



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.03.2016 Bulletin 2016/12

(51) Int Cl.:
A47B 47/02 (2006.01)

(21) Application number: **15185382.7**

(22) Date of filing: **16.09.2015**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA

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(30) Priority: **17.09.2014 IT TV20140134**

(54) **MODULAR COMPONENT OF FURNITURE ITEM**

(57) To improve the production of a furniture item, there is described a parallelepiped modular component (10) of the furniture item, comprising two rectangular side panels (12) and four section bars (40, 42, 44, 46) of equal

length respectively fixed between the four vertices of the rectangular panels to keep them spaced apart and parallel.

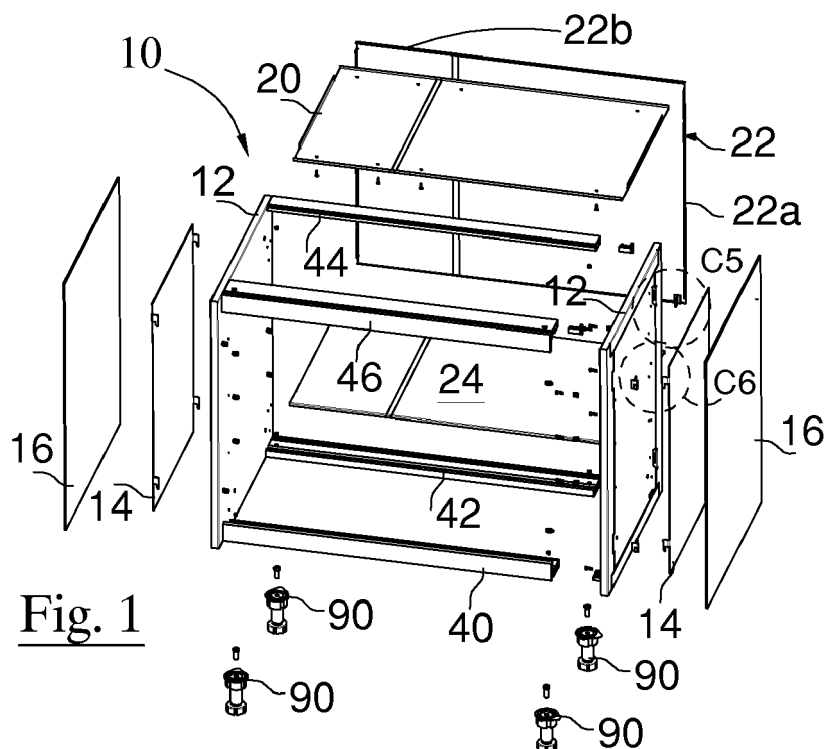


Fig. 1

Description

[0001] The invention relates to a modular component of a furniture item, in particular a kitchen cabinet herein discussed as an example.

[0002] Today's kitchen cabinets and their modules are made by assembling various pressed-chipboard panels with wooden pins, one material that has several disadvantages: not only it is expected that its cost will grow because the stocks will decrease due to the parallel and growing pellet production, but formaldehyde emissions are toxic and greatly limit the recycling thereof. It is also poorly resistant to water and moisture.

[0003] There are also known cabinets made entirely of metal, e.g. in USD45235 or in US1246313, but they have a construction which is extremely complex, heavy, non-modular and not at all suitable for the mass production.

[0004] This state of the art is meant to be improved by the component for furniture item defined in claim 1, which solves the problem of providing a piece of furniture which is modular, simple to assemble and/or easy to adapt to different sizes and/or made of recyclable material.

[0005] It is therefore proposed a parallelepiped modular component of a furniture item, comprising two rectangular side panels and four section bars of equal length respectively fixed between the four vertices of the rectangular panels to keep them spaced apart and parallel.

[0006] This structure is easy to assemble, solid and constructible entirely of metal, lightweight and recyclable materials.

[0007] As advantageous variants, one can have that

- the side panels are made of bent metal sheet in order to form a box-shaped structure, in order to reinforce the sides of the module. The box-shaped structure may have folded edges in which there is a pass-through slot adapted to be coupled with a hook present on a panel. This simplifies and shortens the assembly. To improve the assembly, the pass-through slot and the hook may be coupled by an element which comprises a first portion removably insertable with interlocking fit into the pass-through slot, and a second portion comprising a connection for a hook integral with a side panel; and/or
- the component may comprise one or more infill panels to fill an opening bounded by two section bars and two rectangular panels, in order to have a module that delimits a closed compartment. A or each section may comprise longitudinal grooves in which one curved end of an infill panel can be fitted, so as to simplify the assembly and reduce to a minimum or zero the fastening means; and/or
- a or each section bar may comprise a rectilinear recess which forms a depression parallel to an abut-

ment surface for the rectangular panels. In the recess fixing means can be concealed. E.g. the recess can accommodate a fastening means adapted to fit a foot to one of the section bars; and/or

- a or each infill panel may be composed of two panels partially overlapping and relatively displaceable, to reduce the warehouse storage and the adaptability to various sizes of the module; and/or
- a or each section may comprise two elongated sub-elements, placed at 90 degrees one relative to each other and joined at a common end, each sub-element comprising grooves as defined above. The assembly of two sub-elements constitutes a dihedral angle and allows joining two orthogonal panels to the same profile.

[0008] Note that for *rectangular* here it is meant a shape with four two-by-two parallel sides and of which sides at least two are equal, being therefore comprised the square shape.

[0009] It is also proposed a method comprising, or a machine that executes, the steps of producing a modular, parallelepiped component of a piece of furniture, by fixing at the ends of four section bars of equal length respectively the four vertices of two rectangular side panels to keep the two panels parallel and spaced apart.

[0010] Variants of the machine or of the method are:

- producing the side panels by bending sheet metal so as to form a box-shaped structure; and/or
- folding the edges in the box-shaped structure, and preferably creating a pass-through slot; and/or
- fixing and overlapping to the side panels another panel by tucking hook-shaped shapings present in a panel into corresponding slots present in another panel; and/or
- mounting infill panels to fill an opening delimited by two section bars and two rectangular panels; and/or
- producing in a or each section bar longitudinal grooves in which one curved end of an infill panel is insertable; and/or
- producing in a or each section bar a straight recess which forms a depression parallel to an abutment surface for the rectangular panels, and housing in the recess a fixing means adapted to fix a foot to one of the section bar; and/or
- using for a or each infill panel panels (that are) partially overlapping and relatively displaceable.

[0011] The advantages of the component according to the invention will be made still clearer by the following description of a preferred embodiment, which refers to the attached drawing in which

Figure 1 shows an exploded three-dimensional view from behind of a modular component for piece of furniture;

Figure 2 shows a front view of the component in figure 1 when assembled;

Figure 3 shows a sectional view according to the plane III-III in Figure 2;

Figure 4 shows an enlargement of the circle C1 of Figure 3;

Figure 5 shows an enlargement of the circle C2 of Figure 3;

Figure 6 shows an enlargement of the circle C3 of Figure 3;

Figure 7 shows an enlargement of the circle C4 of Figure 3;

Figure 8 shows an enlargement of the circle C5 in figure 1;

Figure 9 shows an enlargement of the circle C6 in Figure 1;

Figure 10 shows a three dimensional view of a component zoomed present in figure 9;

Figure 11 shows a side view of the component in FIGURE 10;

Figure 12 shows an enlarged view of a detail of the section on the plane XII-XII in Figure 2;

Figures 13:14 show enlargements of two details of the component.

[0012] In the figures, same reference numerals designate same parts, and the component is described as in use. In order not to crowd the drawings for equal parts the numerical references are not always reported.

[0013] Figure 1 shows an exploded view of a modular component 10 to be used for composing cabinets, e.g. kitchen cabinets. The component 10 comprises a bearing structure formed by four section bars 40, 42, 44, 46 mounted horizontally spaced apart, parallel to one another and fixed at the four vertices of two rectangular side panels 12. The union of the previous pieces forms a parallelepiped "box" that defines the size and the skeleton of the assembled component 10.

[0014] To the section bars 40, 42, 44, 46 a top panel 20, a back panel 22 and a bottom panel 24 can be coupled, so as to close the openings between the section bars.

5 **[0015]** A great advantage of the component 10 is that its width is settable only by cutting the desired length of the section bars 40, 42, 44, 46. Indeed, preferably all or one of the panels 20, 22, 24 are formed by two superimposed sheets or planes (indicated e.g. with 22a, 22b), so as to easily adjust their total area by only moving two sheets or planes relatively to each other. The same solution can be adopted for some shelves (not shown), arranged inside the compartment, which extend between the two panels 12.

10 **[0016]** To give strength and rigidity to the component 10 the side panels 12 are not simple sheets of flat metal sheet but preferably are bent (see Figure 8) to form a box-like structure: the margins of the metal sheet are C-folded towards the center of the sheet on all four sides of the panel. Thus the sides of the side panels 12 are made from a reinforced frame FR thanks to the bending of the sheet metal. The frame FR has C-shaped cross-section and in the space inside the C one may advantageously mount accessories of or for the component 10, such as e.g. electrical wiring (which remain concealed and protected), a hinge or an opening mechanism for a door which closes the access to the internal compartment to the component 10. For example, in the art the problem of concealing transdom door-opening mechanisms, quite bulky and unattractive, is very felt. By putting the mechanism within the space inside the C they remain invisible and protected (to this aim on the edge of the frame FR there may be a slot to get a movable arm out of the mechanism in order to support the door).

20 **[0017]** By optionally giving a particular shape to one or each of the section bars 40, 42, 44, 46 advantageous effects can be obtained. Altogether, to give rigidity, the section bars 40, 42, 44, 46 have closed, and for example substantially rectangular, section. As can be seen from Figures 2, 3, 4-7 the section bars 40, 46, relative to the side of the component 10 which remains open for access to the interior compartment, are formed by two profiled sub-elements 70, 72 placed at 90 degrees to each other, so as to delimit a right dihedral angle, and are joined at one common end. Note that advantageously the section bars 40, 46 may be equal.

25 **[0018]** The section bars 40, 46, and/or also the other section bars 42, 44, may have one or more longitudinal grooves 76 in which to trap by pressure folded ends R of the panels 20, 22, 24. Not just they thereby eliminate or reduce the fixing means for the panels 20, 22, 24 to the section bars 40, 42, 44, 46, but by obtaining on the section bars 40, 42, 44, 46 various longitudinal grooves 76 arranged side by side it is possible to use the same panels 20, 22, 24 for various dimensions of the component 10. Note that in Figure 1 the panel 22 is shown on the opposite side of the section bars 40, 46 because it has smaller dimensions of the rectangular opening

bounded by the section bars 42, 44 and by the panels 12, and thus it is mounted by inserting it frontally.

[0019] Another merit of the section 40 or 42 can be an easy and solid connection to foots or sockets 90 of the component 10 (see Figure 1 and 12). The sub-element 70 has, e.g. adjacent and arranged parallel to a groove 76, a flat supporting portion or surface 80 for the panel and a second portion or surface 82, adjacent or near to the first portion or surface but lying on a plane, e.g. parallel, closer to the center of the section bar. The second portion or surface 82 forms the bottom of a longitudinal recess V (Figure 6 and 7), which e.g. extends parallel to the groove 76. The surface or portion 82, which e.g. is parallel to the surface or portion 80, may be the abutment for a fixing screw 84 for the underlying foot 90 - and fixed - at sub-element 70. The screw head remains housed in the recess V and is covered by the panel 24, remaining invisible. Thus there are no visible or projecting screws that impair the continuous and smooth surface of the panel 24.

[0020] It is preferable, for aesthetic reasons and soundproofing, to externally coat the side panels 12. Therefore finishing panels 16 are applied and fixed via a fixing plane 14, which to facilitate removal and/or replacement is coupled through hooks to one of the side panels 12. The fastening system is best shown in Figures 8, 9, 10, 11. The terminal part of the frame FR comprises a tab 60 further folded by 90 degrees towards the main plane of the panel 12. In the tab 60, which may be a folded edge portion, there is provided a pass-through slot 62 which has two sections with different widths. In the slot 62 the T-shaped shank 58 belonging to a hook 50 is insertable (Figure 10 and 11). The hook 50 comprises a base plate 52, from which protrudes on one side part of the hook 50 and on the other a second plate 54 having a notch 56. The shank 58 can enter the larger width of the slot 62, but cannot get out from the smaller one, and therefore it can remain attached to the frame FR by making the second plate 54 protrude toward the center of the panel 12. A finishing panel 16 it is preferably equipped with a hook 18, e.g. obtained by die-cutting and then folding an edge of its, which is hooked into the slot 56. Therefore one can connect the panel 16 to the panel 12 by means of bayonet coupling, solid and easily removable.

[0021] Another advantage of the component is that the above-mentioned section bars can be easily and solidly connected to the panels 12 (see Figure 13 and 14) by means of an advantageous connection element and/or method. One can use an insert 102 (Figure 13) comprising an L-shaped block, then having two parallelepiped portions 104, 106 placed at 90 degrees to each other. Both can be inserted and screwed inside the central cavity of a section bar, while a T-shaped shank 108 (similar to the shank 58), present on the portion 104, can be inserted into a slot 110 present on the plane of the panel 12 (Figure 14). This slot 110 is equal to the slot 62 already described, and uses the same type of coupling as with the shank 58. It has the advantage of a fast and precise

fixing. Another variant of connecting element 92 is shown in Figure 14. The element 92 comprises a block 94 with an L-shaped cross-section, and a parallelepiped portion 96 adjacent to the short side of the L and contiguous with respect to the base section. The element 92 may be inserted and screwed inside the central cavity of a section bar, while a T-shaped shank 98 (analogous to the shank 58 and 108), present on the base of the L, can be inserted into the slot 110, getting advantage of a quick and precise fastening.

[0022] In Figure 14 one can appreciate a system, which is a junction block, for blocking the element 92 to a section bar. The element 92, in particular on the block 94, may have a hole 150, pass-through or not; and the section bar may have a hole 160, pass-through or not, corresponding to the hole 150. That is to say that when the element 92 is inserted into the section bar, the two holes 150, 160 are aligned. One can then insert a screw or a dowel in the holes 150, 160 and lock the two pieces one into the other. The fixing is fast, simple and allows an equally fast disassembly. The same system comprising the two holes 150, 160 can be implemented in the insert 102.

[0023] Preferably the described panels 20 and/or the section bars are produced in aluminum, which is recyclable and light.

[0024] The component 10 can be associated or juxtaposed with other equal components or of different size, getting an overall cabinet which is simple to build.

Claims

1. Parallelepiped modular component (10) of a furniture item, comprising two rectangular side panels (12) and four section bars (40, 42, 44, 46) of equal length respectively fixed between the four vertices of the rectangular panels to keep them spaced apart and parallel.
2. Component according to claim 1, wherein the side panels are made of bent metal sheet in order to form a box-shaped structure.
3. Component according to claim 2, wherein the box-shaped structure has folded edges (FR) in which there is a pass-through slot (62) adapted to be coupled with a hook (18) present on a panel.
4. Component according to claim 3, wherein the pass-through slot (62) and the hook (18) are coupled by an element which comprises a first portion removably insertable by interlocking fit in the pass-through slot, and a second portion comprising a connection for a hook integral with a side panel.
5. Component according to claim 1 or 2 or 3 or 4, com-

prising one or more infill panels (14, 16, 22, 24, 20)
for filling an opening bounded by two section bars
and two rectangular panels.

6. Component according to claim 5, wherein a or each section bars comprise longitudinal grooves (76) in which a curved end (R) of an infill panel can be fitted. 5
7. Component according to any one of the preceding claims, wherein a or each section bar comprises a rectilinear recess (V) which forms a depression parallel to an abutment surface (80) for the rectangular panels. 10
8. Component according to claim 7, wherein the recess accommodates a fastening means (84) adapted to fix a foot (90) to one of the section bars. 15
9. Component according to claim 5 or 6 or 7 or 8, wherein a or each infill panel is composed of two panels (22a, 22b) partially overlapping and relatively displaceable. 20
10. Component according to any one of the preceding claims, wherein a or each section bar (40, 42, 44, 46) comprises two elongated sub-elements (70, 72), placed at 90 degrees relative to each other and joined at a common end, each sub-element comprising grooves (76) as defined in claim 6. 25

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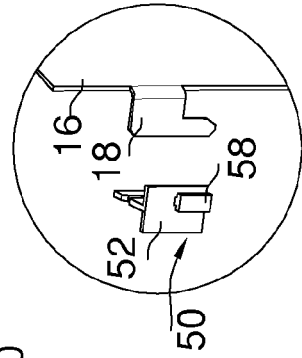
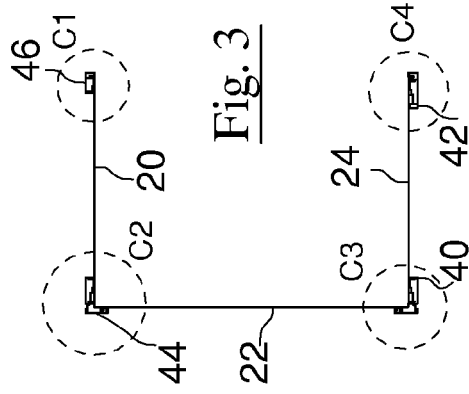
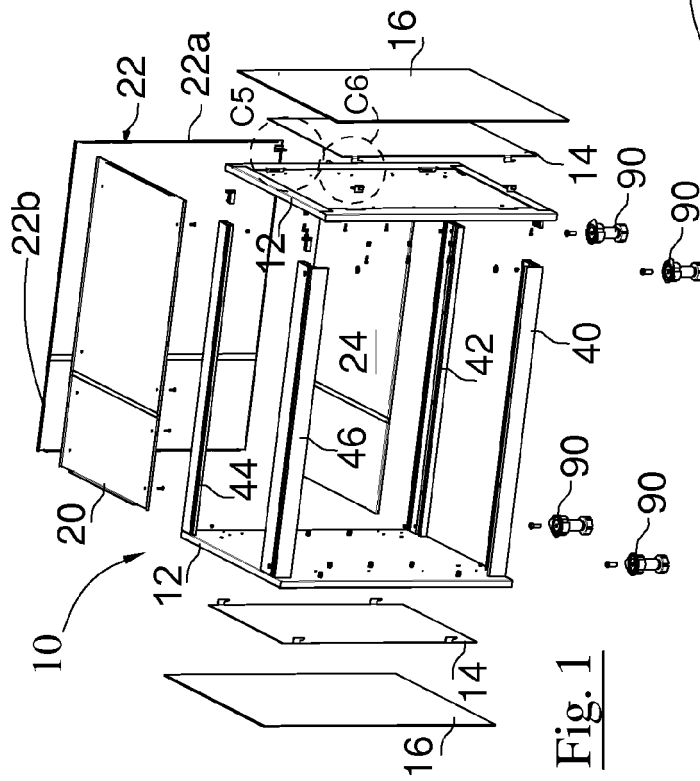
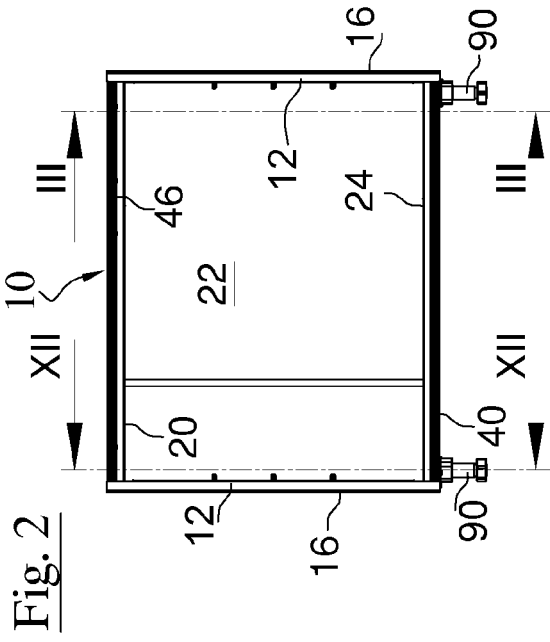
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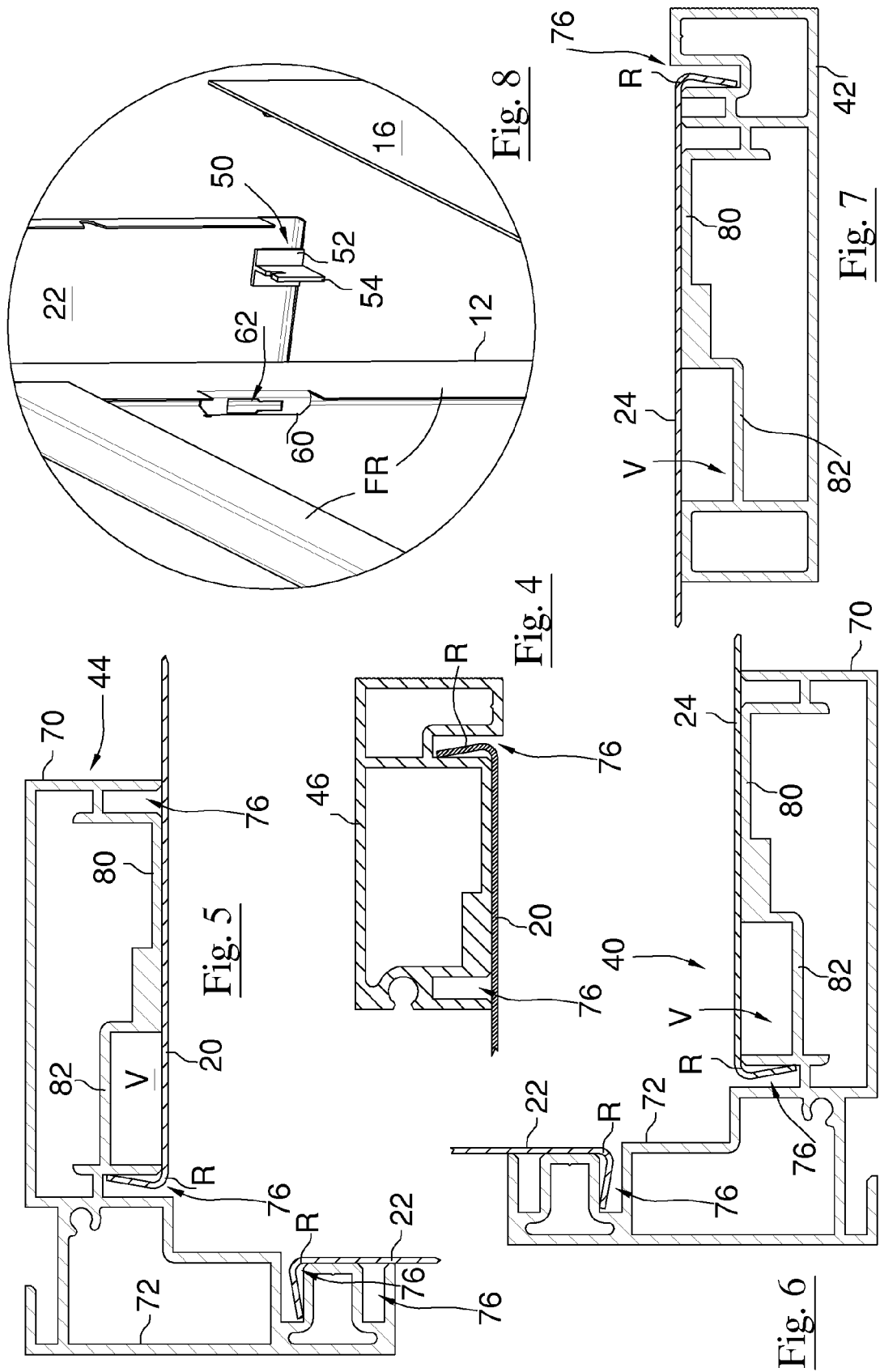


Fig. 13

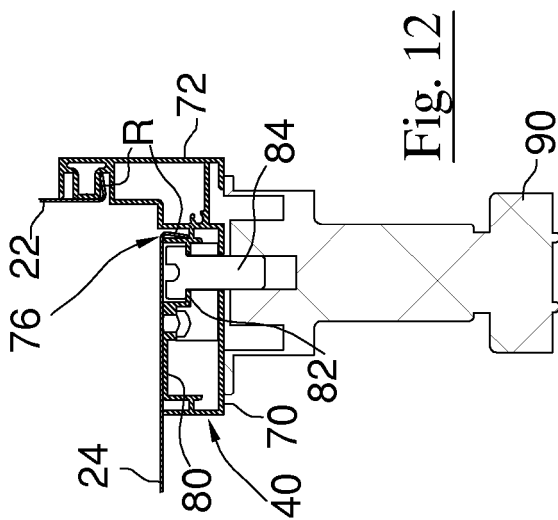
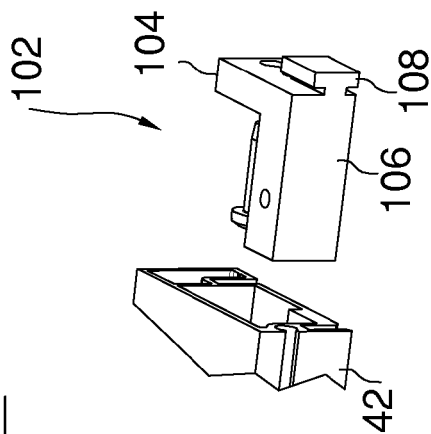


Fig. 12

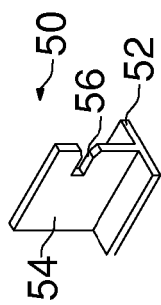


Fig. 10

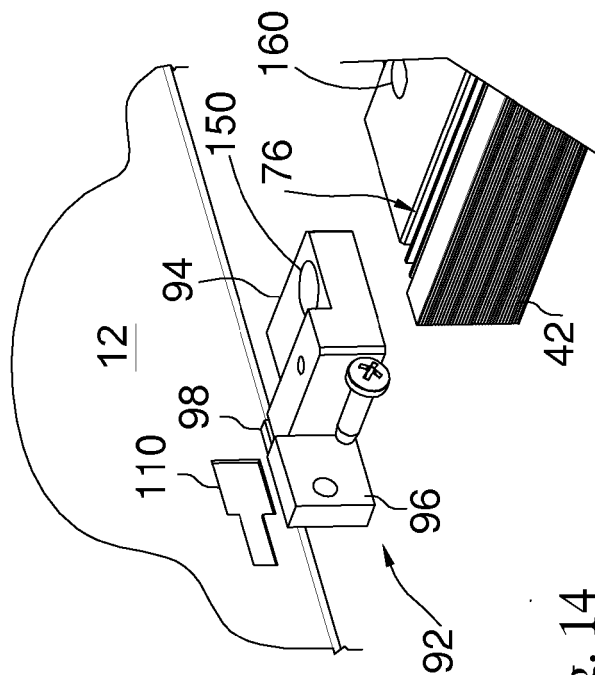


Fig. 14

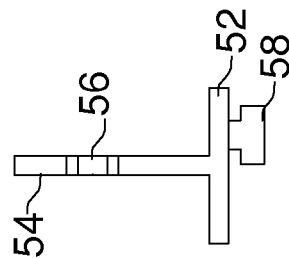


Fig. 11



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Place of search The Hague		Date of completion of the search 3 February 2016	Examiner Kohler, Pierre
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