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(54) ASSEMBLY AND METHOD FOR FORMING A LAMP INCORPORATED IN A PLASTERBOARD WALL OR IN A WALL TO BE CLAD

(57) The invention relates to an assembly for making a lamp incorporated in a plasterboard wall (2) or in a wall (3) made of fiber-cement sheets or in a wall (4) composed of materials for on-site construction to be clad. The assembly comprises a lamp body (10) that houses a light source (12) and a formwork (20) defining a rebated front wall (22) suitable to be fixed to the inner side of a plasterboard panel (2'), a fiber-cement sheet (3') or wall cladding (4'), a light-emitting cavity (24) forming a housing seat (26) at the rear for the lamp body (10) and a light-emitting opening (28) at the front in the front wall (22). The light-emitting opening (28) being delimited at the bottom by an inclined surface (32) towards which the light generated by the light source (12) is projected and which ends at the light-emitting opening (28). The formwork (20) is also equipped with retaining means (34) cooperating with said inclined surface (32) to hold a cladding sheet (5) of the inclined surface.

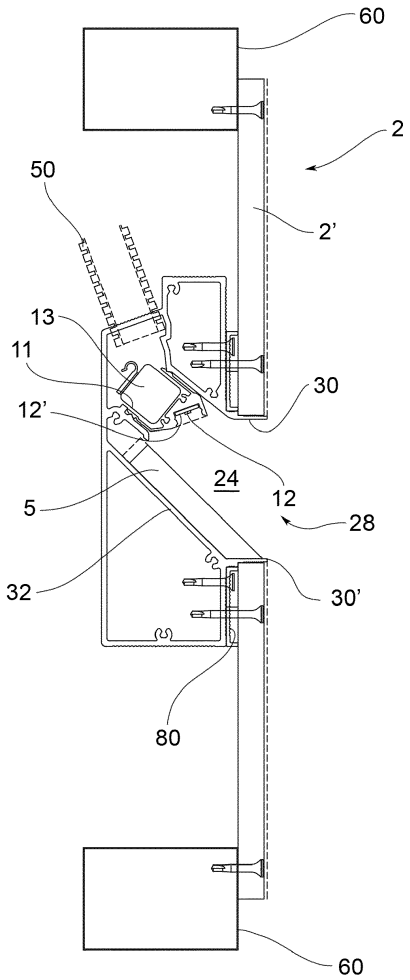

FIG.6

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Description

[0001] The present invention relates to a formwork and to a method for forming a lamp incorporated in a plasterboard wall or in a wall made of fiber-cement sheets or in a wall made of materials for on-site construction to be clad, for example made of hollow bricks or concrete.

[0002] In a previous patent application by the same applicant, an assembly and a method for forming a lamp incorporated in a masonry wall, in particular in a reinforced concrete wall, were described.

[0003] An assembly and a method for forming a substantially parallelepiped-shaped single-piece panel in which a lamp body is completely embedded and which can be inserted and fixed between bricks, blocks or panels that form the wall or a cladding of the wall, in particular the panels of external insulation have been described in another previous patent application by the same applicant.

[0004] Conversely, it has not yet been proposed how to form a lamp incorporated in a plasterboard wall or in a wall made of fiber-cement sheets in order to obtain the same excellent functional, structural and aesthetic effects achieved by means of the teachings described in the patent applications cited.

[0005] One object of the present invention is therefore to bridge such a gap by proposing an assembly and a method that can allow for the installation of a lamp in a plasterboard wall or in a wall made of fiber-cement sheets.

[0006] Another object of the invention is to propose an assembly and a method that can advantageously also be used to install a lamp in a wall made of materials for on-site construction to be clad, for example in hollow bricks or reinforced concrete.

[0007] Another object of the invention is to propose an assembly and a method that also make it possible for a non-specialized operator, for example the same plasterboard installer or bricklayer, to incorporate a lamp in a plasterboard wall or in a wall made of fiber-cement sheets or in a wall made of materials for on-site construction to be clad in a manner that is quick, safe and at the same time very precise.

[0008] Said objects are achieved by an assembly according to claim 1, by a method according to claim 9 and by a method according to claim 10. The dependent claims describe preferred embodiments of the invention.

[0009] The features and the advantages of the assembly and of the method according to the invention will, however, become clear from the following description of preferred embodiments, given by way of non-limiting example, with reference to the attached drawings, in which:

- Fig. 1 is a perspective exploded view of the assembly according to the invention in one embodiment, and which shows the relative extruded profile of the lamp body without the light source;
- Fig. 2 is a perspective exploded view from behind of the single formwork;
- Fig. 3 and 3a are two perspective views, one front view and one rear view, of the assembled formwork, in which the section lines indicate that the formwork, if formed by an extruded profile, can have any desired length in the longitudinal direction (that is horizontal when the formwork is placed on-site);
- Fig. 4 and 4a are two perspective views, one front view and one rear view, of the assembled lamp body provided with a light source, in which the section lines indicate that the lamp body, if formed having an extruded profile, can have any desired length in the longitudinal direction (that is horizontal when the lamp body is placed on-site);
- Fig. 5 is a cross section of the extruded profile that forms the formwork in one embodiment;
- Fig. 6 is a sectional view of the assembly according to the invention affixed to a plasterboard wall for indoor use;
- Fig. 7 is a sectional view of the assembly according to the invention affixed to a wall made of fiber-cement sheets for outdoor use;
- Fig. 8 is a perspective view of the formwork and of a plasterboard panel or a panel made of fiber-cement sheets before they are fastened;
- Fig. 9 is a perspective view of three examples of different cladding sheets that can be used to clad the inclined surface of the light-emitting cavity of the formwork;
- Fig. 10 is a front view of the assembly affixed to the plasterboard wall or wall made of a fiber-cement sheet, with the panel or sheet transparent in order to show the position of the lamp body housed in the formwork; and
- Fig. 11 is a sectional view of the assembly according to the invention affixed to a wall made of materials for on-site construction to be clad.

[0010] In the following description, elements that the different embodiments have in common or that are equivalent are indicated by the same reference numerals.

[0011] In addition, unless stated otherwise, features described with reference to one embodiment can also be used in other embodiments.

[0012] In said drawings, 1 indicates, as a whole, an assembly for forming a lamp incorporated in a plasterboard wall 2 or in a wall 3 made of fiber-cement sheets or in a wall 4 made of materials for on-site construction to be clad.

[0013] The assembly 1 comprises a lamp body 10 and a formwork 20.

[0014] The lamp body 10 houses a light source 12.

[0015] The formwork 20 defines a rebated front wall 22 suitable to be attached to the inner side of a plasterboard panel 2' or a panel 3' made of fiber-cement sheets or cladding 4' of the wall 4 to be clad.

[0016] The formwork 20 also defines a light-emitting cavity 24 that forms a seat 26 at the back for housing the

lamp body 10 and a light-emitting opening 28 at the front in the front wall 22.

[0017] The light-emitting opening 24 is delimited by a peripheral frame 30 that extends perpendicularly from the front of the front wall 22 and such that the front edge 30' of the peripheral frame 30 is flush with the outer side of the plasterboard panel 2' or the fiber-cement sheet 3' or of the cladding 4' of the wall, as shown in Fig. 6, 7 and 11.

[0018] The light-emitting cavity 24 is delimited at the bottom by an inclined surface 32 towards which the light generated by the light source 12 is projected and which ends in the light-emitting opening 28.

[0019] In other words, in a preferred embodiment, the lamp body 10, when positioned in its housing seat 26, is not only arranged in a withdrawn position with respect to the light-emitting opening 28, but also in a raised position such that an observer stood in front of the wall 2, 3, 4, is not blinded by the direct light of the light source 12 (Fig. 10).

[0020] The formwork 20 is also provided with retaining means 34 that cooperate with the inclined surface 32 in order to hold a cladding sheet 5 of the inclined surface 32.

[0021] This cladding sheet 5 can be made from the same material as the wall (plasterboard, fiber-cement, cladding), and can therefore be obtained and installed by the same plasterboard installer or bricklayer, or from a different material. For example, the cladding sheet 5 can be made of anodized aluminum and can be supplied together with the formwork 20.

[0022] Fig. 9 shows a few examples of cladding sheet 5a, 5b, 5c that can not only differ in terms of materials but also shape. For example, the cladding sheet 5b has a concave upper side rather than a flat one.

[0023] In one embodiment, the formwork 20 is formed as one piece having an extruded profile 21. In this case, the assembly 1 can comprise two side caps 40 suitable to close the open ends of the extruded profile 21 so as to form the lateral sides of the light-emitting cavity 24.

[0024] In some embodiments, the formwork formed as an extruded profile 21 can have a longitudinal extension that is much greater than its vertical dimension, or a plurality of formworks can be brought together without side caps so as to form a continuous linear lamp. In this case, the side caps 40 would not be necessary either.

[0025] It should be noted that, in one embodiment shown in Fig. 1, 3 and 5, the formwork 20 is provided with a wall 41 at the front for closing the light-emitting opening 28. This closing wall 41 can easily be moved by the peripheral frame 30 once the formwork 20 is placed on-site, for example on account of the reduced thickness of its edge that connects to the peripheral frame 30. The closing wall 41 protects the light-emitting cavity 24 during the steps of installing the formwork 20 and stiffens the structure itself of the formwork 20. In particular, when the formwork 20 is placed on-site, the closing wall 41 prevents the weight that can bear down thereon from tending to squash the light-emitting cavity 24, which would thus impede the subsequent insertion of the lamp body 10.

[0026] In one embodiment, the light source 12 comprises one or more LED light source cables mounted on a printed circuit board 12'.

[0027] In one embodiment, the lamp body 10 comprises, in addition to the light source, electrical and/or electronic circuits for controlling the light source. The lamp body 10 is also intended for receiving a power supply 13 and an electrical connector for electrically connecting to power supply and/or control cables.

[0028] The lamp body 10 may also comprise optical elements for controlling the light beam generated by the light source 12.

[0029] In one embodiment, the lamp body 10 is also provided with heat dissipation means for the heat generated by the light source.

[0030] In one embodiment, the lamp body 10 and the light-emitting cavity 24 are dimensioned so as to allow the lamp body 10 to be inserted into the housing seat 26 through the light-emitting opening 28 and the light-emitting cavity 24.

[0031] In one embodiment, the lamp body 10 is insertable into its housing seat 26 by a snap fit. For example, the walls of the formwork 20 that delimit the housing seat 26 form undercuts 26' that engage with corresponding resilient tabs 11 made in the lamp body 10.

[0032] In one embodiment, the extruded profile 21 forms, in the rear portion of the light-emitting cavity 24, a longitudinal retaining wall 42 that extends from a rear wall 44, substantially in parallel with the inclined surface 32, and has an upper side shaped suitable for snap engaging with the lamp body 10 and an end tooth 44' that can interact with the cladding sheet 5 of the inclined pane.

[0033] In one embodiment, the cladding sheet 5 of the inclined surface 32 is provided with fastening means 5', for example a fastening tooth, which cooperate with the retaining means 34 and also comprise a hole, for example, in which the fastening tooth can engage so that said cladding sheet is fastened to the inclined surface 32.

[0034] It should be noted that, in order to create, as far as possible, surface continuity between the outer side of the panel 2, sheet 3 or cladding 4 and the cladding sheet 5 of the inclined surface 32, the cladding sheet 5 has a lower end that is counter-shaped to the lower side of the peripheral frame 30. In particular, this lower end is cut so as to form a horizontal support base that rests against the horizontal lower side of the peripheral frame 30.

[0035] In one embodiment, a rear opening 46 is made in a rear wall of the formwork 20, which delimits the housing seat 26 of the lamp body 10, suitable for the passage of the end of a corrugated tube 50 that can carry the electrical power supply/control cables for the lamp body 10.

[0036] The installation of the assembly 1 in a plasterboard wall 2 or in a wall 3 made of fiber-cement sheets is carried out as follows.

[0037] A window 2a; 3a is made in a plasterboard panel 2' or in a fiber-cement sheet 3', which has dimensions

that correspond to the light-emitting opening 28.

[0038] The electrical power supply/control cables of the lamp are brought in the proximity of the region where the lamp is positioned.

[0039] The formwork 20 is fixed to the inside of the panel or sheet so as to pass the peripheral frame 30 through the window 2a; 3a.

[0040] For example, the formwork 20 is fixed by means of screws and/or glue applied to the front wall 22 of the formwork 20.

[0041] At this point, the panel or sheet is fixed to the bars 60 of the frame of the plasterboard or fiber-cement wall.

[0042] It is therefore possible to proceed with positioning a cladding sheet 5 on the inclined surface 32.

[0043] The electrical cables are connected to the lamp 10.

[0044] The lamp body 10 is fastened to its housing seat 26.

[0045] When the lamp is installed in a wall made of materials for on-site construction, the method is carried out as follows.

[0046] The electrical power supply/control cables of the lamp are brought in the proximity of the region where the lamp is positioned.

[0047] A recess 70 is made in the wall that is suitable to house the formwork 20 and the electrical cables are therefore pulled inside this recess 70.

[0048] The formwork 20 is inserted into the recess 70 so that the peripheral frame 30 protrudes with respect to the outside of the wall that is not clad such that the front edge 30' of the peripheral frame 30 will be flush with the outer side of the cladding once it has been glued to the wall.

[0049] After having locked the formwork 20 in position in the recess 70, a layer of cladding adhesive 72 is applied to the wall to be clad and to the front wall 22 of the formwork such that said walls are coplanar.

[0050] At this point, the cladding can be applied to the wall and a cladding sheet 5 can be positioned on the inclined surface 32.

[0051] The electrical cables are therefore connected to the lamp body and the lamp body is attached to its housing seat.

[0052] It should be noted that, in order to use said formwork 20 with panels, sheets or cladding having different thicknesses, a spacer 80, for example in the form of an extruded profile screwed to the front wall 22, can be arranged between the front wall 22 of the formwork and the inner side of the panel, sheet or cladding.

[0053] An expert in the field may modify and adapt the embodiments of the assembly and the method according to the invention and substitute elements with other functionally equivalent elements in order to meet contingent needs, without departing from the scope of the following claims. All of the features described as belonging to a possible embodiment can be formed independently of the other embodiments described.

Claims

1. Assembly for making a lamp incorporated in a plasterboard wall or in a wall made of fiber-cement sheets or in a wall composed of materials for on-site construction to be clad, comprising:

   - a lamp body that houses a light source;
   - a formwork defining a rebated front wall suitable to be attached to the inner side of a plasterboard panel, a fiber-cement sheet or wall cladding, at the rear a light-emitting cavity forming a housing seat for the lamp body and in front a light-emitting opening in the front wall, said light-emitting opening being delimited by a peripheral frame extending frontally and perpendicularly from the front wall in such a way that the front edge of said peripheral frame is flush with the outer side of the panel, sheet or wall cladding, the light-emitting cavity being delimited below by an inclined plane towards which the light generated by the light source is projected and which ends at the light-emitting opening, the formwork being further equipped with retaining means cooperating with said inclined plane to retain a cladding sheet of the inclined plane.

2. Assembly according to claim 1, wherein the formwork is made in one piece with an extruded profile, the assembly comprising two side caps suitable to close the open ends of the extruded profile so as to form the lateral sides of the light-emitting cavity.

3. Assembly according to claim 1 or 2, wherein the lamp body may be snapped into the housing seat.

4. Assembly according to claims 2 and 3, wherein the extruded profile forms, in the rear portion of the light-emitting cavity, a longitudinal retaining wall that extends from a rear wall substantially parallel to the inclined plane and which has a shaped upper side for snap engaging the lamp body and an end tooth suitable to interact with the cladding sheet of the inclined plane.

5. Assembly according to any one of the preceding claims, comprising a cladding sheet of the inclined plane, e.g. made of anodized aluminum, equipped with fastening means cooperating with the retaining means so as to be fastened to the inclined plane.

6. Assembly according to the preceding claim, wherein the cladding sheet has a lower end counter-shaped to the lower side of the peripheral frame.

7. Assembly according to any one of the preceding claims, wherein, in a rear wall of the formwork delimiting the housing seat of the lamp body, a rear

opening is made for the passage of the end of a corrugated tube suitable for carrying electrical cables for power supply/control of the lamp body.

8. Assembly according to any one of the preceding claims, wherein the lamp body comprises electrical and/or electronic circuits for controlling the light sources, an electrical connector, and a power supply.

9. Method for incorporating a lamp into a plasterboard wall or a fiber-cement sheet wall, comprising the steps of:

- providing an assembly according to any one of the preceding claims;
- obtaining a window of a size corresponding to the light-emitting opening in a plasterboard panel or fiber-cement sheet;
- bringing the power supply/control cables of the lamp in the proximity of the area where the lamp is positioned;
- fixing the formwork to the inside of the panel or sheet so that the peripheral frame is inserted into the window, for example, using screws and/or glue applied to the front wall of the formwork;
- fixing the panel or sheet to the frame bars of the plasterboard or fiber-cement wall;
- positioning a cladding sheet on the inclined plane, the cladding sheet having a lower end counter-shaped to the lower side of the peripheral frame;
- connecting the electrical cables to the lamp body;
- attaching the lamp body to the housing seat thereof.

10. Method for incorporating a lamp in a wall composed of materials for on-site construction, comprising the steps of:

- providing an assembly according to any one of the preceding claims;
- bringing the power supply/control cables of the lamp in the proximity of the area where the lamp is positioned;
- obtaining in the wall a recess that is suitable to house the formwork and to pull the electrical cables inside said recess;
- inserting the formwork into the recess by making the peripheral frame protrude from the outside of the wall without cladding, so that the front edge of the peripheral frame will be flush with the outer side of the cladding once it is adhered to the wall;
- applying a layer of cladding adhesive to the wall to be clad and to the front wall of the formwork so that said walls are coplanar;
- applying the cladding to the wall;
- positioning a cladding sheet on the inclined plane, the cladding sheet having a lower end counter-shaped to the lower side of the peripheral frame;
- connecting the electrical cables to the lamp body;
- attaching the lamp body to the housing seat thereof.

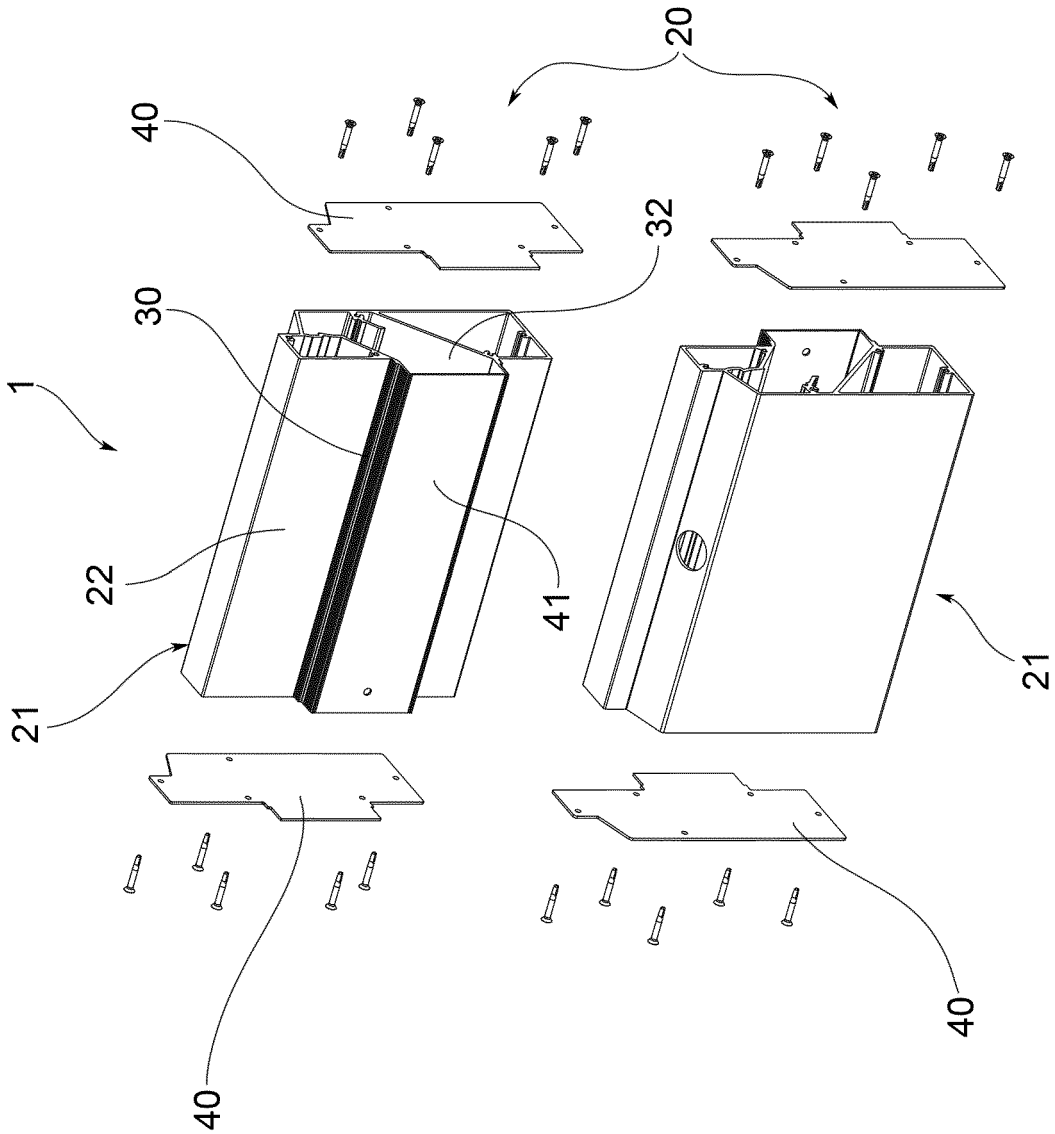

FIG.2

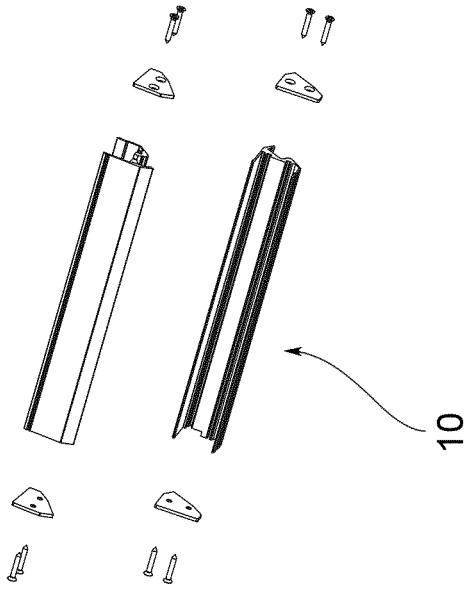

FIG.1

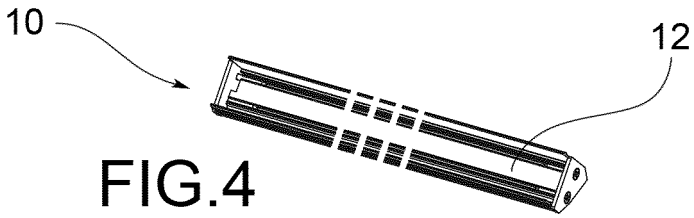

FIG.4

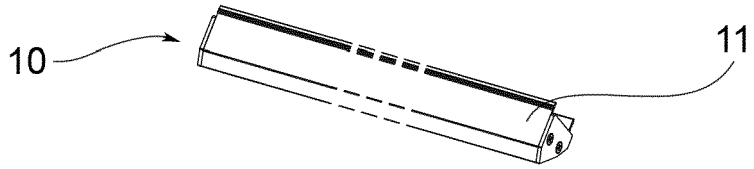

FIG.4a

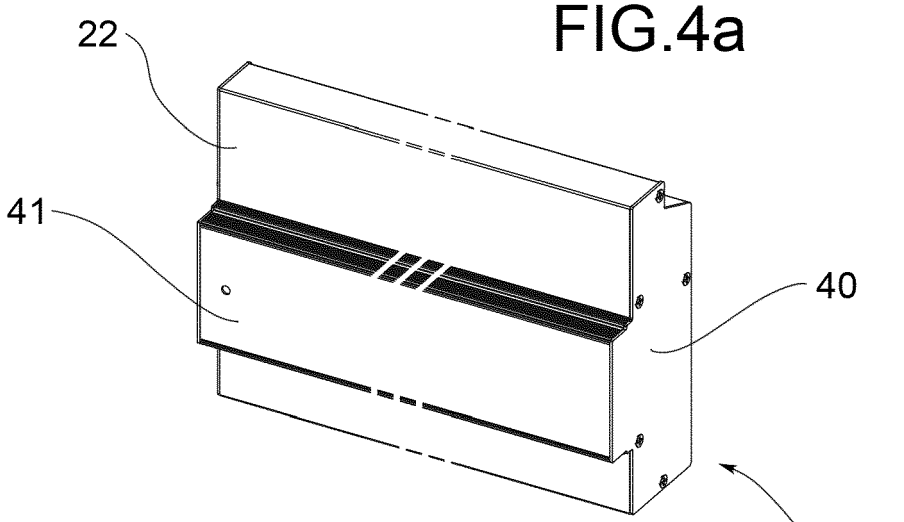

FIG.3

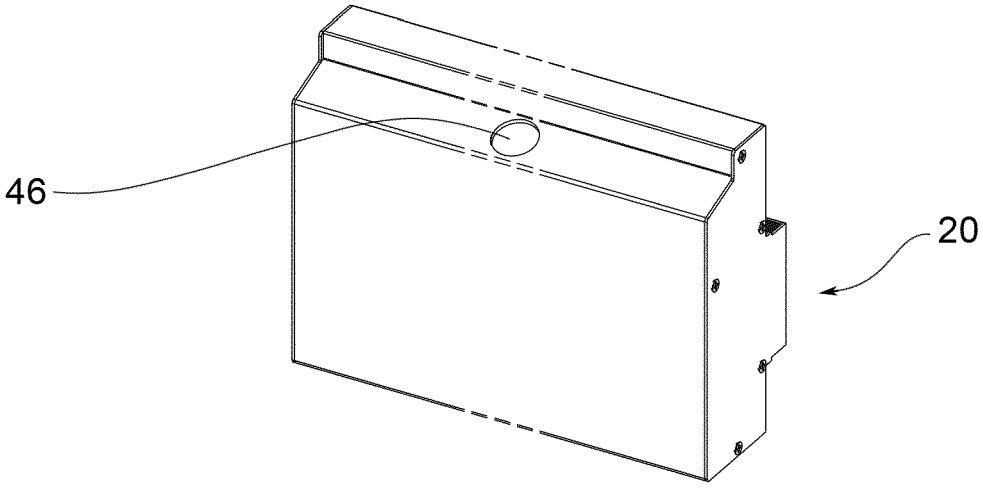

FIG.3a

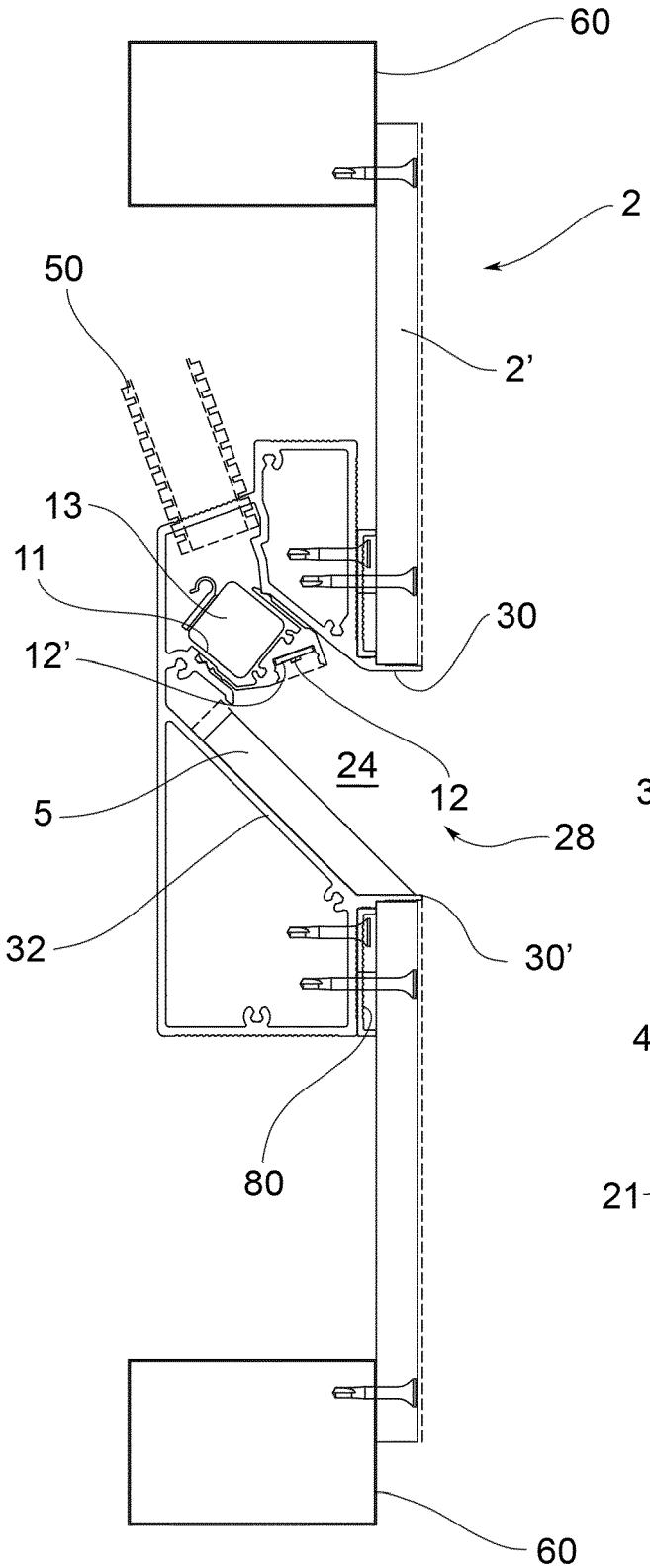
60
2
50
2'
13
11
12'
30
24
5
12
28
32
30'
80
60

FIG.6

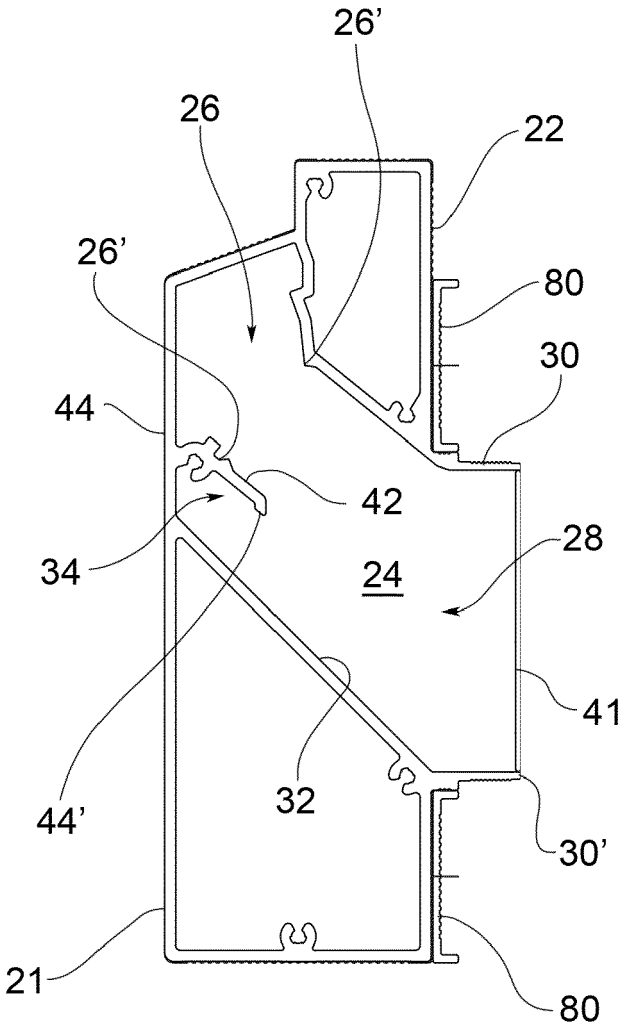
26'
26
22
26'
80
30
44
42
34
28
24
41
32
44'
30'
21
80

FIG.5

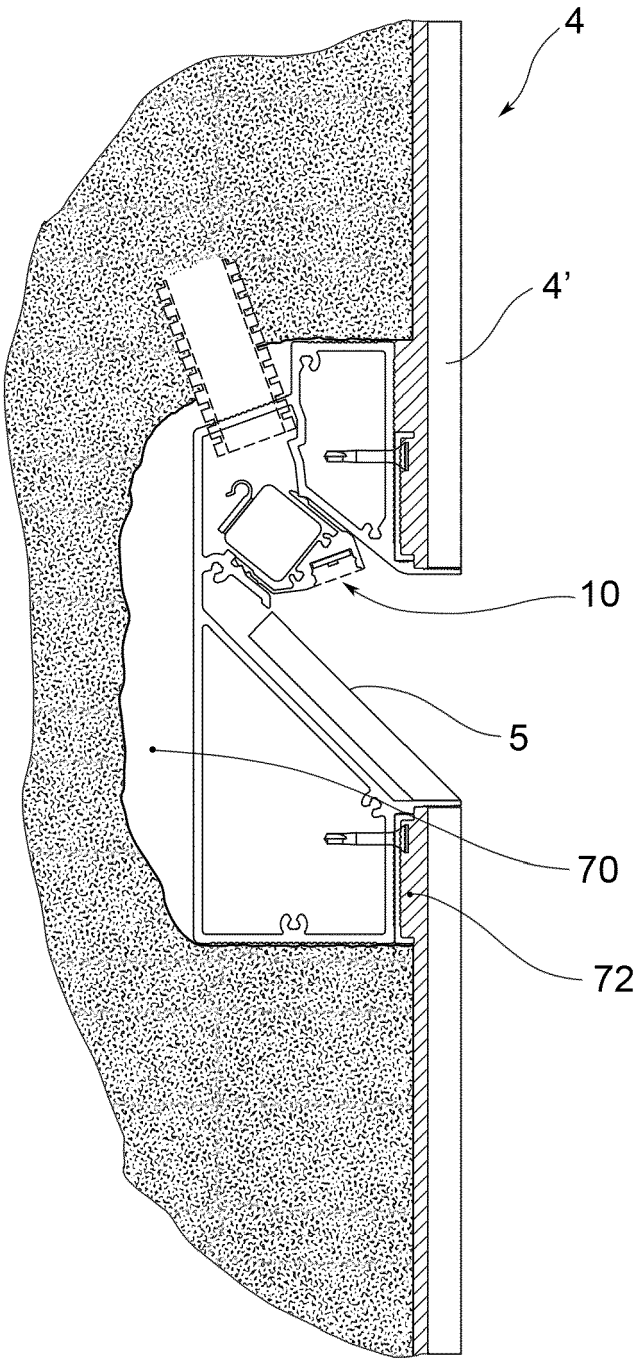

FIG.11

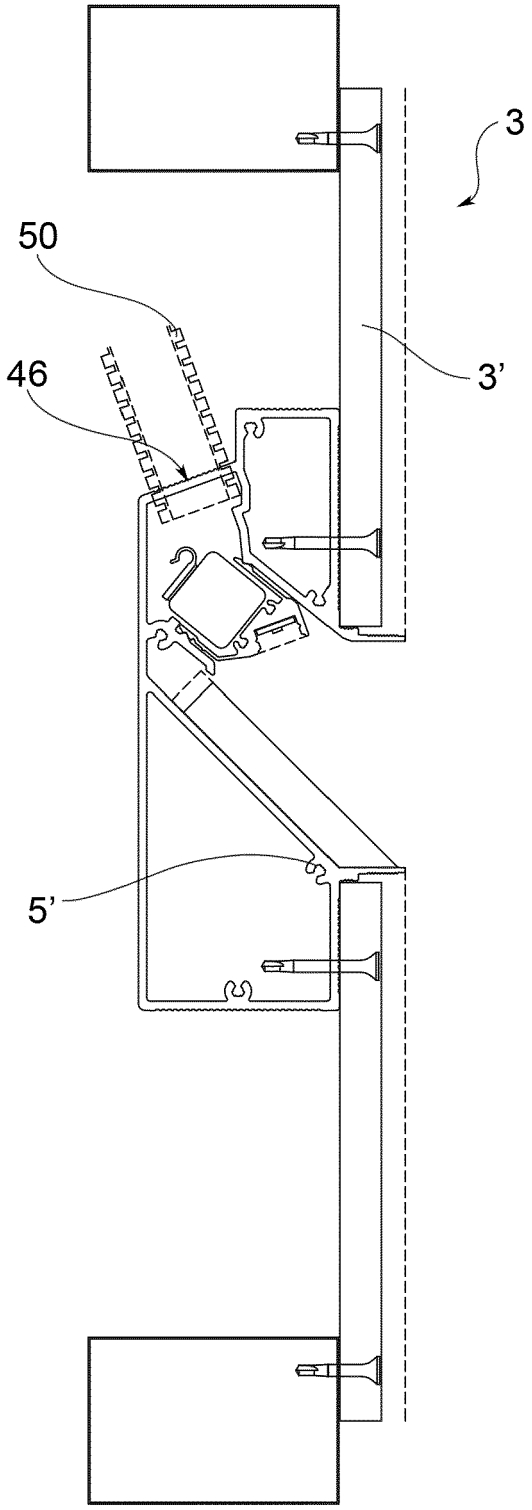

FIG.7

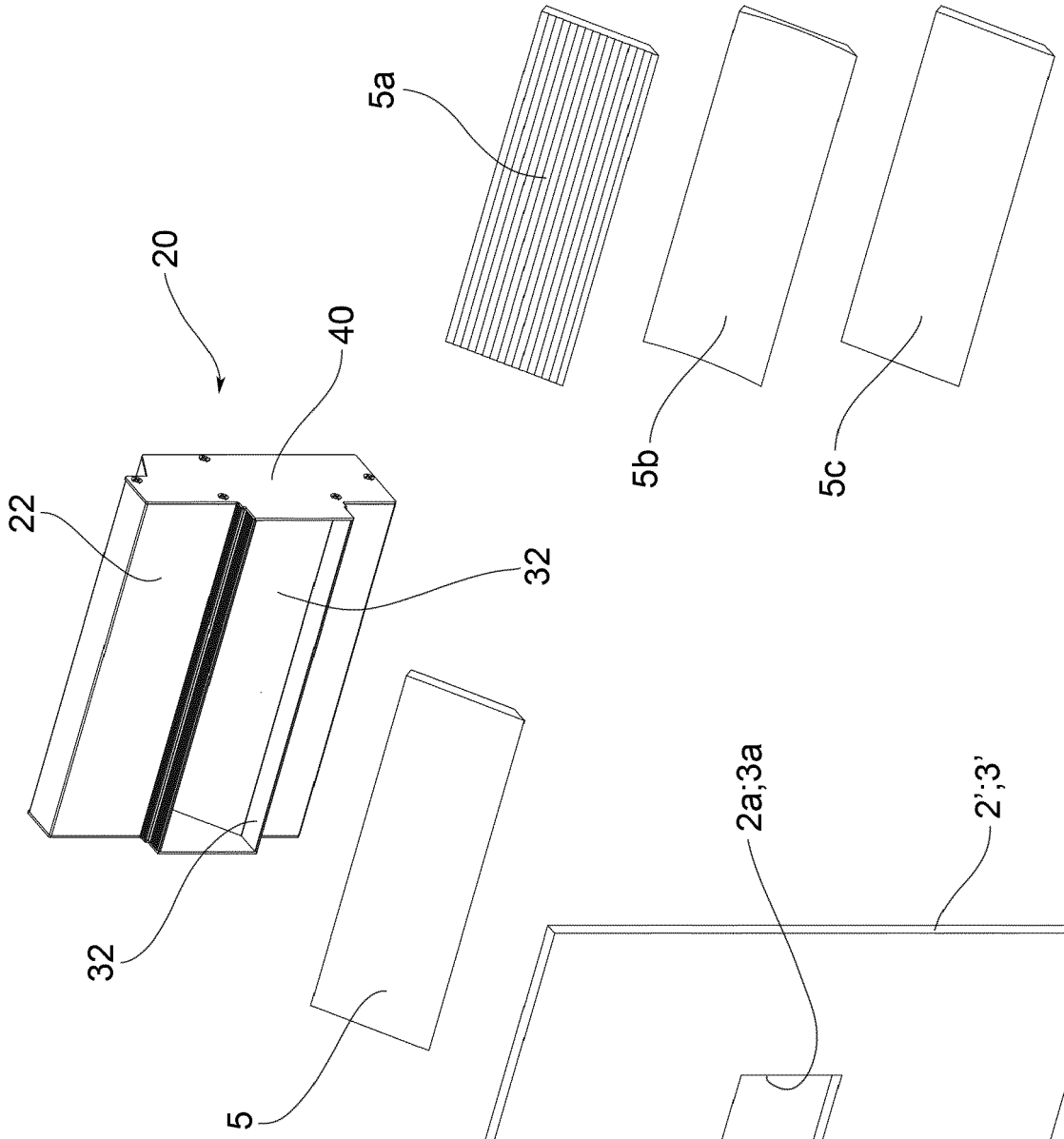

FIG.9

FIG.8

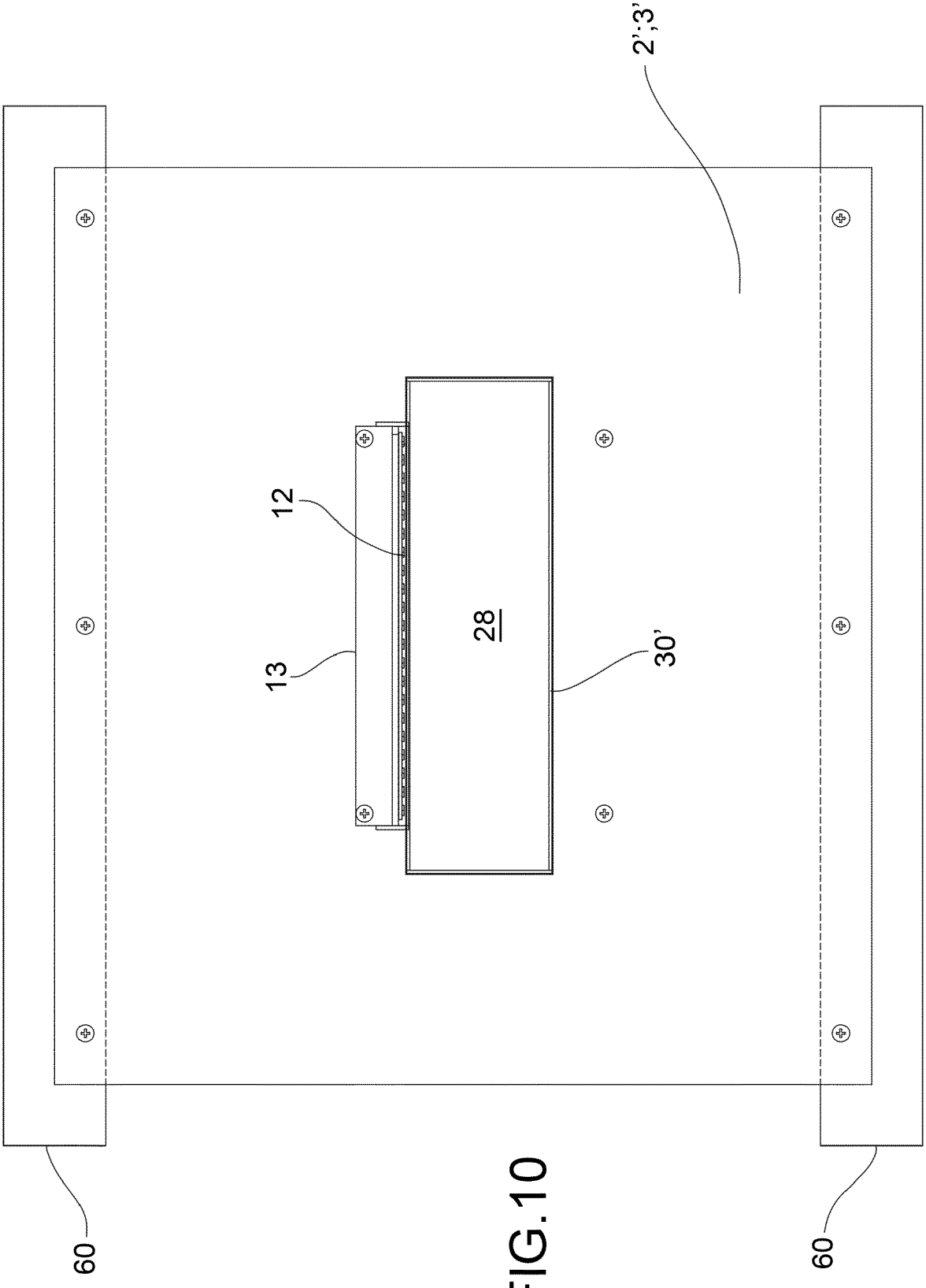

FIG.10

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EUROPEAN SEARCH REPORT

Application Number
EP 20 16 5580

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2018/238534 A1 (BIANCHI NEREO [IT]) 23 August 2018 (2018-08-23) * figures 1,2,4,7,9 *	1-3,5-10	INV. F21S8/02 F21S4/28 F21V7/05 F21V7/10 F21V21/04 F21V15/01 ADD. F21Y115/10 F21Y103/10
X	WO 2011/151272 A1 (GUNST STEPHAN [BE]; SINNAEVE FRANK [BE]; FLEURBAEY JOHAN [BE]) 8 December 2011 (2011-12-08) * figures 4a,4b,5b *	1-3,5-10	
X	EP 2 375 151 A2 (HIERZER ANDREAS [AT]) 12 October 2011 (2011-10-12) * figure 3 *	1-3,5-7	
A	EP 3 374 694 A1 (SIMES [IT]) 19 September 2018 (2018-09-19) * figures 4a, 7,10a *	1-10	
A	US 2015/226401 A1 (FERRIER DAVID JAMES [US]) 13 August 2015 (2015-08-13) * figures 1a,1b,2,3 * * paragraphs [0025], [0026], [0029], [0036], [0040], [0041] *	1-10	TECHNICAL FIELDS SEARCHED (IPC) F21S F21V

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	5 June 2020	Dinkla, Remko

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 16 5580

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05-06-2020

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