(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

PCT

(43) International Publication Date
31 August 2006 (31.08.2006)

(10) International Publication Number
WO 2006/089647 A1

(51) International Patent Classification:
A47B 57/26 (2006.01) *F16B 12/32* (2006.01)

(21) International Application Number:
PCT/EP2006/001186

(22) International Filing Date:
10 February 2006 (10.02.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
MI2005A000269 22 February 2005 (22.02.2005) IT

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:
— *of inventorship (Rule 4.17(iv))*

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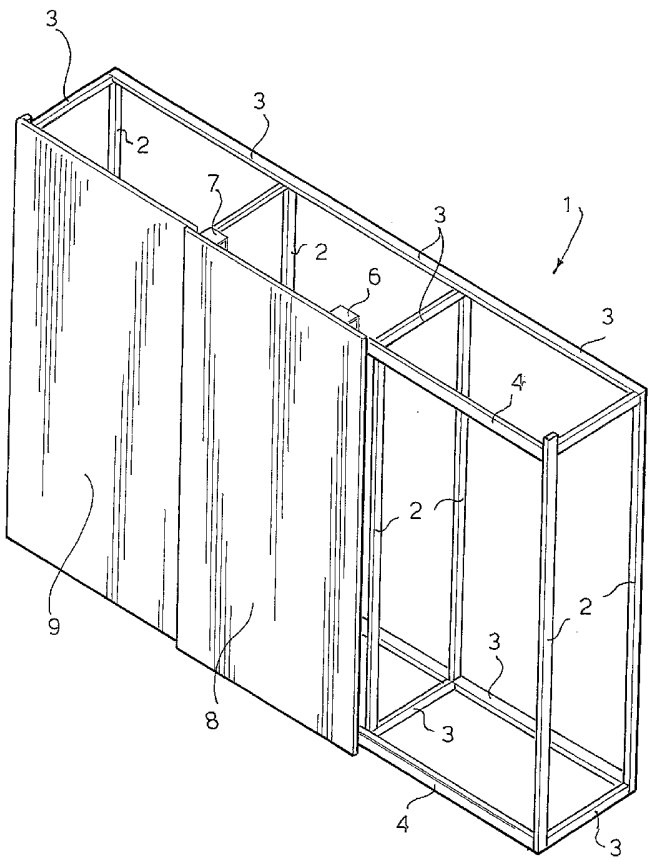
(54) Title: CONSTRUCTIVE STRUCTURE FOR FURNITURE



(57) Abstract: The constructive structure for furniture (1), in particular for furniture with large dimensions, comprises a frame consisting of uprights (2) and of cross members (3, 4) constructed with portions of metal section bars (20, 30) and connected to each other by junction means (5), each of which is able to connect an upright (2) to an end of a cross member (3, 4). If the furniture item has sliding wings, the section bar (30) used to construct the cross members (4) positioned on the front part of the furniture item has a curved upper area (31) - whereon carriages (6, 7) which support the wings (8, 9) slide - and at least one compartment (32), open inferiorly, in which means (10, 11) able to guide the wings (8, 9) supported by the carriages (6, 7) slide. Advantageously, in said compartment (32) are also located means (12, 13) able to limit the travel of the wings (8, 9).

WO 2006/089647 A1

Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

CONSTRUCTIVE STRUCTURE FOR FURNITURE

DESCRIPTION

The present invention relates to a constructive structure for furniture – in particular for furniture items of large dimensions, such as cabinets – which comprises a metal frame (consisting of uprights and cross members connected to each other by joints) closed by doors and/or by wings of various types (sliding, swivelling, etcetera).

Constructive structures for furniture are known, comprising a metal frame closed by doors and/or by wings, which are normally produced in prefixed dimensions and marketed in assembly "kits" comprising – in addition to the doors and/or wings and to the assembly and finishing accessories (handles; hinges, if any; carriages for sliding wings; etcetera) – the uprights and the cross members already cut and, often, provided at least at one end with means able to couple them to each other.

Known constructive structures, having prefixed dimensions, are not able to meet specific user needs (consider, purely by way of example, the fact that home ceilings do not always have the same distance from the floor and/or that the dimensions of a space in which a wall cabinet is to be placed are different on a case by case basis) and therefore they require (or may require) long and costly adaptation work to be performed in place.

Object of the present invention is obtain a constructive structure able to overcome the limitations of known structures; this object is achieved by means of a constructive structure that has the characterising elements illustrated in claim 1.

Additional advantageous characteristics of the invention are described in the dependent claims.

The invention shall now be described with reference to an embodiment provided purely by way of non limiting example shown in the appended figures, where:
- Figure 1 schematically shows a perspective view of a furniture item with sliding wings realised according to the invention;
- Figure 2 schematically shows a front view, a top view and a perspective view of a portion of a first section bar;

- Figure 3 schematically shows a front view, a top view, a lateral view and a perspective view of a portion of a second section bar;
- Figure 4 schematically shows an exploded front view, an exploded top view, an exploded lateral view and an exploded perspective view of a joint able to couple two section bar portions to each other;
- Figures 5 and 6 schematically show a front view, a top view, a lateral view and a perspective view of a carriage able to bear an outer wing, respectively an inner wing in a structure according to the invention;
- Figures 7 and 8 schematically show a front view, a lateral view and two perspective views of the means able to guide an outer wing, respectively an inner wing;
- Figures 9 and 10 schematically show a front view, a top view, a lateral view and a perspective view of means able to limit the travel of a wing, as well as the aforesaid means inserted in a portion of the second section bar of Figure 3.

In the appended figures, the corresponding elements shall be identified by the same numeric references.

Figure 1 schematically shows a perspective view of the constructive structure 1, according to the invention, of a furniture item with sliding wings.

The constructive structure 1 comprises a frame constituted by uprights 2 and by cross members (3, 4) connected to each other (at right angle) by joints 5, each of which is able to connect an upright 2 to an end of a cross member (3, 4).

Figure 1 also shows the sliding wings 8 and 9, which are borne by carriages (6, respectively 7; Figures 5 and 6) slidable on the cross members 4 positioned on the front part of the furniture item and guided by guiding means (10, respectively 11; Figures 7 and 8) positioned in the lower part of the wings (8, 9) and slidable on additional cross members 4, not visible in Figure 1 because they are covered by the wings themselves.

Advantageously, the uprights 2 and the cross members 3 are constituted by portions of the metal section bar 20 shown in Figure 2 whilst the cross members 4 are constituted by portions of the metal section bar 30 shown in Figure 3.

The joints (only one whereof is designated in Figure 1 with the numeric reference 5 for graphic representation simplicity) shall be better described with reference to Figure 4.

If the furniture item does not comprise the sliding wings 8 and 9, the cross members 4 positioned on the front part of the furniture item can also be constituted by portions of the metal section bar 20 shown in Figure 2.

Figure 2 schematically shows a front view (Figure 2a), a top view (Figure 2b), and a perspective view (Figure 2c) of a portion of a first section bar 20 to be used to construct the uprights 2 and the cross members 3, including the cross members positioned on the front part of the structure 1 if the wings 8 and 9 are not present.

The first section bar 20 has a substantially rectangular section with two mutually orthogonal axes of symmetry and it has a central longitudinal compartment 21 whose shape is complementary to that of the body 40 of the joint 5 (Figure 4) and a plurality of lateral longitudinal compartments (only one whereof is designated with the numeric reference 22 in each of the three views of Figure 2) able to house blocking means 44 belonging to the joint 5, which shall be described with reference to Figure 4.

In the embodiment shown in Figure 2, the first section bar 20 has two lateral compartments 22 on each of its longer sides and one lateral compartment 22 on each of its shorter sides.

Figures 2a and 2c also show a through hole 23, drilled at least at one end of a portion of the first section bar 20, in which are engaged fastening means 45, belonging to the joint 5 and able to fasten the joint 5 to the portion of the first section bar 20, which shall be described with reference to Figure 4.

Figure 3 schematically shows a front view, a top view, a bottom view and a perspective view of a portion of a second section bar 30, used to construct the uprights 4 positioned on the front part of the structure 1 if the furniture item comprises the sliding wings 8 and 9.

The second section bar 30 has a curved upper area 31 whereon carriages (6, 7) supporting the slidable wings (8, 9) slide; a first longitudinal inner compartment 33, corresponding to the central compartment 21 of the first section bar 20, having a shape complementary to that of the body 40 of a joint 5; a second longitudinal inner compartment 32, open inferiorly, in which means (10, 11; Figures 7, 8) able to guide the wings (8, 9) supported by the carriages (6, 7) slide and in which means (12, 13; Figures 9, 10) able to limit the travel of the wings (8, 9) are also located; a plurality of lateral longitudinal compartments

34, corresponding to the lateral compartments 22 of the first section bar 20, able to house the blocking means 44 belonging to the joint 5.

In the embodiment shown in Figure 3, the second section bar 30 has two lateral compartments 34 on each of its longer sides.

Advantageously, the second section bar 30 also has lateral longitudinal compartments (only one whereof is designated with the numeric reference 35 in each of the three views of Figure 3) able to house means for levelling and stiffening the structure 1 (constituted, for example, by a bottom wall, by a lateral wall or by a metal "pad" that bears an adjustable foot to level the structure 1) not described herein because they are known in themselves.

At least at one end of a portion of the second section bar 30 is also present a through hole (corresponding to the through hole 23 of Figure 2 and omitted in Figure 3 for graphic representation simplicity) in which are engaged fastening means 45 belonging to a joint 5 to fasten the joint 5 to the portion of the second section bar 30.

Figure 4 schematically shows an exploded front view (Figure 4a), an exploded top view (Figure 4b), an exploded lateral view (Figure 4c) and an exploded perspective view (Figure 4d) of a joint 5 able to couple to a cross member 3 or 4 an upright 2 and/or another cross member 3 or 4.

The joint 5 comprises a body 40, terminating with a widened area 41, in which are drilled two through holes (not visible in Figure 4) into which through screws 43 engaging blocking means 44 are inserted and a compartment 46 in which the fastening means 45, able to be engaged in the through hole 23 present at least at one end of a portion of section bar (20, 30) to fasten the joint 5 to the portion of section bar (20, 30), are located.

Advantageously, the blocking means 44 are constituted by a tapped insert whose width does not exceed the entry width L of the lateral longitudinal compartments 22 and 34 of the section bars 20 and 30, i.e. the width of the lateral longitudinal compartments 22 and 34 at the surface of the section bars 20 and 30.

In the embodiment shown in Figure 4, the fastening means 45 are constituted by a telescopic screw which comprises a first element 45' whose outer shape is complementary

to that of the compartment 46 and having a threaded axial hole and a second element 45" having a threaded stem to be screwed into the threaded hole of the first element 45'; the first and the second element (45', 45") have a head whose shape is complementary to that of the through hole 23, present at one end of a portion of section bar (20, 30), in which they are engaged to fasten the joint 5 to the portion of section bar (20, 30) when the elements (45', 45") of the junction means 45 are unscrewed with respect to each other.

The widened area 41 has a plurality of recesses (only one whereof has been designated with the numeric reference 47 in Figures 4b and 4d), distributed along its periphery, which provide it with a shape similar to that of the first section bar 20, as can easily be verified by comparing Figures 2b and 4b to each other.

The recesses 47 are able to receive, in the crossing points between an upright and a cross member, the panels for closing the furniture item, if present, thereby avoiding additional work to remove the corners of the panels at the aforesaid crossing points.

Moreover, the widened area 41 has, at the through holes, two (substantially) square guiding projections 42, whose side is no greater than the width of the lateral longitudinal compartments 22 and 34 of the section bars 20 and 30.

A possible procedure for coupling by means of a joint 5 a cross member (3, 4), constituted by a portion of a section bar (20, 30), to an upright 2 and/or to another cross member (3, 4) is the following:

- the blocking means 44 of a joint 5 are inserted in the lateral longitudinal compartments (22, 34) of the upright 2 or of the other cross member (3, 4) and they are locked in place with the through holes 43; and
- the body 40 of the joint 5 is inserted into the end of the cross member (3, 4) and it is locked in place by inserting the ends of the fastening means 45' and 45" into the through hole 23 present at one end of the cross member (3, 4).

Figure 5 schematically shows a front view, a top view, a lateral view and a perspective view of a carriage 6 able to bear an outer wing 8 of a structure 1 according to the invention.

The carriage 6 comprises an "L" shaped bracket 51 whose horizontal arm 53 has a central hole in which an adjusting bolt 57 slides, whereto a body 56 bearing a wheel 59 (Figure

5a) able to slide on the curve area 31 of the second section bar 30 is fastened; preferably, the arm 53 also bears two guiding pins 58 of the body 56, which are inserted in two holes present in the upper part of the body 56.

The vertical arm 52 of the bracket 51, to be fastened to the outer wing 8, has a plurality of holes 54 (Figure 5d) for the fastening screws and, preferably, two anchoring and fastening pins 55 to be inserted in corresponding holes drilled in the outer wing 8.

In the embodiment shown in Figure 5, the body 56 is constituted by a "U" bent metal sheet element, whereto is welded the adjustment bolt 57 (fastened in position by means of nut and lock nut or by means of another functionally equivalent reversible fastening means), which bears the axis of rotation of the wheel 59, preferably mounted on a ball bearing.

Figure 6 schematically shows a carriage 7 able to bear an inner wing 9 of a structure 1 according to the invention, which differs from the carriage 6 shown in Figure 5 essentially in that the horizontal arm 63 that bears the wheel 69 is shorter than the arm 53 which, in the carriage 6 shown in Figure 5, bears the wheel 59.

In Figure 6d the holes 64 are hidden by the body 66.

The other elements of the carriage 7 shall not be described herein because they are substantially identical to the corresponding elements of the carriage 6 of Figure 5.

Figure 7 schematically shows a lateral view (Figure 7a), a front view (Figure 7b) and two perspective views (Figures 7c and 7d) of the means 10 able to guide an outer wing 8 borne by the carriage 6 of Figure 5.

The guiding means 10 comprise a bracket 71, shaped as an inverted "L", to be applied on the lower inner face of the outer wing 8, whose vertical arm 72 – to be fastened to the outer wing 8 – has a plurality of holes (only one whereof has been designated with the numeric reference 74) for the fastening screws and, preferably, two anchoring and fastening pins 75 to be inserted in corresponding holes drilled in the outer wing 8.

The horizontal arm 73 of the bracket 71 has a central hole in which slides an adjustment bolt 77 which bears a guiding wheel 78 (Figures 7c and 7d) able to slide in the second inner compartment 32, open inferiorly, of the second section bar 30; the arm 73 also has a

pair of threaded lateral holes 76, in one whereof is placed a pivot pin 79 able to be engaged with locking means (13; Figure 10) of the outer wing 8.

In the embodiment illustrated in Figure 7 the pivot pin 79 is situated to the left of the bolt 77 (Figure 7c) if the outer wing 8 opens rightwards, to the right of the bolt 77 (Figure 7d) if the outer wing 8 opens leftwards.

Moreover, the adjustment bolt 77 and the pivot pin 79 are fastened in position by means of nut and lock nut (or by another functionally equivalent reversible fastening means) and the guiding wheel 78 is preferably mounted on a ball bearing.

Figure 8 schematically shows the means 11 able to guide an inner wing 9 borne by the carriage 7 of Figure 6, which differ from the guiding means 10 shown in Figure 7 in that the bracket 81 is "L" shaped and it is applied on the upper inner face of the inner wing 9 and in that the horizontal arm 83 that bears the bolt 87 and the wheel 88 is shorter than the horizontal arm 73 that, in the guiding means 10 shown in Figure 7, bears the bolt 77 and the wheel 78.

Advantageously, the pivot pins 89 of the guiding means 11 are longer than the pivot pin 79 of the guiding means 10.

Moreover, the pivot pins 89 can be omitted (Figure 8c) or be positioned either both to the right and to the left of the bolt 87 (Figure 8d).

The other elements of the guiding means 11 shall not be described herein because they are substantially identical to the guiding means 10 of Figure 7.

Figure 9 schematically shows a front view, a top view, a lateral view and a perspective view of the means 12 able to limit the travel of an inner wing 9, as well as the aforesaid means 12 inserted in the second longitudinal inner compartment 32 (Figure 9e) of the portion of the second section bar 30 (Figure 3) which constitutes a cross member 4.

The means 12, preferably made of a plastic material, are located in the inner area (in the upper area in Figure 9e) of the compartment 32 and comprise a "U" shaped body 90 (whose width is smaller than the inner width of the area of the compartment 32 in which it is inserted) and a fastening area 91 (whose width does not exceed the inner width of the

area of the compartment 32 in which it is inserted) in which fastening means 92 constituted, for example, by a telescopic screw and anyway not described herein because they are known in themselves, are located.

Advantageously, the pivot pin 79 belonging to the guiding means 10 of an outer wing 8 has such length as to be engaged in the "U" shaped body 100 of the means 13 (Figure 10) but not to be engaged in the "U" shaped body 90 of the means 12 located in the inner area of the compartment 32, thereby enabling the outer wing 8 to be superposed to an inner wing 9, whilst the pivot pins 89 of the guiding means 11 of an inner wing 9, being longer than the pivot pin 79 of the guiding means 10 of an outer wing 8, are engaged in the "U" shaped bodies (90, 100) of the means 12 and 13.

The means 12 are advantageously used if the structure 1 comprises two or more inner wings 9 to prevent two adjacent inner wings 9 from hitting each other during the opening operation; for this purpose, a pair of means 12 is inserted – with the fastening areas 91 adjacent to each other – in the inner area of the compartment 32, made to slide to the intermediate stop points of the two inner wings 9 and fastened in place with the fastening means 92.

If the structure 1 comprises only one inner wing 9, without departing from the scope of the invention it is possible to use the means 12 to fasten an intermediate stop point of the inner wing 9.

Figure 10 schematically shows a front view, a top view, a lateral view and a perspective view of the means 13 able to limit the travel of an outer wing 8, as well as the aforesaid means 13 inserted in the longitudinal inner compartment 32 (Figure 10e) of the portion of the second section bar 30 which constitutes a cross member 4.

The means 13 differ from the means 12 of Figure 9 essentially in that they are positioned at each end of the cross members 4, they are located in the outer area (in the lower area in Figure 10e) of the compartment 32 of the second section bar 30 and they are fastened in place by means of a bolt 102 located in the fastening area 101 of the means 13 and of a nut 103 located in the inner area (in the upper area in Figure 10e) of the compartment 32.

The other elements of the means 13 shall not be described herein because they are substantially identical to the corresponding elements of the means 12 of Figure 9.

Without departing from the scope of the invention, a person skilled in the art can subject the constructive structure for furniture described above to all modifications and improvements suggested by normal experience and/or by the natural evolution of the art.

CLAIMS

1. A constructive structure for furniture (1), characterised in that it comprises a frame constituted by uprights (2) and cross members (3, 4) connected to each other, at right angle, by junction means (5), each of which is able to connect an end of a cross member (3, 4) to an upright (2).

2. The constructive structure (1) claimed in claim 1, characterised in that the uprights (2) and the cross members (3) are constituted by portions of a first metal section bar (20) and in that the cross members (4) are constituted by portions of a second metal section bar (30).

3. The constructive structure (1) claimed in claim 2, characterised in that the first section bar (20) has a rectangular section and in that it has a central longitudinal compartment (21) whose shape is complementary to that of a body (40) belonging to the junction means (5) and a plurality of lateral longitudinal compartments (22) able to house blocking means (44) belonging to the junction means (5).

4. The constructive structure (1) claimed in claim 3, characterised in that the first section bar (20) has two lateral longitudinal compartments (22) on each of its longer sides and one lateral longitudinal compartment (22) on each of its shorter sides.

5. The constructive structure (1) claimed in claim 2 in which the furniture item comprise slidable wings (8, 9), characterised in that the second section bar (30) used to construct the uprights (4) positioned on the front part of the furniture item has a curved upper area (31) whereon carriages (6, 7) supporting the slidable wings (8, 9) slide; a first longitudinal inner compartment (33) having a shape complementary to that of a body (40) belonging to a junction means (5); a second longitudinal inner compartment (32), open inferiorly, in which means (10, 11) able to guide the wings (8, 9) supported by the carriages (6, 7) slide; a plurality of lateral longitudinal compartments (34), able to house blocking means (44) belonging to the junction means (5).

6. The constructive structure (1) claimed in claim 5, characterised in that in the second longitudinal inner compartment (32) of the second metal section bar (30) means (12, 13) able to limit the travel of the wings (8, 9) are also located.

7. The constructive structure (1) claimed in claim 5, characterised in that the second section bar (30) has two lateral longitudinal compartments (34) on each of its longer sides.

8. The constructive structure (1) claimed in claim 5, characterised in that the second section bar (30) also has lateral longitudinal compartments (35) able to house means for levelling and stiffening the structure (1).

9. The constructive structure (1) claimed in claim 2, characterised in that, at least at one end of a portion of the first or of the second section bar (20, 30), a through hole (23) is present, in which fastening means (45), belonging to a junction means (5) and able to fasten the junction means (5) to the portion of the first or of the second section bar (20, 30), are engaged.

10. The constructive structure (1) claimed in claim 1, characterised in that the junction means (5) comprises a body (40), terminating with a widened area (41), which has through holes in which through screws (43) engaging blocking means (44) are inserted and a compartment (46), in which fastening means (45) able to fasten the junction means (5) to a portion of the first or of the second section bar (20, 30) are located.

11. The constructive structure (1) claimed in claims 9 and 10, characterised in that the fastening means (45) are able to be engaged in the through hole (23) present at least at one end of a portion of the first or of the second section bar (20, 30).

12. The constructive structure (1) claimed in claims 3, 5 and 10, characterised in that the blocking means (44) are constituted by a tapped insert whose width does not exceed the entry width (L) of the lateral longitudinal compartments (22, 34) of the first and of the second section bars (20, 30).

13. The constructive structure (1) claimed in claims 9 and 10, characterised in that the fastening means (45) are constituted by a telescopic screw which comprises a first element (45'), having an outer shape that is complementary to that of the compartment (46) of the body (40) of the junction means (5) and a threaded axial hole, and a second element (45") having a threaded stem to be screwed in the threaded hole of the first element (45'), the first and the second element (45', 45") having a head with a shape complementary to that of the through hole (23) present at least at one end of a portion of the first or of the second section bar (20, 30).

14. The constructive structure (1) claimed in claim 10, characterised in that the widened area (41) has a plurality of recesses (47) distributed along its periphery and able to receive, in the crossing points between an upright (2) and a cross member (3, 4), panels for closing the furniture item.

15. The constructive structure (1) claimed in claim 3, 5 and 10, characterised in that the widened area (41) also has, at the through holes present in the body (40) of the junction means (5), two square guiding projections (42) whose side is no greater than the width of the lateral longitudinal compartments (22, 34) of the first and of the second section bars (20, 30).

16. The constructive structure (1) claimed in at least one of the previous claims, characterised in that, to couple by means of a joint (5) a cross member (3, 4), constituted by a portion of section bar (20, 30), to an upright (2) and/or to another cross member (3, 4):

- the blocking means (44) of the joint 5 are inserted in the lateral longitudinal compartments (22, 34) of the upright (2) or of the other cross member (3, 4) and they are locked in place with the through holes (43); and
- the body (40) of the joint (5) is inserted into the end of the cross member (3, 4) and it is locked in place by inserting the ends of the fastening means (45', 45") into the through hole (23) present at one end of the cross member (3, 4).

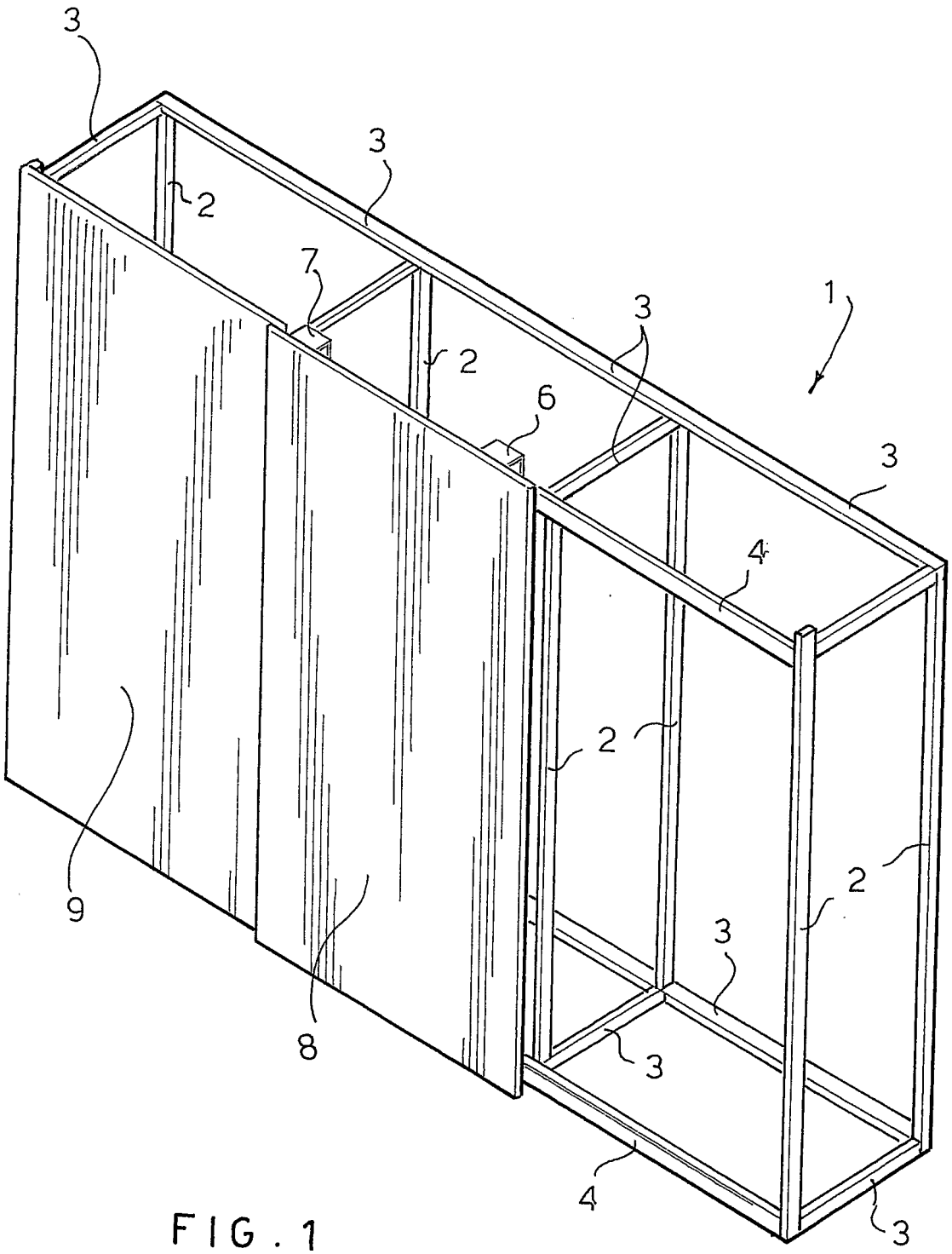
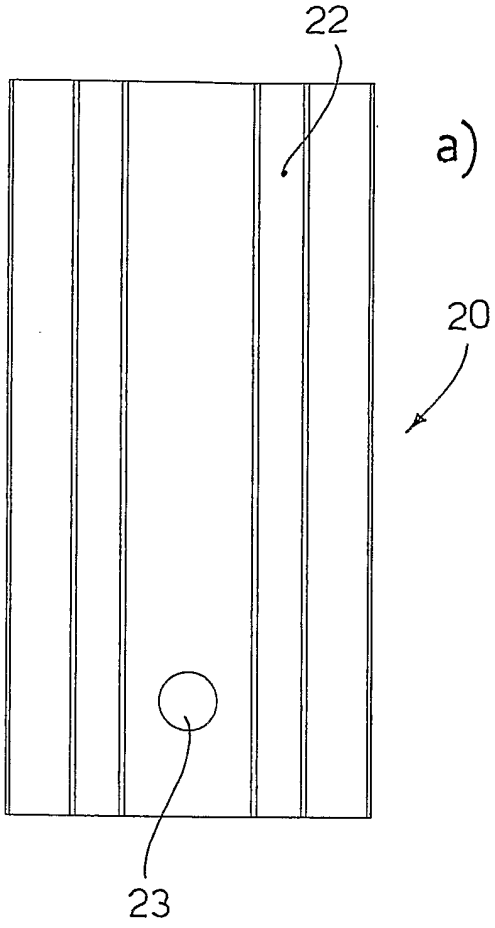
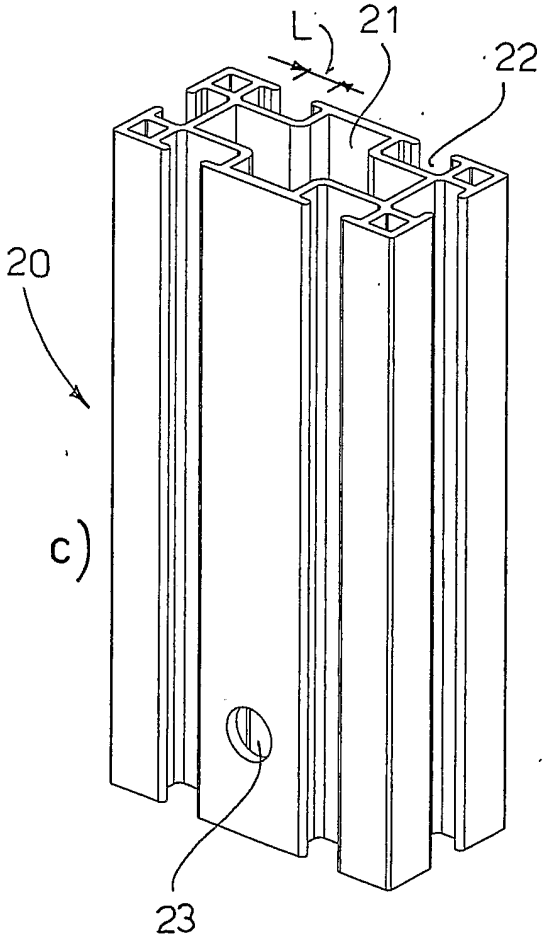
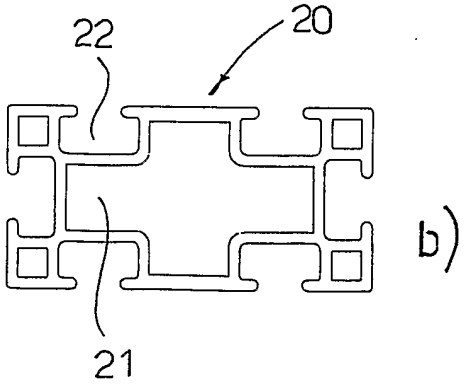


FIG. 1

FIG. 2







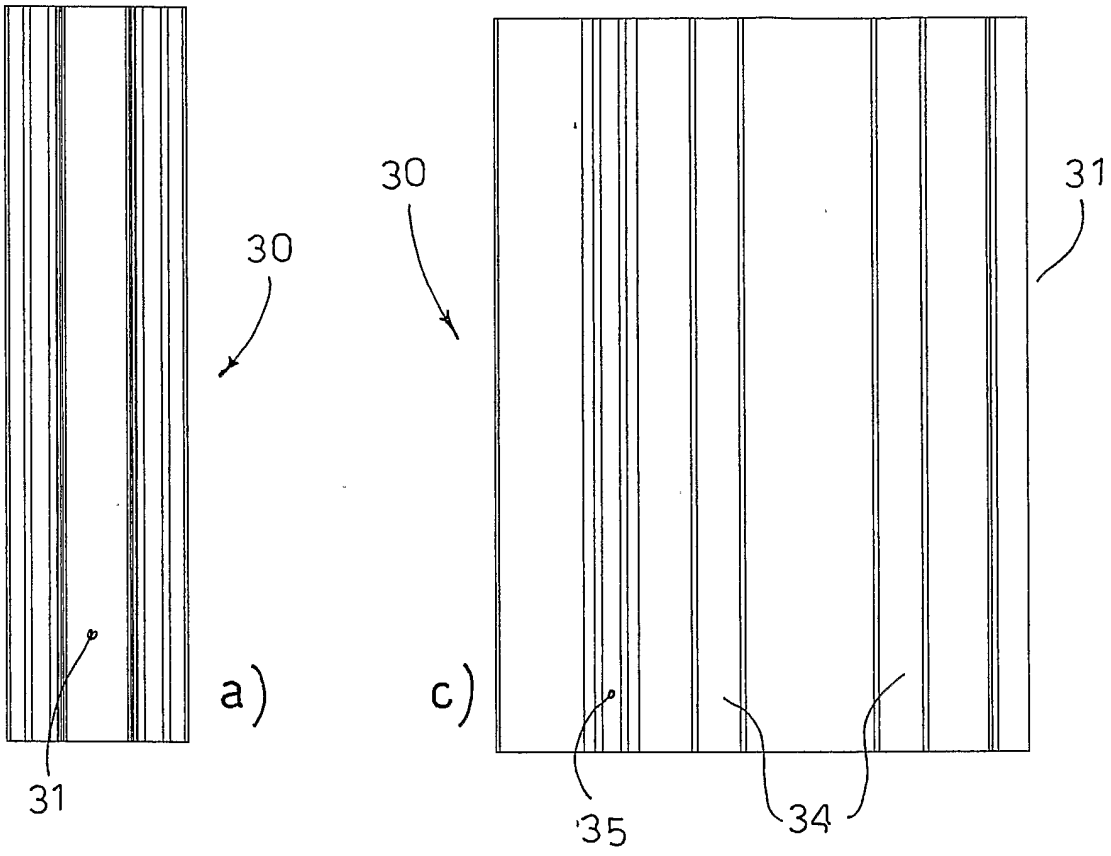
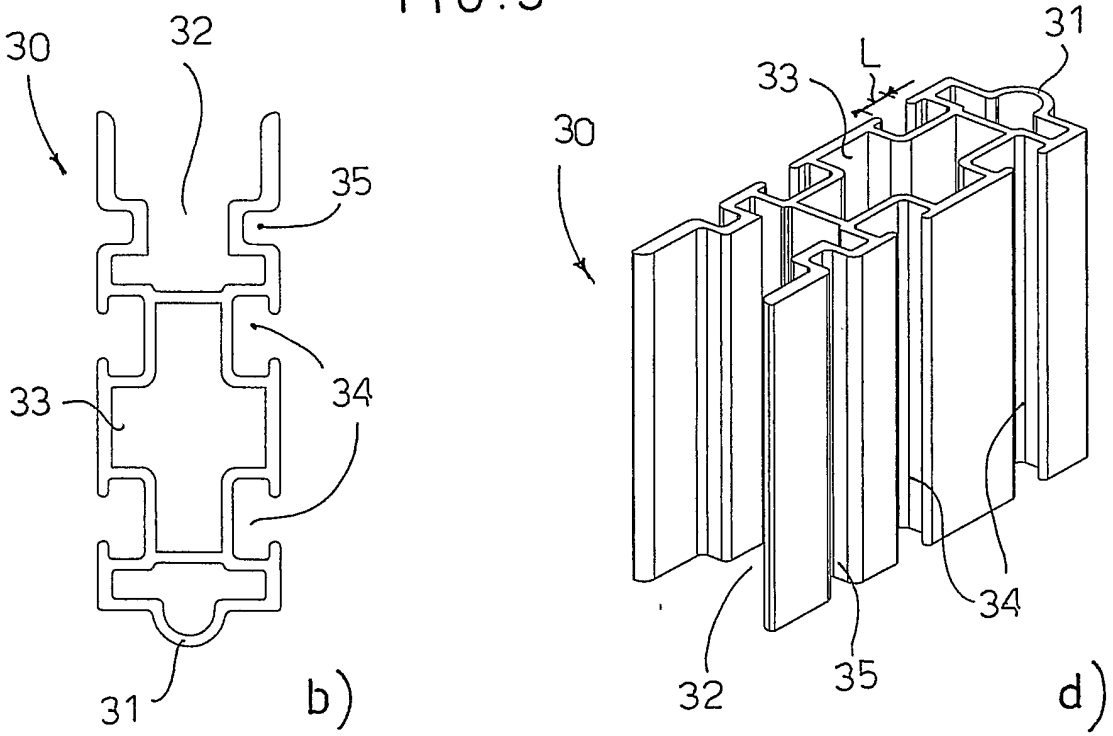
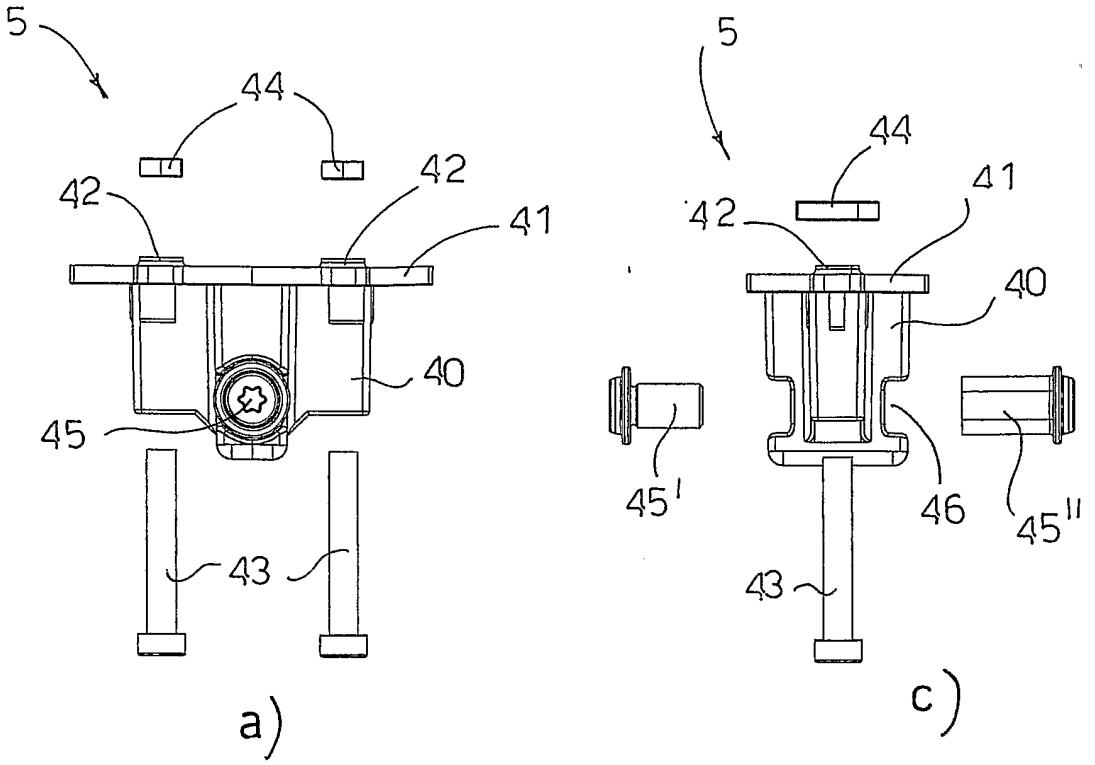


FIG.3

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a)
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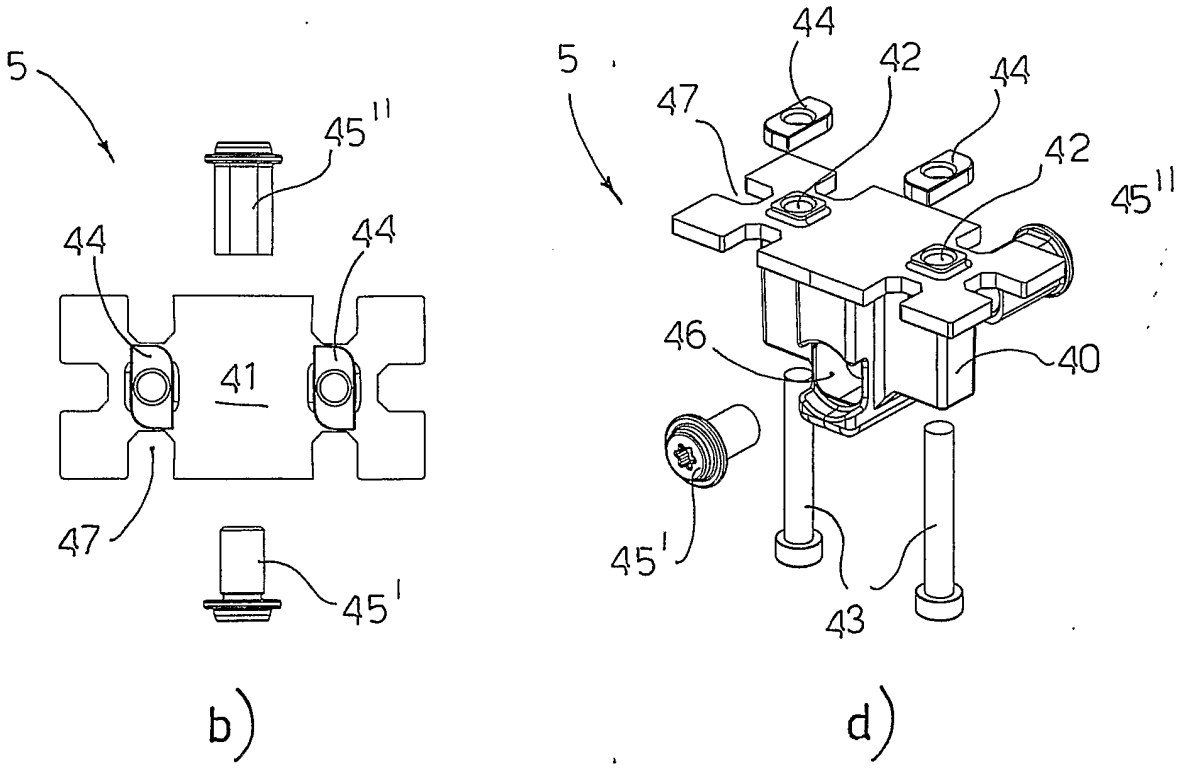
FIG.4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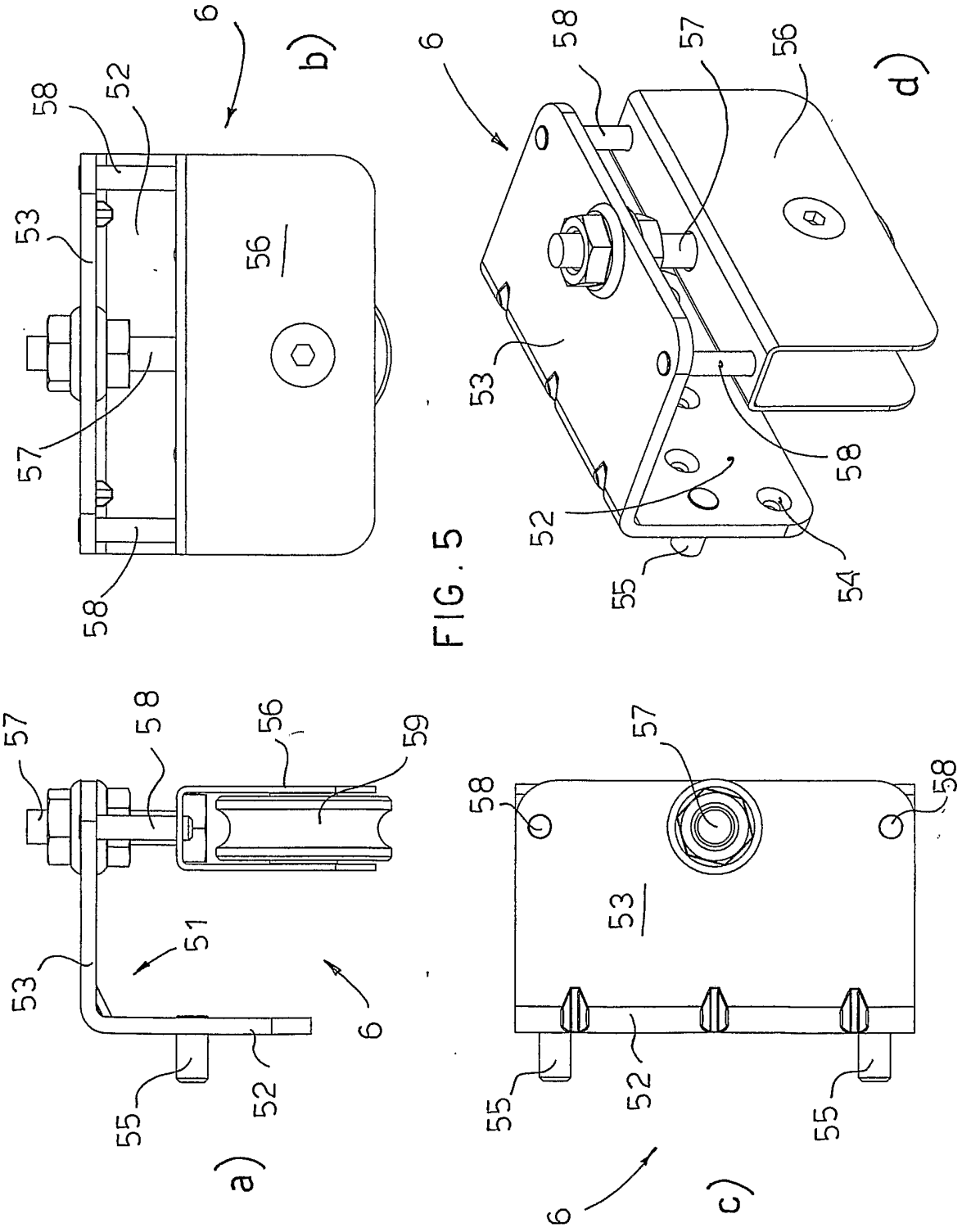
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58
59
56
51
53
6
55
52
a)
58
57
58
53
55
52
55
6
c)

FIG. 5

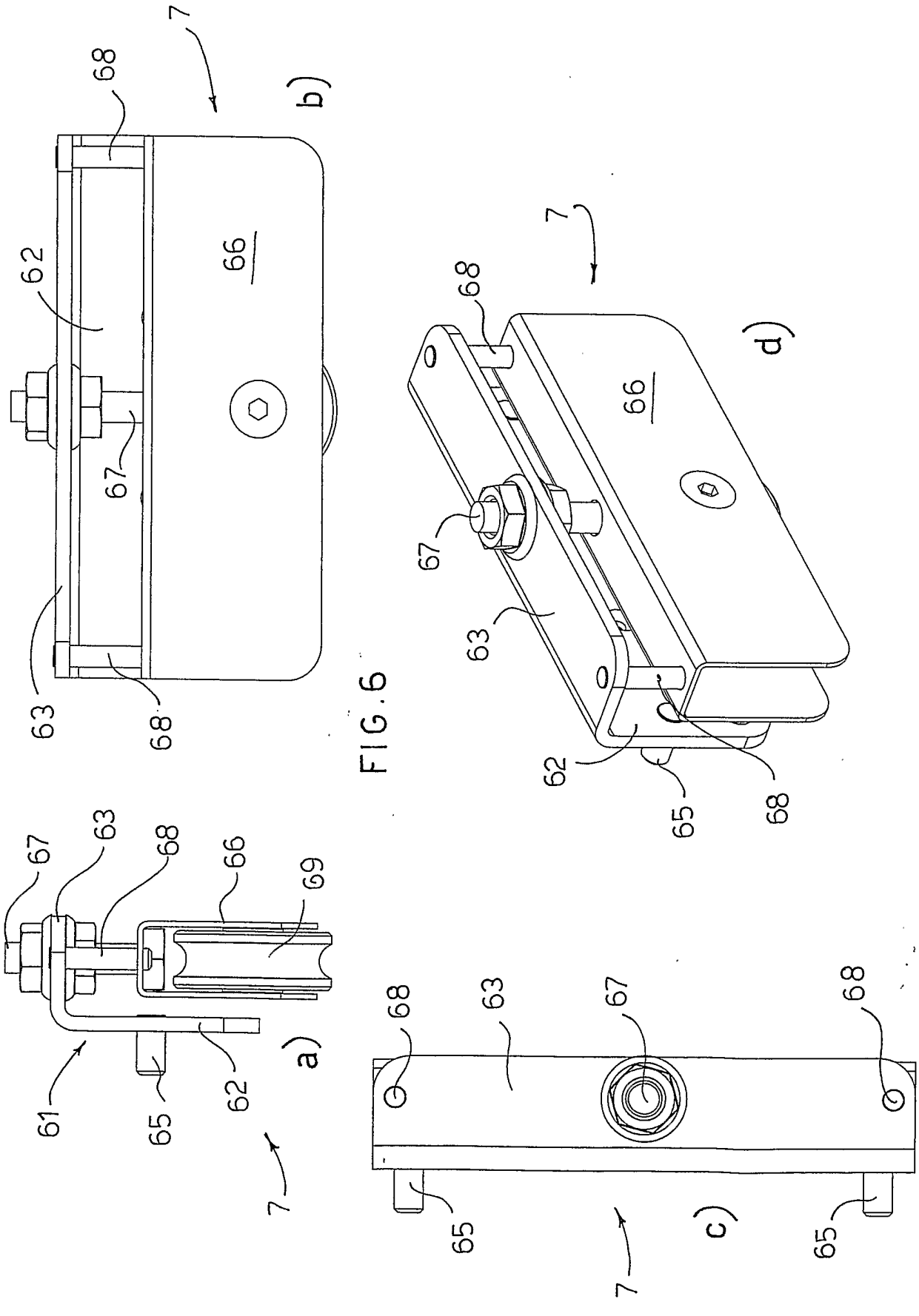
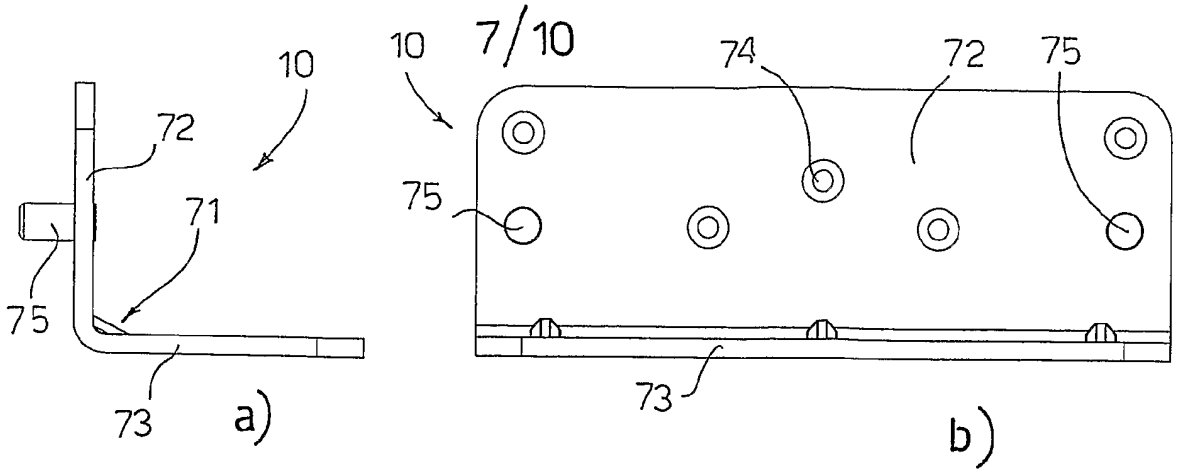

7
68
b)
62
66
67
63
68
7
68
d)
66
67
63
62
65
68
67
63
68
66
69
61
65
62
a)
7
68
63
67
68
c)
65
65
7

FIG.6


10
72
71
75
73
a)
10
74
72
75
75
73
b)

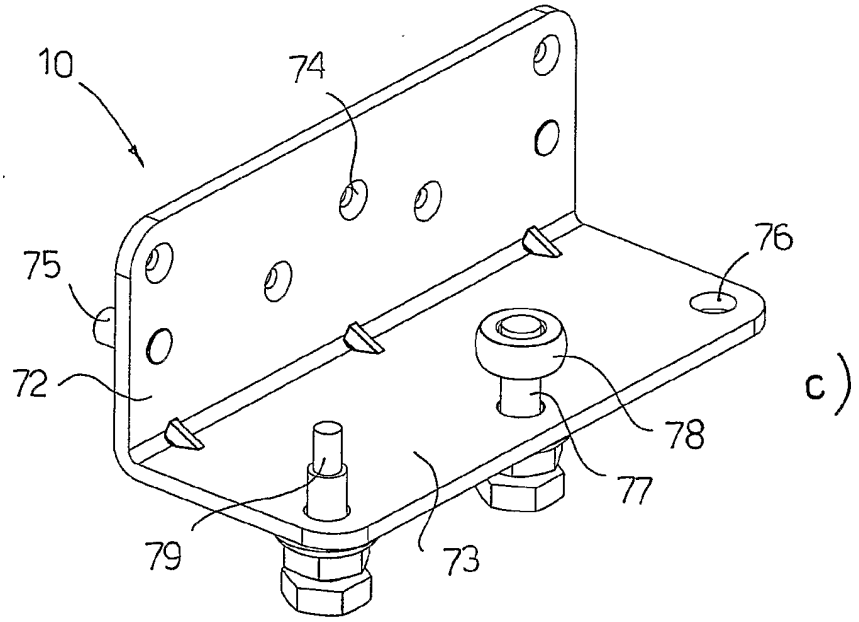
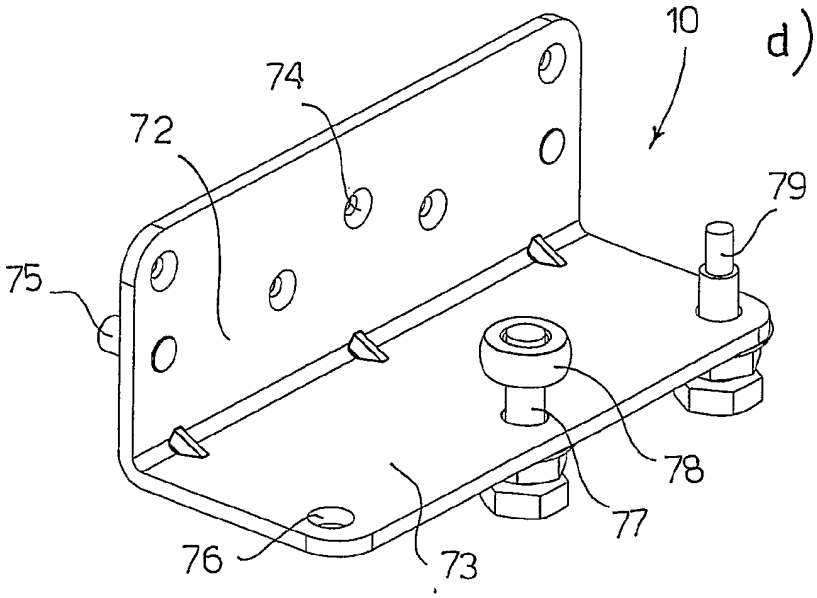

10
74
76
75
72
78
77
79
73
c)

FIG.7


10
d)
74
72
79
75
78
77
76
73

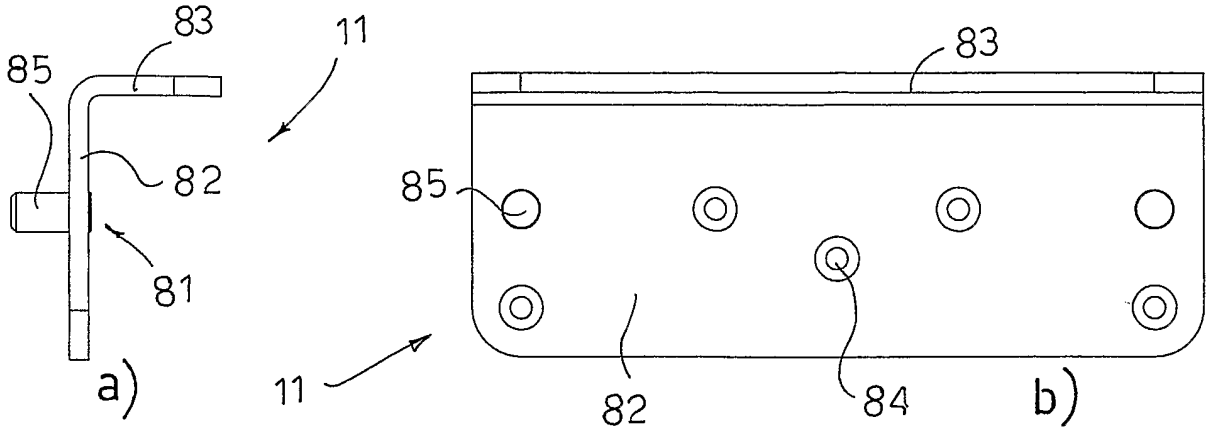
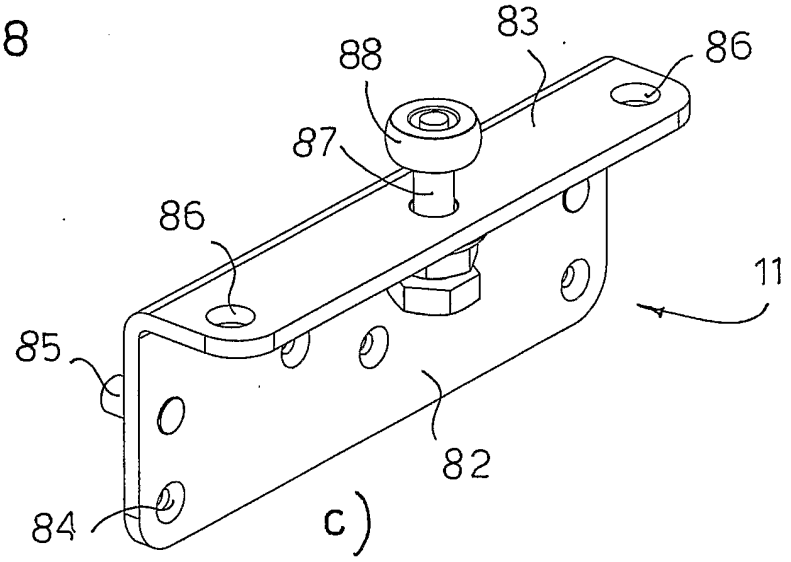

83
11
85
82
81
a)
11
83
85
82
84
b)

FIG.8


88
83
86
87
86
11
85
82
84
c)

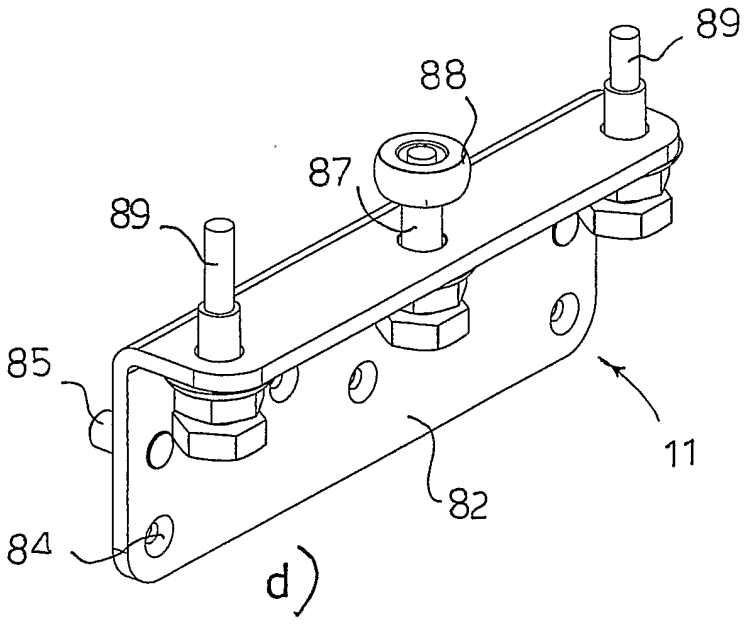
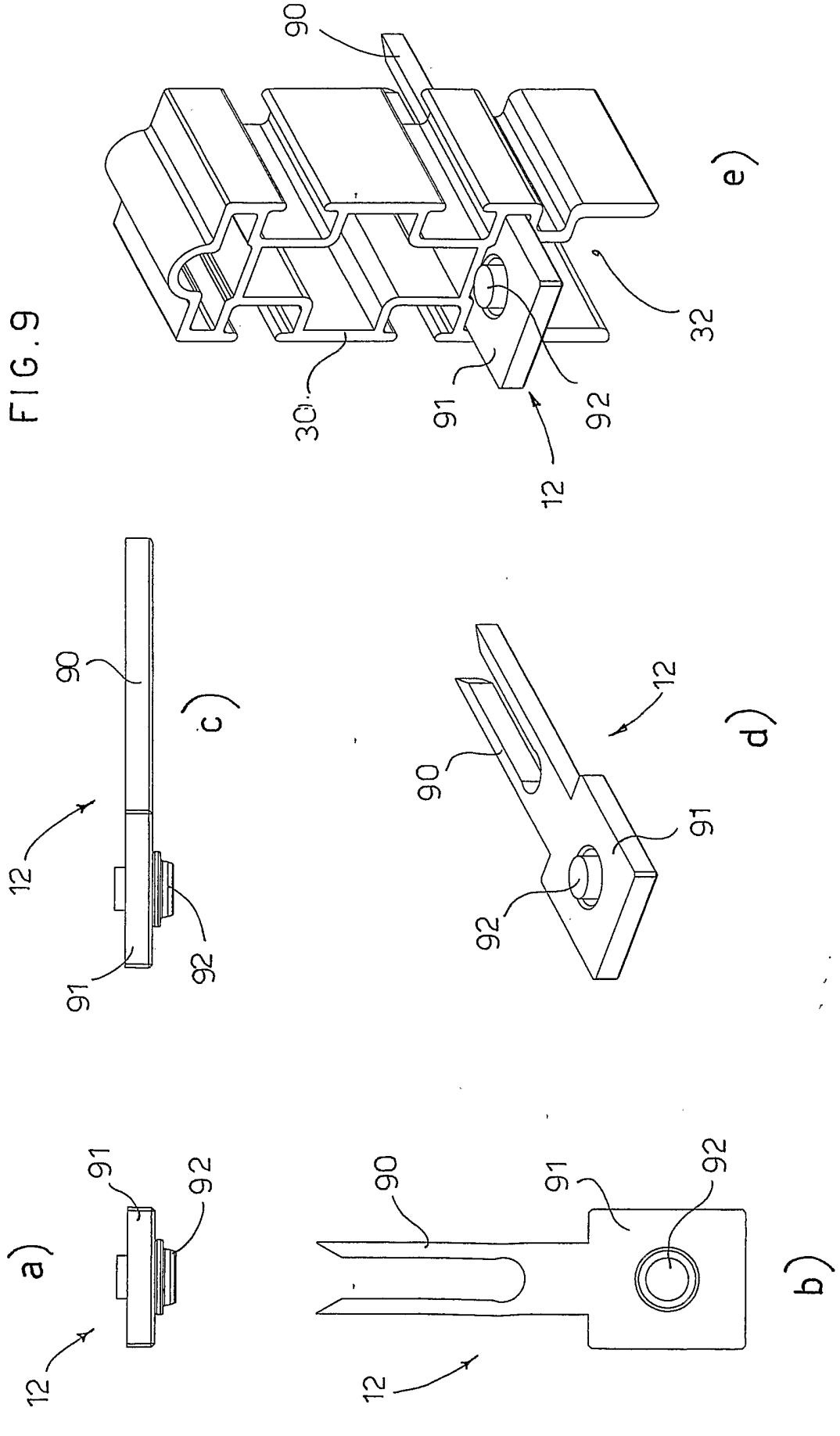

89
88
87
89
85
11
82
84
d)

FIG.9



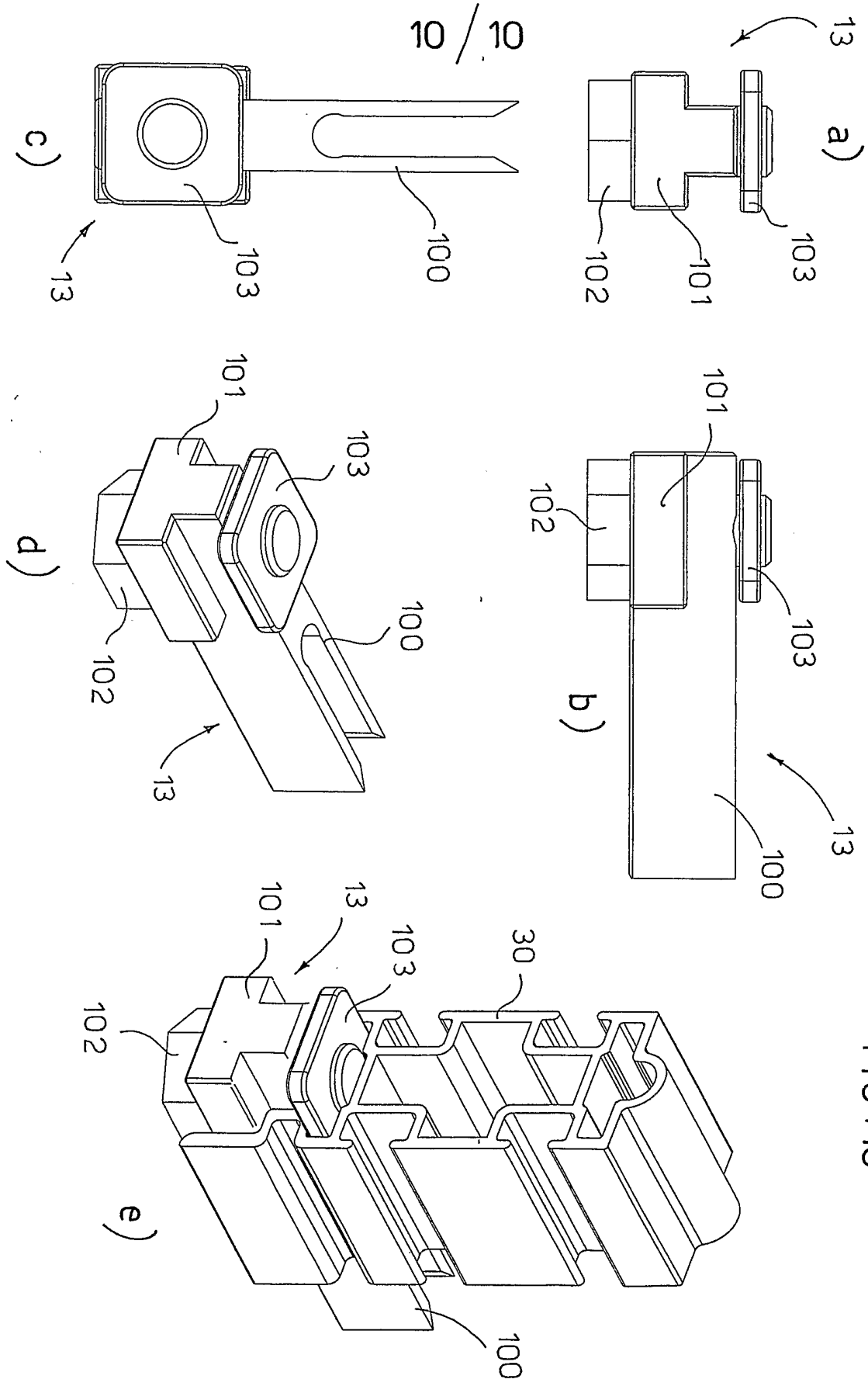

a)
13
101
102
103
b)
101
102
103
13
100
c)
13
103
100
d)
101
103
102
100
13
e)
101
13
103
30
102
100

FIG. 10

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2006/001186

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47B57/26 F16B12/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A47B F16B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 583 359 A (STAEGER ET AL) 22 April 1986 (1986-04-22) abstract; figures 6,8,9 column 3, line 15 - column 4, last paragraph	1-3,9,16
X	US 3 574 367 A (JOHANNES JANKOWSKI) 13 April 1971 (1971-04-13) abstract; figure 1 claim 1	1-3,10, 14
X	US 4 163 537 A (MOURGUE, PASCAL N) 7 August 1979 (1979-08-07) abstract; figures 1,2 column 2, line 31 - column 3, line 21	1,2

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 May 2006	01/06/2006

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Jones, C

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2006/001186

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	BE 562 799 A (ALKONO) 3 June 1960 (1960-06-03) the whole document -----	1-16
A	DE 203 09 331 U1 (RICHMANN, CARSTEN DIETER) 11 September 2003 (2003-09-11) the whole document -----	1-16

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2006/001186

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4583359 A	22-04-1986	CA 1236678 A1	17-05-1988
		DE 3342616 A1	05-06-1985
		EP 0144030 A2	12-06-1985
		ES 282162 U	16-04-1985
US 3574367 A	13-04-1971	AT 293111 B	27-09-1971
		CH 503171 A	15-02-1971
		DE 1650975 A1	22-10-1970
		FR 2000838 A5	12-09-1969
		GB 1254723 A	24-11-1971
US 4163537 A	07-08-1979	CA 1078446 A1	27-05-1980
		DE 2731514 A1	02-02-1978
		DE 7721896 U1	09-08-1979
		ES 229912 Y	16-01-1978
		FR 2358127 A1	10-02-1978
BE 562799 A		NL 95711 C	
DE 20309331 U1	11-09-2003	NONE	