(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 253 263 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
30.10.2002 Bulletin 2002/44

(51) Int Cl.[7]: **E04F 19/04**, B21D 35/00

(21) Application number: **02425105.0**

(22) Date of filing: **27.02.2002**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **24.04.2001 IT MI010856**

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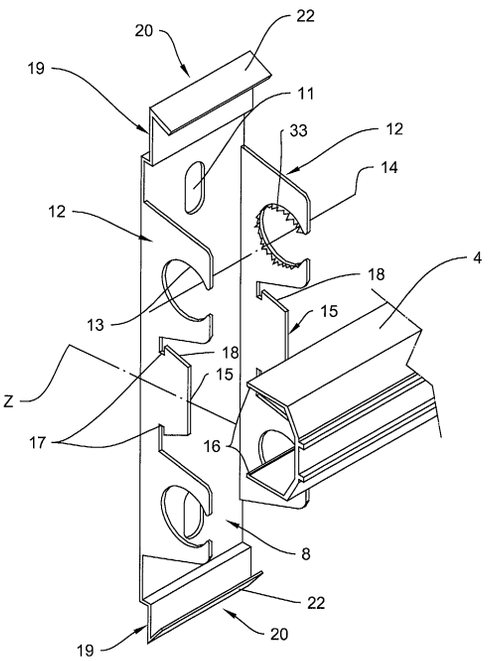
(54) A supporting element of a modular structure for making moldings along buildings' walls

(57) A supporting element of a modular structure for making mouldings along buildings' walls comprises a first plate (8) to be rigidly fastened to a wall of a building by a fastening face (8a) thereof turned towards the wall itself; at least one second plate (12) rigidly in engagement with the first plate (8), disposed on the face of the first plate (8) opposite to the fastening face (8a) and in a direction substantially perpendicular to said first plate (8); at least one coupling housing (13) formed in said second plate (12) and adapted to receive a connecting insert (7) of a modular-structure (1) end element (6) for making mouldings.

FIG.2



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Description

[0001] The present invention relates to a supporting element of a modular structure for making mouldings along buildings' walls, of the type comprising the features set out in the preamble of claim 1.

[0002] In particular, the supporting element in accordance with the invention is adapted to fasten bumper mouldings and/or similar structures to the walls of hospitals, supermarkets and similar premises, to protect the walls themselves against impacts and/or to supply a support or grip point to facilitate walking.

[0003] For the purpose, section members made of extruded aluminium for example, are used which are adapted to be fastened to the wall of a building. In particular the presence of several section members obtained by cutting to size a continuously extruded workpiece is provided, which section members are such aligned as to follow the extension of the building walls.

[0004] Each section member abuts onto the next one so as to ensure a continuity on the wall. One or more covering elements of plastic material designed to give the finishing touch to the visible moulding surface are then snap fitted onto said section members.

[0005] To carry out finishing of the moulding at the ends and connect two angularly-disposed section members so as to follow the extension of the walls close to an angle, engagement between the end elements and/or L-shaped bars and the ends of each section member is also provided, each element having connecting inserts adapted to be fitted in appropriate coupling housings defined by the section members themselves.

[0006] When insertion has been completed, each connecting insert is adapted to be locked in the coupling housing by at least one locking peg insertable through holes formed in the section member and in the insert itself.

[0007] Such a type of moulding is described in document EP1041219 in the name of the same Applicant.

[0008] Also proposed in this document is a lightened version comprising supporting elements each consisting of a section member portion of reduced length, just as an indication on the order of 3-5 cm. These supporting elements, in alignment and suitably spaced apart from each other, support one or more covering elements extending between one supporting element and the next one.

[0009] The moulding is strengthened by means of an auxiliary section member, made of aluminium for example, of smaller section than that of the supporting elements, placed between the cover and the supporting elements themselves and extending, like the cover, along the whole moulding.

[0010] A moulding of the last-mentioned type is much lighter-in-weight, because less material is used, but it involves a greater number of operations to be carried out on the extruded workpiece. In fact the section member bar is to be cut into a greater number of pieces and pierced with more holes.

[0011] The higher production cost due to an increase in the cutting and drilling operations completely takes up the reduction in cost due to the reduced amount of the material used.

[0012] The Applicant has found that the supporting elements of the above described type are susceptible of improvement under different points of view, particularly as regards simplicity of construction and practical way of mounting, as well as in terms of reduction in the production costs.

[0013] In particular it has been found that said supporting element can be manufactured through a simpler and cheaper process and with less expensive material, while keeping its functional character and strength unchanged and making its final installation easier.

[0014] Also the number of components of said modular structure can be reduced.

[0015] Accordingly, it is an object of the present invention to provide a supporting element of a modular structure for making mouldings along buildings' walls, comprising the features set out in the characterizing portion of claim 1.

[0016] It is a further object of the present invention to provide a modular structure for making mouldings along buildings' walls, comprising the features recited in the characterizing portion of claim 11.

[0017] It is a final object of the present invention to provide a process for obtaining a supporting element of a modular structure to make mouldings along buildings' walls, comprising the features recited in the characterising portion of claim 12.

[0018] Further features and advantages will become more apparent from the detailed description of a preferred, but not exclusive, embodiment of a supporting element of a modular structure for making mouldings along buildings' walls in accordance with the present invention. This description is taken hereinafter with reference to the accompanying drawings, given by way of non-limiting example, in which:

- Fig. 1 is an exploded perspective view of a moulding comprising supporting elements made in accordance with the present invention;
- Fig. 2 is an exploded perspective view of a supporting element in accordance with the invention, associated with an auxiliary section member;
- Fig. 3 is a perspective view of the supporting element of the invention from the side of its wall-fastening face;
- Fig. 4 is a perspective view of a cutting or blanking operation carried out on a metal sheet to make a supporting element in accordance with the invention;
- Fig. 5 is a perspective view showing a folding operation following blanking.

[0019] With reference to the drawings, a modular

structure to make mouldings along buildings' walls and comprising supporting elements 2 in accordance with the present invention has been generally identified by reference numeral 1.

[0020] Preferably the modular structure 1 is provided with two or more supporting elements 2 which are in alignment and spaced apart from each other along the moulding extension.

[0021] The modular structure 1 further comprises at least one covering element 3, preferably of plastic material, to be fitted on said supporting elements 2 for the purpose of absorbing shocks.

[0022] The covering element 3 extends between two or more suitably spaced apart supporting elements 2, and an auxiliary section member 4 may be interposed between the supporting element 2 and covering element 3, which auxiliary section member has the same length as the covering element 3, to give the moulding greater strength.

[0023] A bumper lining 5 is placed between the section member 4 and covering element 3, its function being that of partly absorbing shocks and avoiding noise due to direct impacts of the covering element on metal parts.

[0024] In addition, the modular structure 1, as shown in the figure, is provided with end elements 6 and angle bars 6a preferably of plastic material, provided with connecting inserts 7 to be fitted into the supporting element 2.

[0025] The end elements 6 are used to finish the moulding at the ends, whereas possible angle bars 6a are adapted to ensure continuity at the wall angles.

[0026] The supporting element 2 comprises at least one plate 8 adapted to be rigidly secured to the wall of a building (not shown) by a fastening face 8a thereof turned towards the wall itself.

[0027] For instance, fastening can be carried out by use of anchors 9 inserted in the wall and screws 10 tightened in anchors 9 after passing through appropriate slots formed in the first plate 8.

[0028] The supporting element 2 further comprises at least one second plate 12 rigidly secured to the first plate 8 and disposed in a direction substantially orthogonal to said first plate 8 on the opposite side with respect to the fastening face 8a.

[0029] Defined in the second plate 12 is a coupling housing 13 adapted to receive the connecting insert 7 of the end element 6 and/or angle bar 6a.

[0030] In the embodiment shown in the drawings, the coupling housing 13 is formed in the edge of the second plate 12 opposite to the one connected to the first plate 8 and substantially has the shape of an arc of a circle wider than 180°.

[0031] In an alternative embodiment not shown, said housing 13 is formed in the second plate 12 and substantially has a circular form.

[0032] Preferably, the supporting element 2 is provided with two second plates 12 that are shaped and disposed in a symmetrical manner and are parallel to a first symmetry axis Y of the first plate 8.

[0033] The coupling housings 13 of the two second plates 12 are aligned along a direction 14 substantially orthogonal to said first symmetry axis Y and coincident with the extension direction of the moulding on the wall.

[0034] The two aligned housings 13 are adapted to receive one connecting insert 7 alone to be engaged thereinto by axial sliding along the extension direction 14 of the moulding and of a length not much greater than the distance between said housings 13.

[0035] Advantageously, each second plate 12 comprises at least two coupling housings 13 symmetrically spaced apart with respect to a second symmetry axis Z exhibited by each of the second plates 12 in their own plane.

[0036] This configuration enables use of two parallel connecting inserts 7, each of them being susceptible of engagement in a pair of housings 13 aligned along the moulding extension direction 14.

[0037] The second plate 12 further comprises an engagement portion 15 for the supporting section member 4 following the moulding extension.

[0038] As better shown in Fig. 2, the section member 4 is a channel section with two teeth 16 placed along the opposite end edges of the section member 4 itself.

[0039] The engagement portion 15 is shaped on the edge of the second plate 12 opposite to that connected to the first plate 8 and defines two notches 17 extending perpendicular to and symmetrical with respect to the second symmetry axis Z.

[0040] Notches 17 are designed to receive the teeth 16 of the section member 4. To facilitate snap fitting of the section member 4, the second plate 12 has two edges 18 converging towards the second symmetry axis Z so as to define two slide seats helping in spreading apart the ends of the section member 4 when the latter is pushed towards the supporting element 2. In addition, for carrying out fastening of the covering element 3 on the supporting element 2, element 2 is provided with two fastening tailpieces 19 disposed at the ends 20 of the first plate 8 along the first symmetry axis Y. Each fastening tailpiece 19 may merely consist of a portion of plate 8 which is offset with respect to the plate face 8a in engagement with the wall, so as to leave a gap between the wall and the fastening tailpiece 19 itself.

[0041] The covering element 3 has a substantially channel-shaped section, with two end tailpieces 21 forming an undercut and set to engage themselves by snap fitting, after overriding the edges of the ends 20 of the first plate 8.

[0042] According to a preferred embodiment, either of the two fastening tailpieces 19 further comprises a lead-in portion 22 defining a surface converging towards a plane containing the second symmetry axes Z.

[0043] The lead-in portions 22 define two slide chutes facilitating spreading apart of the end tailpieces 21 of the covering element 3 during coupling, following the same fastening principle as the section member 4.

[0044] Still in accordance with the present invention, the above described supporting element 2 can be manufactured by a process comprising the following steps.

[0045] Cutting a metal sheet 23 along a closed line 24. The closed line 24 perimetrically confines a suitably shaped sheet portion 25.

[0046] In particular said sheet portion 25 has two mutually-opposite first edges 26, at least one of which is such shaped as to form one or more indentations 27 intended to define the coupling housings 13 for fitting of the connecting inserts 7.

[0047] Preferably during the cutting operation, slots 11 are formed in the sheet portion 25 by punching and in said slots screws 10 for wall-mounting of the supporting element 2 are engaged.

[0048] During the cutting operation, on one or both of the first edges 26 the engagement portion 15 for the section member 4 is also defined.

[0049] The sheet portion 25 is subsequently bent along a first bending line 28 substantially parallel to the first edge 26, to obtain the first plate 8 and the second plate 12 substantially perpendicular to the first plate 8.

[0050] In other words, the first bending line 28 delimits two plates 8, 12 in the sheet portion 25 which are substantially perpendicular to each other.

[0051] According to a preferred embodiment shown in the drawings, bending is carried out along two first bending lines 28 parallel to the first edges 26, which delimit second plates 12 respectively, that are perpendicular to the first plate 8 and substantially parallel to and facing each other.

[0052] Advantageously, the sheet portion 25 is further bent along at least two second bending lines 29, substantially parallel to two second opposite edges 30 of said sheet portion 25, so as to form the fastening tailpieces 19 for the covering element 3.

[0053] Preferably, the second bending lines 29 are four in number, two at each of the two second edges 30. Bending is carried out in opposite rotation ways around each of the two bending lines 29 respectively, that are associated with a single second edge 30, so as to offset the sheet part close to the second edge 30 with respect to the remaining sheet part defining the fastening face 8a.

[0054] Advantageously, the bending step can be executed by placing the sheet portion 25 on a suitably shaped die 31 and pressing said portion 25 against a counter-die 32.

[0055] Preferably, bending of the first edges 26 and second edges 30 is carried out separately with two die-counter-die pairs.

[0056] It is to be noted that the cutting operation involves formation of a plurality of burrs 33 (intentionally highlighted in Fig. 2) along the perimeter of the sheet portion 25, due to flowing of the material along the cutting lines on which the action of the punch-die system takes place.

[0057] The blanking burrs 33 therefore project in a transverse direction on one of the faces of each second plate 12, also at the edges of the coupling housings 13.

[0058] Advantageously the sheet portion 25 is such bent that burrs 33 are disposed on the mutually facing faces of the second plates 12.

[0059] In this way introduction of each connecting insert 7 into the first coupling housing 13 takes place on the opposite side from that of burrs 33, in such a manner that insert 7, on fitting, spreads burrs 33 apart and can slide, without particular difficulties, until reaching the second coupling housing 13 in alignment with the first one.

[0060] In other words, in the first part of its fitting stroke, insert 7 only slides in one of the two aligned housings 13, in the same way as the orientation of burrs 33.

[0061] On reaching the second housing 13, insert 7 is pushed thereinto through forcing of burrs 33 which extend in the opposite direction relative to the sliding one.

[0062] At the same time burrs 33 are such arranged that surely insert 7 is prevented from coming out once it has been fitted, because the metal burrs 33 spread apart on insertion, exert pressure against insert 7 and scratch the plastic-material surface thereof.

[0063] Therefore, movement of insert 7 in a direction opposite to the introduction direction is prevented by jamming of burrs 33 on the surface of the insert 7 itself.

[0064] Alternatively, cutting and bending of the sheet portion 25 are carried out in such a manner that burrs 33 project on the faces of the second plates 12 with a concordant orientation.

[0065] Preferably, burrs 33 project on the faces of the second plates 12 opposed to the introduction side of inserts 7, so that easy sliding in both the aligned housings 13 is ensured.

[0066] In this case too inserts 7 cannot come out of housings 13 once they have been positioned, because the orientation of the blanking burrs 33 hinders sliding of said inserts in the opposite direction relative to the introduction one.

[0067] To further facilitate mounting, the first coupling housing 13 into which insert 7 is introduced can be of greater size than the second one, or insert 7 may have a suitably tapering shape.

[0068] According to a preferred embodiment, in order to have an identification mark on the face of the sheet portion 25 on which there is the presence of burrs, for the purpose of avoiding the bending direction being wrong and for drawing attention to the orientation of the supporting element 2 if the piece is not made symmetrically, the process involves the further step of stamping one or more symbols 34 on at least one of the faces of said sheet portion 25, concurrently with the cutting and/or bending operations.

[0069] The present invention achieves important advantages.

[0070] It is to be noted that the supporting element in accordance with the invention is supplied to the installer

as a finished piece. The individual pieces are already pierced with holes and ready for fastening to the wall.

[0071] Advantageously, the presence of burrs that are usually removed in normal cutting processes, is herein positively utilized. In fact, as it appears from the description, the burrs oriented as shown enable easy insertion of the inserts in the housings and locking of same once they have been put in place, so that use of safety pegs is avoided.

[0072] In addition, to make locking still safer, the metal sheet surrounding the housings can be easily bent towards the inserts, once the latter are installed. This brings about a reduction in the mounting time and a simplification in the preparation operations.

[0073] Furthermore, use of plates for making the supporting element in accordance with the invention enables costs for the material to be greatly reduced as compared with the known art. In fact, a material less valuable than aluminium can be used, such as zinc-plated sheet steel, while keeping the element weight low and the element structure solid. Finally, the sheet blanking process in accordance with the invention is cheaper than aluminium extrusion and consequently in addition to a reduction in the material costs, also working costs are lower.

Claims

1. A supporting element of a modular structure for making mouldings along buildings' walls, comprising:

- a first plate (8) to be rigidly fastened to a wall of a building by a fastening face (8a) thereof turned towards the wall itself;
- at least one coupling housing (13) adapted to receive a connecting insert (7) of a modular-structure (1) end element (6) for making mouldings, which is associated with said first plate (8),

characterized in that it comprises at least one second plate (12) rigidly in engagement with the first plate (8); said second plate (12) being disposed on the face of the first plate (8) opposite to the fastening face (8a) and in a direction substantially perpendicular to said first plate (8); the coupling housing (13) being defined in said second plate (12).

2. A supporting element as claimed in claim 1, **characterized in that** said second plate (12) further has an engagement portion (15) for a section member (4).

3. A supporting element as claimed in claim 1, **characterized in that** it comprises at least two of said second plates (12) parallel to and facing each other.

4. A supporting element as claimed in claim 3, **characterized in that** the distance between the second plates (12) is smaller than the length of said connecting insert (7).

5. A supporting element as claimed in claim 3, **characterized in that** said second plates (12) are disposed symmetrically with respect to a first symmetry axis (Y) exhibited by the supporting element (2) in the plane of the first plate (8); the respective coupling housings (13) of said second plates (12) being aligned along a direction (14) substantially perpendicular to said first symmetry axis (Y).

6. A supporting element as claimed in claim 3, **characterized in that** each of the second plates (12) comprises at least two coupling housings (13) disposed symmetrically with respect to a second symmetry axis (Z) exhibited by the second plates (12) in their own plane; the respective coupling housings (13) of said second plates (12) being aligned along two directions (14) substantially perpendicular to a first symmetry axis (Y) exhibited by the supporting element (2) in the plane of the first plate (8).

7. A supporting element as claimed in claim 1, **characterized in that** it further comprises two tailpieces (19) for fastening of a covering element (3) placed at the respective ends (20) of the first plate (8) along a first symmetry axis (Y) exhibited by the supporting element (2) in the plane of the first plate (8).

8. A supporting element as claimed in claim 3, **characterized in that** it comprises a plurality of cutting or blanking burrs (33) disposed at least along the edges of the coupling housings (13) and jutting out on one of the faces of each of the second plates (12).

9. A supporting element as claimed in claim 8, **characterized in that** the blanking burrs (33) jut out on the mutually facing faces of the second plates (12).

10. A supporting element as claimed in claim 8, **characterized in that** the blanking burrs (33) jut out on the faces of the second plates (12) having a concordant orientation.

11. A modular structure for making mouldings along buildings' walls, comprising:

- at least two supporting elements (2);
- at least one covering element (3) for engage-

ment on said supporting elements (2);

- at least one section member (4) for engagement on said supporting elements (2), between the supporting elements (2) and the covering element (3);
- end elements (6) to be connected each with one of said supporting elements (2), by insertion of at least one first connecting insert (7) carried by the end element (6) itself into the supporting element (2);

characterized in that each supporting element (2) is made in accordance with one or more of the preceding claims.

12. A process for obtaining a supporting element of a modular structure for making mouldings along buildings' walls, **characterized in that** it comprises the following steps:

- cutting a metal sheet (23) along a closed line (24) perimetrically confining a sheet portion (25); said sheet portion (25) having two mutually-opposite first edges (26) and two mutually-opposite second edges (30); at least one of said first edges (26) having at least one indentation (27);
- bending the sheet portion (25) along at least one first bending line (28) substantially parallel to the first edge (26) provided with the indentation (27); said first bending line (28) delimiting in the sheet portion (25), a first plate (8) and a second plate (12) substantially perpendicular to the first plate (8); the indentation (27) defining a coupling housing (13) adapted to receive a connecting insert (7) of a modular-structure (1) end element (6) for making mouldings.

13. A process as claimed in claim 12, **characterized in that** during the cutting step an engagement portion (15) for a section member (4) is defined on the first edge (26) provided with the indentation (27).

14. A process as claimed in claim 12, **characterized in that** the step of bending the sheet portion (25) is carried out at least along two first bending lines (28) which are substantially parallel to the first edges (26), to delimit in the sheet portion (25), two of said second plates (12) facing each other.

15. A process as claimed in claim 12, **characterized in that** in the step of bending the sheet portion (25) a fastening tailpiece (19) for a covering element (3) is formed on each of the second edges (30).

16. A process as claimed in claim 12, **characterized in that** the step of bending the sheet portion (25) is carried out by placing the sheet portion (25) on a die (31) and pressing said sheet portion (25) with a counter-die (32).

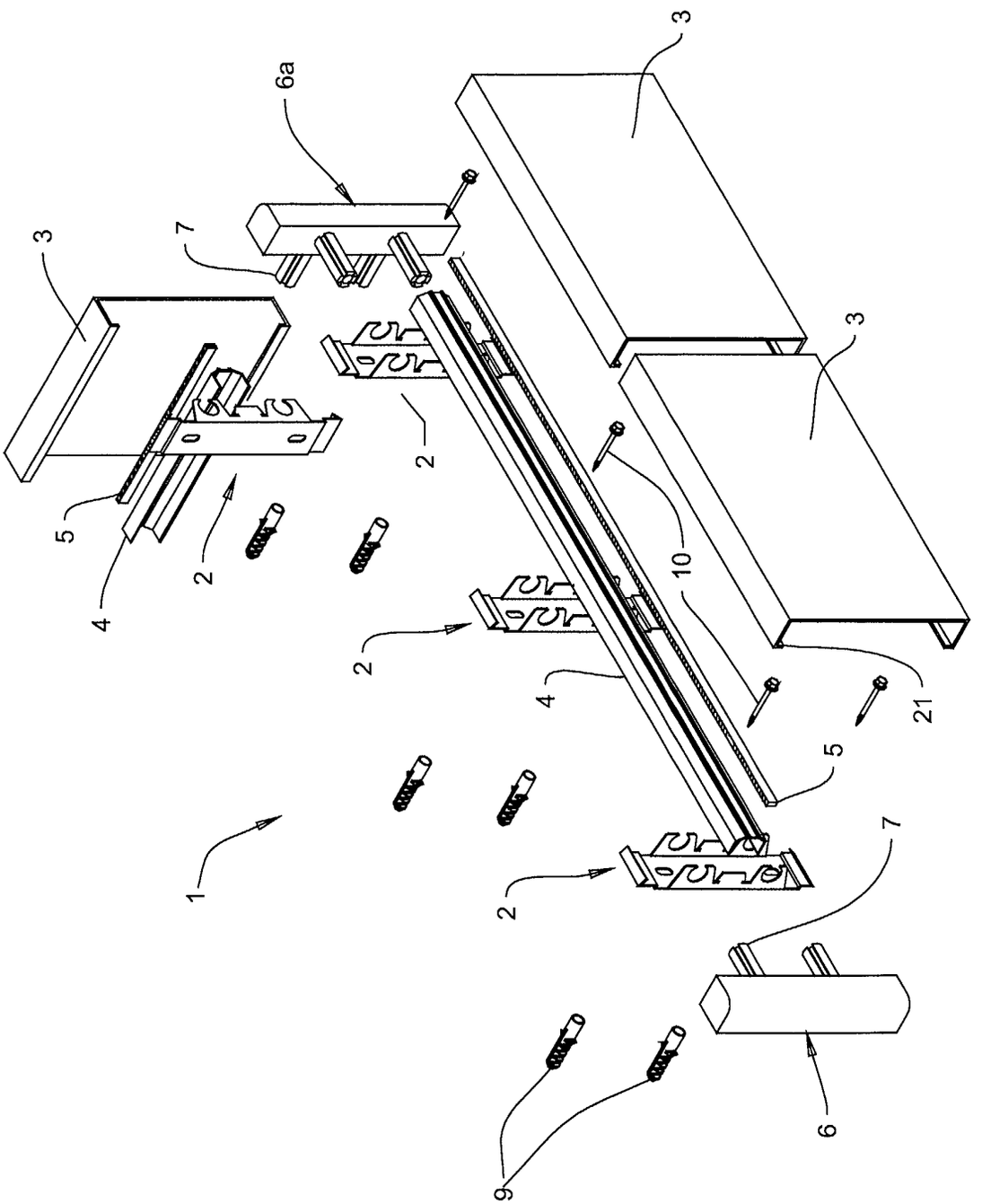

FIG.1

FIG.2

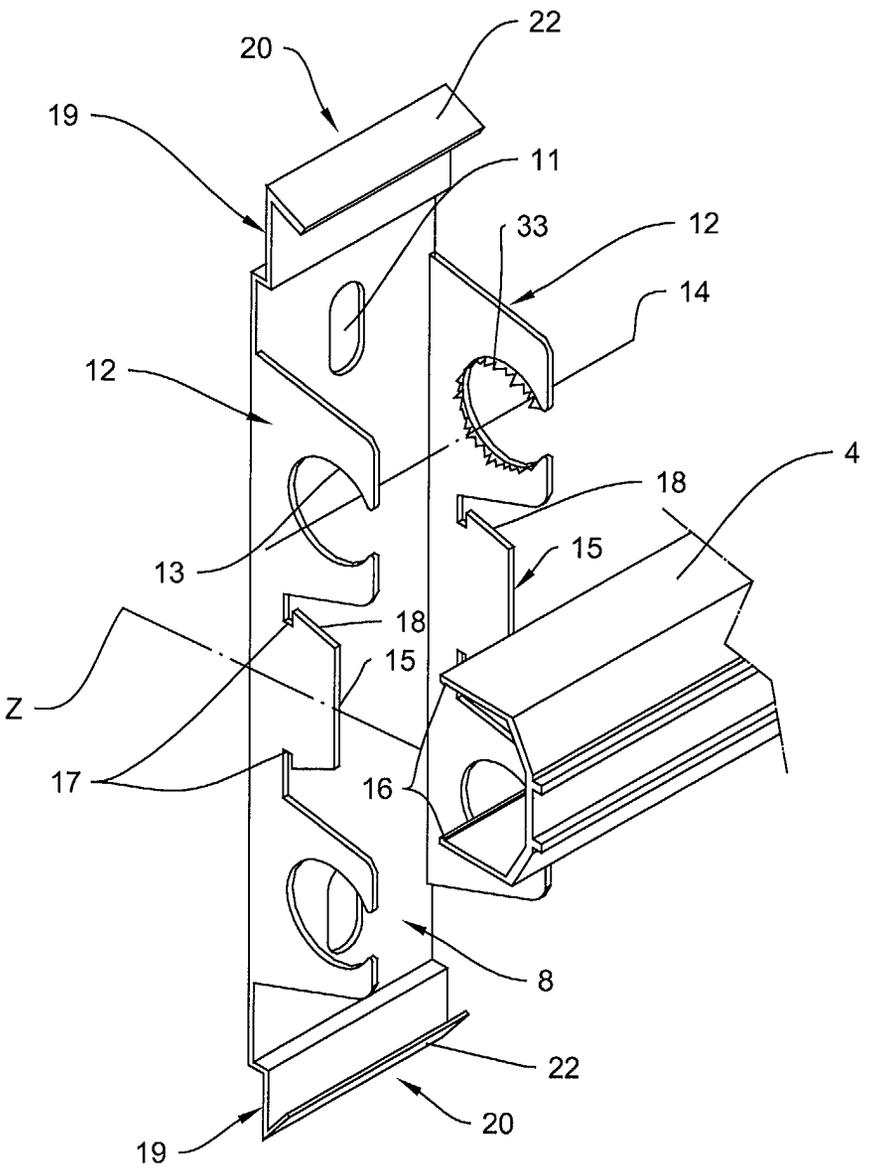

FIG.5

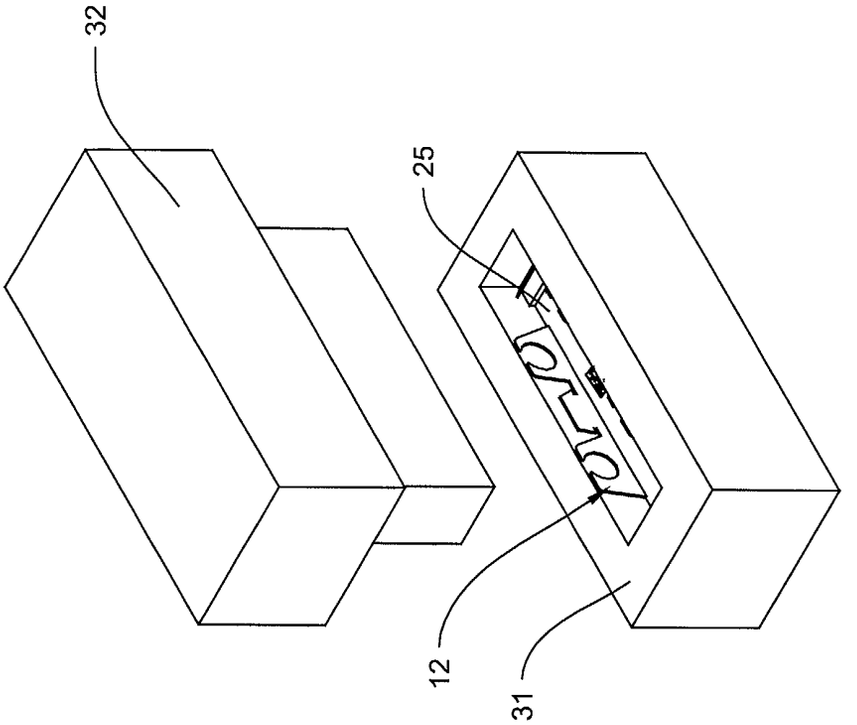

FIG.3

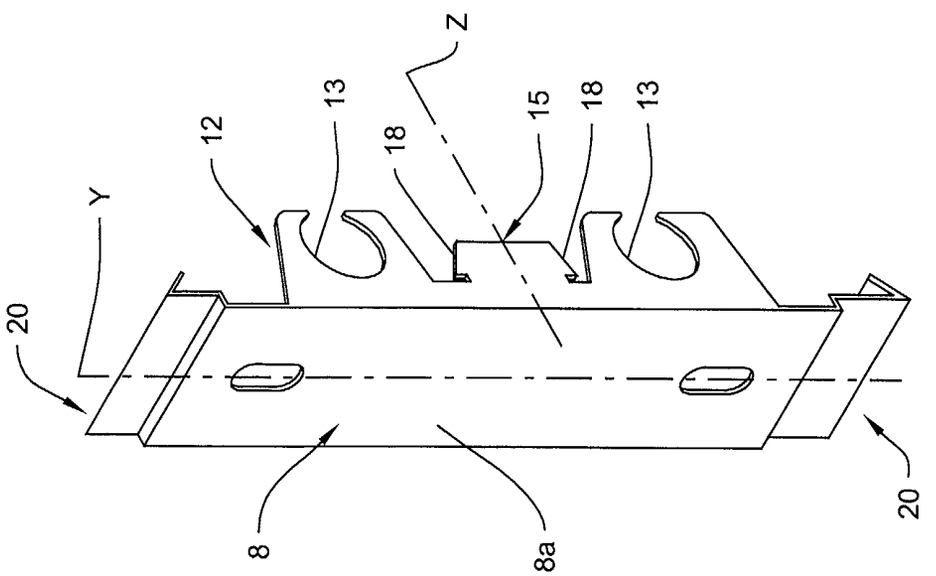

FIG.4