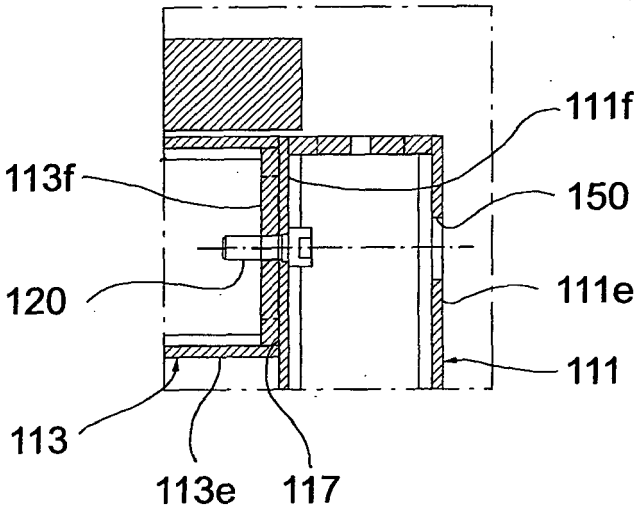

111f
113f
150
120
111e
111
113
113e
117

FIG.6c

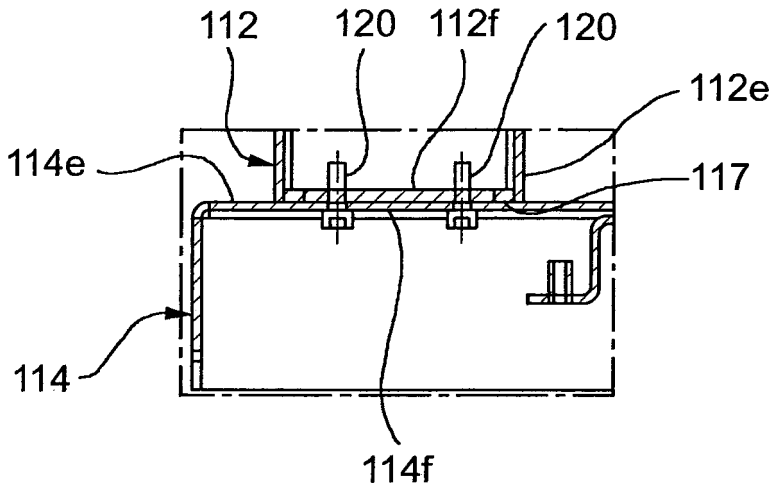
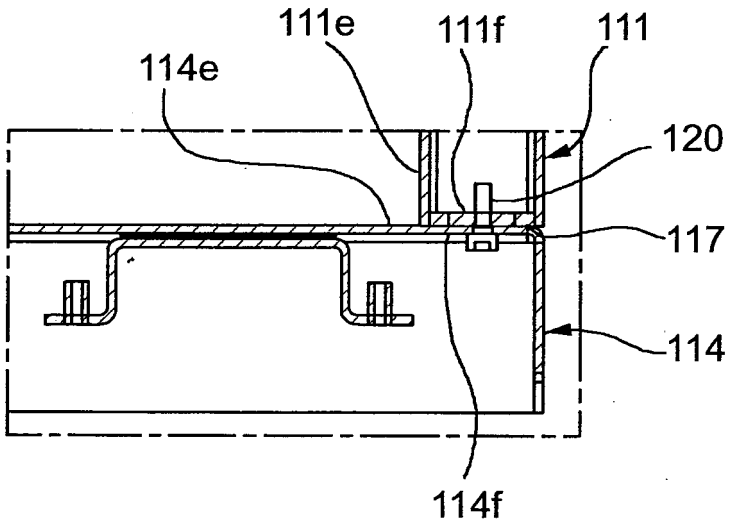

112
120
112f
120
112e
114e
117
114
114f

FIG.6d


111e
111f
111
114e
120
117
114
114f

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EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5074

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X	DE 16 83 304 A1 (GROKE KG) 19 May 1971 (1971-05-19) * the whole document *	1-5	
X	US 2 611 633 A (WEBSTER CLIFFORD L) 23 September 1952 (1952-09-23) * column 2, line 1 - column 4, line 24; figures 1-5 *	1-5	TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	28 June 2006	Kofoed, P

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28-06-2006

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