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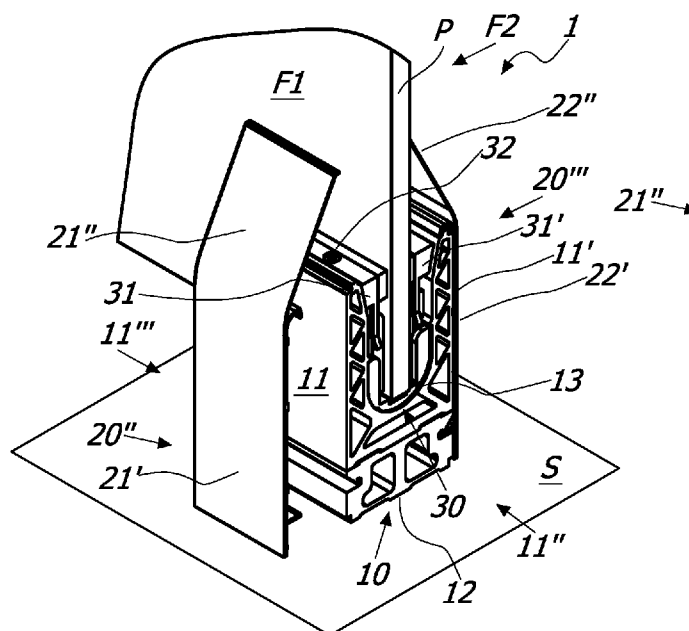


FIG. 1

(57) Abstract: A fixing structure for fixing a panel (P), such as a glass panel, which is susceptible to lay over a support surface (S), such as a balcony, a platform, a floor or the like. The fixing structure is in the form of a clamp or a longitudinal rail comprising at least one base element (10) and at least one couple of cover members (20, 20'). The at least one base element (10) includes a lower surface (12) susceptible to come in reciprocal contact with the support surface (S), a cradle (13) susceptible to seat the panel and two opposite side surfaces (11, 11') substantially perpendicular to the lower surface (12) susceptible to remain at opposite sides with respect to the panel (P) once inserted into the cradle (13). Each cover member (20, 20') is susceptible to cover a respective side surface (11, 11'). Means (30) may be provided for fixing the panel (P) within the cradle (13). The cover members (20, 20') and the base element (10) includes means (15, 16; 25, 26) for the reciprocal removable coupling to each other.

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FIXING STRUCTURE FOR FIXING A PANEL, IN PARTICULAR A GLASS PANEL**DESCRIPTION**Field of the invention

The present invention is generally applicable to the field of glass architecture, and it particularly relates to a fixing structure for fixing a panel, in particular a glass panel. The fixing structure may be in the form of a clamp or a longitudinal rail.

Background of the invention

Fixing structure for fixing a panel, in particular a glass panel, over a support structure, such as a balcony, a floor, a platform or the like, are generally known. For example, such fixing structure are widely used in balustrades or railing systems, e.g. for staircases, fences or swimming pool fences, in the form of clamps or longitudinal rails.

For example, from the French application FR3017909 a fixing structure for a balustrade is known including a base element comprising a u-shaped cradle, means for fixing the panel within the cradle and a couple of cover members suitable for covering the base element.

Generally, the cover members are fixed to the base element by means of an adhesive, so that it is very difficult or even impossible to remove or replace them without damaging the cover members and/or the base element.

Moreover, these fixing structure have a poor aesthetic appeal.

Further, the only possibility of customization of the cover members is by applying thereon stickers or the like. Also in this case, it is difficult or even impossible to remove or replace them without damaging the cover members and/or the base element.

Summary of the invention

Object of the present invention is to at least partially overcome the above mentioned drawbacks, by providing a fixing structure, i.e. a clamp or a longitudinal rail, having high functionality and low cost.

A further object of the invention is to provide a fixing structure that allows for an easy and fast coupling / uncoupling of the cover members and the base element.

Another object of the invention is to provide a fixing structure that is simple and fast to install.

A further object of the invention is to provide a fixing structure having a high aesthetic appeal.

Another object of the invention is to provide a fixing structure which is easily and quickly customizable.

These objects, as well as others that will be clearer hereinafter, are fulfilled by a fixing structure according to what is herein described, shown and / or claimed.

Advantageous embodiments of the invention are defined according to the appended claims.

In a first aspect, the invention may relate to a fixing structure, i.e. a clamp or a longitudinal rail, for fixing a panel, such as a glass panel, which is susceptible to lay over a support surface, such as a balcony, a platform, a floor or the like, the fixing structure comprising:

- at least one base element including:

- a lower surface susceptible to come in reciprocal contact with the support surface;
- a cradle susceptible to seat the panel;
- two opposite side surfaces substantially perpendicular to said lower surface susceptible to remain at opposite sides with respect to the panel once inserted into the cradle;

- 5
- means for fixing the panel within said cradle;
 - at least one couple of cover members, each cover member being susceptible to cover a respective side surface;

wherein said cover members and said base element includes snap-fitting means for the reciprocal removable coupling to each other;

- 10
- wherein said snap-fitting removable coupling means includes at least one male member and at least one female member reciprocally engageable / disengageable to each other, one of said cover members and base element including one of said at least one male and female members, the other of said cover members and base element including the other of said at least one male and female members.

- 15
- Advantageously, said at least one male member may include or may consist of at least one male projection susceptible to be snap-fitted engaged into at least one countershaped seat defining said at least one female member.

Suitably, each of said cover members may include a respective at least one male projection, said base element including said at least one female countershaped seat.

- 20
- Preferably, said base element may include a plurality of ribs extending between said side and lower surfaces and said cradle, a plurality of hollow interspaces remaining between said ribs, said at least one female seat being defined by said interspaces between said ribs, the inner surface of said cover members including at least one bulge defining said at least one male projection.

- 25
- In a preferred embodiment, said cover members may be made of a metal sheet, said at least one bulge being preferably made by embossing said metal sheet and subsequently folding the latter so that the embossed part lies within the inner part of the cover members faced to the base element.

- 30
- Advantageously, said base element may further include a front portion and a back portion, said side surfaces and said ribs extending therebetween, said cover members preferably including side walls susceptible to remain reciprocally faced with said side surfaces and opposite front and back walls susceptible to remain faced to the front and back portions, each of said opposite front and back walls including at least one male bulge, the distance between said opposite male bulges being slightly less than the length of said side surfaces, in such a manner that upon insertion of the cover members on the base element the front and back walls deform and elastically snap back to force the male bulges within said female interspaces.

- 35
- Suitably, each side surface may include a respective upper edge portion which is opposite to said lower surface, said cradle preferably extending between said upper edge portions, each cover member including an inner surfaces having at least one male member substantially perpendicularly projecting therefrom to be snap-fitted engaged in corresponding female slots longitudinally extending along the side surfaces of the base element, said each cover member further including a respective hook-shaped portion projecting from said

inner surfaces to reciprocally engage with countershaped seats at the respective upper edge portion to rotate thereon between a position distal from the base element in which said at least one male member and the corresponding female slot are reciprocally disengaged and a position proximal thereto in which said at least one male member and the corresponding female slot are reciprocally engaged.

5 Preferably, said countershaped seats may be substantially rounded to define rotation surfaces, each male member preferably including a base portion projecting from said inner surfaces and a stepped end portion susceptible to come in contact with a respective projecting portion of said female slots to promote the deformation of said base portion, the latter elastically snapping back upon the disengagement thereof.

10 In a preferred but non limiting embodiment, each cover member may have a lower edge susceptible to be faced to the support surface and an opposite upper edge susceptible to come in contact with a respective face of the panel or to remain slightly spaced apart therefrom, each cover member preferably further including a lower portion susceptible to remain faced on the side surfaces of the base element and an upper portion susceptible to remain faced to the panel, the upper portions being slanted with respect to said side surfaces, the upper edges of the cover members coming in contact with the panel upon rotation about said
15 countershaped seats so as to promote the deformation of said upper portions, the latter recovering back to their original shape upon the reciprocal engaging of said male and female members.

Suitably, each lower edge of each cover members has a predetermined distance from said lower surface so as to allow the pulling thereof along a pulling direction which is substantially perpendicular to said side surfaces, in such a manner to promote the reciprocal decoupling of said cover members and said base
20 element, possibly by means of a suitable tool.

In a further aspect, the invention may relate to a glass clamp for fixing a glass panel which is susceptible to lay over a support surface, such as a balcony, a platform, a floor or the like, the glass clamp comprising:

- at least one base element including:
 - a lower surface susceptible to come in reciprocal contact with the support surface;
 - a cradle susceptible to seat the panel;
 - two opposite side surfaces substantially perpendicular to said lower surface susceptible to remain at opposite sides with respect to the panel once inserted into the cradle;
- means for fixing the panel within said cradle;
- at least one couple of cover members, each cover member being susceptible to cover a
25 respective side surface;

wherein said cover members and said base element includes means for the reciprocal removable coupling to each other;

35 wherein said base element includes a plurality of ribs extending between said side and lower surfaces and said cradle, a plurality of hollow interspaces remaining between said ribs.

Preferably, upon coupling of said base element and said cover members the latters may be inserted on the former and upon the decoupling thereof the cover members are decoupled from the base element.

Advantageously, said base element may be made by extrusion of a metal or plastic material.

In a preferred but non limiting embodiment, said removable coupling means may be of the snap-fitting type.

Advantageously, said removable coupling means may include at least one male member and at least one female member reciprocally cooperating to each other, one of said cover members and base element including one of said at least one male and female members, the other of said cover members and base element including the other of said at least one male and female members.

Preferably, said at least one male member may include or may consist of at least one male projection susceptible to be snap-fitted engaged into at least one countershaped seat defining said at least one female member.

In a preferred but non limiting embodiment, each of said cover members may include a respective at least one male member, said base element including said at least one female member.

Suitably, said at least one female member may be defined by said interspaces between said ribs, the inner surface of said cover members including at least one bulge defining said at least one male member.

Preferably, said cover members may be made of a metal sheet, said at least one bulge being suitably made by embossing said metal sheet and subsequently folding the latter so that the embossed part lies within the inner part of the cover members faced to the base element.

Advantageously, each side surface may include a respective upper edge portion which is opposite to said lower surface, said cradle extending preferably between said upper edge portions, each cover member including an inner surfaces having at least one male member substantially perpendicularly projecting therefrom to be snap-fitted engaged in corresponding female slots longitudinally extending along the side surfaces of the base element, said each cover member further including a respective hook-shaped portion projecting from said inner surfaces to reciprocally engage with countershaped seats at the respective upper edge portion to rotate thereon between a position distal from the base element in which said at least one male member and the corresponding female slot are reciprocally disengaged and a position proximal thereto in which said at least one male member and the corresponding female slot are reciprocally engaged.

In a further aspect, the invention may relate to a fixing structure for fixing a panel, such as a glass panel, which is susceptible to lay over a support surface, such as a balcony, a platform, a floor or the like, the fixing structure being in the form of a clamp or a longitudinal rail comprising:

- at least one base element including:
 - a lower surface susceptible to come in reciprocal contact with the support surface;
 - a cradle susceptible to seat the panel;
 - two opposite side surfaces substantially perpendicular to said lower surface susceptible to remain at opposite sides with respect to the panel once inserted into the cradle;
- means for fixing the panel within said cradle;
- at least one couple of cover members, each cover member being susceptible to cover a respective side surface;

- electric supplying means;
- at least one electric device electrically connected thereto,

wherein said cover members and said base element includes means for the reciprocal removable coupling to each other;

5 wherein each cover member includes an inner surface susceptible to be faced to the base element and an outer surface susceptible to remain exposed, said at least one electric device laying over the outer surface of at least one of the cover members, said base element and/or the inner surface of said cover members including a channel extending from the lower surface of the base element and/or the lower edge of the cover members to allow the passage of said electric supplying means therethrough, an aperture passing through said
10 cover members being provided so as to allow the electric connection of the electric supplying means and said at least one electric device.

Preferably, said at least one electric device may be a solar panel or a LED light.

Advantageously, said at least one electric device may lie on the upper portion of said at least one cover member.

15 In a preferred but not exclusive embodiment, upon coupling of said base element and said cover members the latters may be inserted on the former and upon the decoupling thereof the cover members are decoupled from the base element.

Suitably, said removable coupling means may be of the snap-fitting type.

Advantageously, said removable coupling means may include at least one male member and at least
20 one female member reciprocally cooperating to each other, one of said cover members and base element preferably including one of said at least one male and female members, the other of said cover members and base element including the other of said at least one male and female members.

In a preferred but not limiting embodiment, said at least one male member may include or may consist of at least one male projection susceptible to be snap-fitted engaged into at least one countershaped
25 seat defining said at least one female member.

Advantageously, each of said cover members may include a respective at least one male member, said base element preferably including said at least one female member.

Suitably, said base element may include a plurality of ribs extending between said side and lower surfaces and said cradle, a plurality of hollow interspaces remaining between said ribs, said base element being
30 preferably made by extrusion of a metal or plastic material.

Preferably, at least one of said cover members may include a laminar decorative member removably couplable with the outer surface thereof.

In a further aspect, the invention may relate to a fixing structure for fixing a panel, such as a glass panel, which is susceptible to lay over a support surface, such as a balcony, a platform, a floor or the like, the
35 fixing structure being in the form of a clamp or a longitudinal rail comprising:

- at least one base element including:
 - a lower surface susceptible to come in reciprocal contact with the support surface;

- a cradle susceptible to seat the panel;
- two opposite side surfaces substantially perpendicular to said lower surface susceptible to remain at opposite sides with respect to the panel once inserted into the cradle;
- means for fixing the panel within said cradle;

5 - at least one couple of cover members, each cover member being susceptible to cover a respective side surface;

 wherein said cover members and said base element includes means for the reciprocal removable coupling to each other;

10 wherein at least one of said cover members includes one or more laminar decorative member removably couplable with the outer surface thereof.

 Suitably, said at least one of said cover members may include a pivot edge portion and an opposite edge portion, said laminar decorative member preferably including an upper and a lower end, one of the latter being engageable with said pivot portion to rotate thereon, the other upper or lower end of said laminar decorative member being couplable in a snap-fitting manner on the cover member in correspondence of said
15 opposite edge portion.

 Advantageously, said pivot portion may be defined by the upper edges of said cover members, the upper end of said laminar decorative member rotating thereon to allow the snap-fitting of said opposite lower end on the lower edge of the cover members.

20 Preferably, said pivot portion may be defined by a slot arranged on the outer surface of the cover members, the lower end of said laminar decorative member being insertable therein to allow the rotational snap-fitting of the opposite upper end on the upper edge of the cover members.

 In a preferred but non-exclusive embodiment, said lower end of said laminar decorative member may be a folding portion foldable along a folding line, the rotation occurring about said folding line.

25 Suitably, upon coupling of said base element and said cover members the latter may be inserted on the former and upon the decoupling thereof the cover members are decoupled from the base element.

 In a preferred but non limiting embodiment, said removable coupling means may be of the snap-fitting type.

30 Advantageously, said removable coupling means may include at least one male member and at least one female member reciprocally cooperating to each other, one of said cover members and base element including one of said at least one male and female members, the other of said cover members and base element including the other of said at least one male and female members.

 Suitably, said at least one male member may include or may consist of at least one male projection susceptible to be snap-fitted engaged into at least one countershaped seat defining said at least one female member.

35 Preferably, each of said cover members may include a respective at least one male member, said base element including said at least one female member.

Brief description of the drawings

Further features and advantages of the invention will be clearer upon reading the detailed description of some preferred but not exclusive embodiments of the invention, shown by way of not limitative example with the help of the annexed drawings, wherein:

- FIG. 1** is an axonometric exploded view of a first embodiment of a fixing structure **1**;
- FIGS. 2a to 2d** are sectional views of the insertion of a cover member **20'** on a base element **10** in the embodiment of the fixing structure **1** of Fig. 1;
- FIG. 3** is an enlarged view of some particulars of FIG. 2c;
- FIGS. 4a to 4b** are enlarged views of some particulars of FIG. 2d;
- FIGS. 5a to 5b** are schematic views of the removal of the cover member **20'** from the base element **10** in the embodiment of the fixing structure **1** of Fig. 1;
- FIG. 6** is an axonometric exploded view of another embodiment of a fixing structure **1**;
- FIG. 7** is an axonometric view of a fixing structure **1** in the form of a clamp;
- FIG. 8** is an axonometric view of a fixing structure **1** in the form of a longitudinal rail;
- FIG. 9a** is an exploded side view of another embodiment of a fixing structure **1**;
- FIG. 9b** is an axonometric sectional view of the embodiment of a fixing structure **1** of FIG. 9a;
- FIG. 9c** is an enlarged view of some particulars of FIG. 9b;
- FIG. 10a** is an axonometric sectional view of a further embodiment of a fixing structure **1**;
- FIG. 10b** is a sectional view of the embodiment of the fixing structure **1** of FIG. 10a;
- FIGS. 10c and 10d** are enlarged views of some particulars of FIG. 10b;
- FIGS. 11a and 11b** are axonometric views of further embodiments of a fixing structure **1**;
- FIG. 12** is a schematic side view of a further embodiment of a fixing structure **1**;
- FIGS. 13a and 13b** are enlarged views of some particulars of FIG. 12;
- FIG. 14a** is an axonometric exploded view of another embodiment of a fixing structure **1**;
- FIG. 14b** is a side view of the embodiment of the fixing structure **1** of FIG. 14a;
- FIGS. 14c and 14d** are enlarged sectional views of some particulars of FIG. 14b.

Detailed description of some preferred embodiments of the invention

With reference to the above mentioned figures, a fixing structure **1** is described for fixing a panel **P** over a support surface **S**.

In a preferred but not exclusive embodiment, the fixing structure **1** may be used in architectural glass applications, e.g. a balustrade or a railing system of a staircase.

In general, the fixing structure **1** according to the present invention may be in the form of a clamp, as shown e.g. in FIG. 7, or in the form of a longitudinal rail, as shown e.g. in FIG. 8.

More particularly, the fixing structure **1** may be used to fix a glass panel **P**, preferably a safety glass, over a balcony, a platform, a floor or the like.

The fixing structure **1** generally includes a base element **10**, a couple of cover members **20**, **20'** and means **30** for fixing the panel **P** to the base element **10**.

The base element **10** is susceptible to be fastened on the support surface **S** in a *per se* known manner, and may generally have a parallelepiped or cylindrical shape.

The support base may be made of only one piece, as shown e.g. in FIG. 6, or made of two superimposed pieces, as shown e.g. in FIGs. 1 and 10a.

5 More in general, the base element **10** includes a pair of side surfaces **11**, **11'**, designed to remain at opposite sides with respect to the panel **P**, a lower surface **12** designed to contact the support surface **S** and a U-shaped cradle **13**.

10 In case of cylindrical shaped fixing structure, which may advantageously have the form of a clamp, the side surfaces **11**, **11'** may be curved. On the other side, in case of parallelepiped fixing structure, such as the one shown in the annexed figures, the base element **10** may further include a front portion **11''** and a back portion **11'''**, the side surfaces **11**, **11'** extending therebetween.

Advantageously, the base element **10** may be made by extrusion, with a plurality of ribs **14** extending between the surfaces **11**, **11'**, **12** and the cradle **13**.

15 In this manner, a very low-cost fixing structure **1** is provided. This is also advantageous because it is possible to use the same base element both for longitudinal rails and clamps, only the length differing to each other.

It is understood that the base element **10** may be made of different material and/or by different process.

20 For example, the base element **10** may be made of composite material. In this case the base element **10** may be made by molding.

Once the panel **P** is mounted on the base element **10**, each side surface **11**, **11'** remains at opposite sides with respect to the panel **P**, each in correspondence of a respective face **F1**, **F2** thereof.

25 The fixing means **30** are suitable for fixing the panel **P** within the cradle **13**. To this end, the fixing means **30** may be designed according to the teachings of the French patent FR3017909 or the French application FR3058743, in the name of the same Applicant, which are referred to for proper consultation.

In the embodiments shown in the annexed figures, the fixing means **30** may include a couple of fixing wedges **31'**, **31''** to be vertically moved by acting on the screws **32'**, **32''**.

Each cover member **20**, **20'** may be of a laminar type, made of e.g. a folded or stamped metal sheet or moulded plastic sheet having a thickness of 1 mm.

30 In general, the thickness and more in general the mechanical properties of the cover members **20**, **20'** may be such as to allow deformation thereof upon insertion / removal on / from the base element **10**, as better explained below.

It is understood that the cover members **20**, **20'** may be of different material. Moreover, the cover members **20**, **20'** may have different shapes, for example rounded shapes.

35 Once mounted on the base element **10**, the cover members **20**, **20'** are designed to remain reciprocally faced with the side surfaces **11**, **11'**.

To this end, each cover member **20**, **20'** may include a side wall **20''**, **20'''** susceptible to remain

reciprocally faced with the side surfaces **11**, **11'** and if necessary two front and back walls **28**, **28'** to remain faced to the front and back portions **11''**, **11'''**.

Advantageously, the side walls **20''**, **20'''** may include or may be formed by two superimposed planar portions **21'**, **21''** and **22'**, **22''**, which are angularly spaced to each other.

5 More precisely, once the cover members **20**, **20'** are mounted on the base element **10**, the lower portions **21'**, **22'** remain faced on the latter and substantially parallel to the side surfaces **11**, **11'**, whereas the upper portions **21''**, **22''** remain faced on the panel **P** and slanted with respect to the side surfaces **11**, **11'**.

Advantageously, each cover member **20**, **20'** may have a lower edge **23'**, **23''** susceptible to be faced to the support surface **S** and an upper edge **24'**, **24''** susceptible to come in contact with a respective face **F1**, **F2** of the panel **P** or to remain slightly spaced apart therefrom.

In a preferred but not exclusive embodiment of the invention, the lower portions **21'**, **22'** and the upper portions **21''**, **22''** of the cover members **20**, **20'** may be reciprocally consecutive. In other words, the cover members **20**, **20'** may consist solely of the lower portions **21'**, **22'** and the upper portions **21''**, **22''**.

Advantageously, the lower portions **21'**, **22'** of the cover members **20**, **20'** may be substantially coextensive with the side surfaces **11**, **11'** of the base element **10**.

In general, the cover members **20**, **20'** and the base element **10** may be reciprocally coupled in a removable manner, i.e. they may be coupled and decoupled without damages.

To this end, suitable removable coupling means may be used, thanks to which the cover members **20**, **20'** may be inserted / removed on / from the base element **10** to accomplish the reciprocal coupling / uncoupling.

Preferably, the removable coupling means may be of the snap-fitting type. More precisely, the snap-fitting removable coupling means may be designed in such a manner that upon the insertion of the cover members **20**, **20'** on the base element **10** the formers remain coupled to the latter thanks to one or more male members reciprocally engaging with one or more corresponding female members, whereas upon the removal of the cover members **20**, **20'** from the base element **10** the one or more male and female members reciprocally disengage.

To this end, the one or more male and female members may be reciprocally countershaped.

Accordingly, in the embodiments shown in FIGs. 1 to 2d, 6, 10a and 10b, the cover members **20**, **20'** may include male members **25** and **26** substantially perpendicularly projecting from the inner surfaces **27**, **27'** to be snap-fitted engaged in corresponding female slots **15** and **16** longitudinally extending along the side surfaces **11**, **11'** of the base element **10**. More precisely, each male member **25**, **26** may include a base portion **25'**, **26'** and a stepped portion **25''**, **26''**.

On the other hand, in the embodiments shown in FIGs. 9a to 9c, the cover members **20**, **20'** may include two couples of male bulges **25**, **26** projecting from the faced front and back walls **28**, **28'** to be snap-fitted engaged in corresponding female seats **15** and **16** defined by the interspaces between ribs **14**.

Advantageously, the bulges **25**, **26** may be made by embossing a metal sheet and subsequently folding the latter so that the embossed part lies within the inner part of the cover members **20**, **20'** faced to the base

element **10**. In this manner, it is possible to obtain very low-cost cover members **20, 20'** provided with male members.

In any event, upon the snap-fitting engagement and disengagement of the male and female members the wall supporting the male member may elastically deform and snap back to its original shape thanks to its elasticity.

In the embodiment shown in FIGs. 9a to 9c the cover members **20, 20'** may be inserted / removed on / from the base element **10** by sliding along a direction which is substantially perpendicular to the side surfaces **11, 11'**.

Thanks to the fact that the distance **d** between the opposite male members **25, 26** is slightly less than the length **l** of the side surfaces **11, 11'**, upon insertion the front and back walls **28, 28'** deform and elastically return back to force the male members **25, 26** within the seats **15, 16**, the reverse occurring upon removal.

It is understood that the embodiment shown in FIGs. 9a to 9c is preferable in case of fixing structure **1** in form of a clamp.

On the other hand, in the embodiments shown in FIGs. 1 to 2d, 6, 10a and 10b the cover members **20, 20'** may be inserted / removed on / from the base element **10** by rotation of the formers about the latter, and more precisely about the upper edge portions **17, 17'** of the side surfaces **11, 11'** of the base element **10**.

Accordingly, the cover members **20, 20'** may include a hook-shaped portion **29, 29'** projecting from the inner surfaces **27, 27'** to reciprocally engage with countershaped seats **18, 18'** of the upper edge portions **17, 17'**. More precisely, the countershaped seats **18, 18'** may extend in longitudinal direction substantially parallel to the side surfaces **11, 11'** and may be eventually rounded, so as to define rotation surfaces about which the cover members **20, 20'** may rotate.

Therefore, in order to insert the cover members **20, 20'** on the base element **10** it is necessary at first reciprocally engaging the hook-shaped portions **29, 29'** with the countershaped seats **18, 18'** (FIGs 2b and 2c) and then rotate the cover members **20, 20'** (FIG. 3) so as to allow the insertion of the male members **25, 26** within the longitudinal slots **15, 16**.

When the stepped portions **25'', 26''** of the male members **25, 26** come in contact with the projecting portions **15', 16'** of the slots **15, 16** the base portions **25', 26'** deform, by snapping back to their original shape upon the disengagement thereof. Upon the removal of the cover members **20, 20'** from the base element **10**, the reverse occurs.

During the above rotation, the upper edges **24', 24''** of the cover members **20, 20'** may come in contact with the panel **P**. Thanks to its elasticity, upon this contact each upper portion **21', 21''** may deform (FIG. 3) and subsequently recover its original shape when the male members **25, 26** and the slots **15, 16** are reciprocally engaged.

Advantageously, as shown in the FIGs 5a and 5b, the removal of the cover members **20, 20'** from the base element **10** may occur by pulling the formers along a direction which is substantially perpendicular to the side surfaces **11, 11'** by means of a suitable removing tool **40**.

More precisely, the removing tool **40** may include a handle **41** and a stepped head **42** to be placed in

correspondence of the lower edges **23'**, **23''** of the cover members **20**, **20'** (FIG. 5b). From this position, a user in order to promote the removal of the cover members **20**, **20'** from the base element **10** has just has just to pull out the removing tool **40** by acting on the handle **41**.

To allow the correct placement of the stepped head **42** in correspondence of the lower edges **23'**, **23''**, the latter may have a distance **d'** from the lower surface **12** which is more, equal or slightly less than the maximum height **h** of the removing tool **40**.

In a preferred but not exclusive embodiment, shown for example in FIGs 10a to 10d, the fixing structure **1** may include electric supplying means **50**, e.g. one or more electrical cables, and an electric device **51** electrically connected thereto.

As non-limitative example, the electric device **51** may be a solar panel or a LED light, e.g. a LED strip.

Advantageously, the cover members **20**, **20'** and/or the base element **10** may include a channel **52** extending from the lower surface **12** to the electric device **51** to allow the insertion of the electric supplying means **50** therethrough.

In the FIGs 10a to 10d an embodiment is shown in which the cover members **20**, **20'** includes a passing-through aperture defining the interspace **52**. Equivalently, the latter may be defined by a hole passing through the base element **10** or by an interspace between the cover members **20**, **20'** and the base element **10**, the latter being suitably spaced apart to each other.

In order to allow the electric connection between the electric supplying means **50** and the electric device **51**, the cover members **20**, **20'** may include a passing through aperture **53**.

In this manner, it is possible to maintain completely hidden the supplying means **50** within the cover members **20**, **20'**, only the electric device **51** remaining exposed. In fact, the latter may lay on the outer surface **27''**, **27'''** of the cover members **20**, **20'**, preferably in correspondence of the upper portions **21''**, **22''** and/or lower portions **21'**, **22'** thereof.

The supplying means **50** may pass through the support surface **S**, as shown in FIG. 10d.

Preferably, the electric device **51** may have a generally flat shape and dimensions not exceeding the upper portions **21''**, **22''**, so as to extend along the latter. This may be particularly advantageous in case of electric device **51** in the form of a solar panel or a LED light.

In a preferred but not exclusive embodiment, shown for example in FIGs 11a to 14d, the cover members **20**, **20'** may include a decorative member **60** laying on the outer surfaces **27''**, **27'''**.

In general, the decorative member **60** may be interchangeable, so as to allow the customization of the fixing structure **1**.

To this end, in a first embodiment shown e.g. in FIGs 11a and 11b the decorative member **60** may be a sticker or the like applied on the outer surfaces **27''**, **27'''** of the cover members **20**, **20'**. Equivalently, the decorative member **60** may also be painted, engraved or the like on the outer surfaces **27''**, **27'''** of the cover members **20**, **20'**.

In this case, in order to interchange the decorative members **60** it is necessary to interchange the whole cover members **20**, **20'**.

On the other hand, in other embodiments shown e.g. in FIGs 12 to 14d, the decorative member **60** may be a laminar element removably coupled to the outer surfaces **27''**, **27'''** of the cover members **20**, **20'**.

In this manner, in order to interchange the laminar decorative members **60** it is not necessary to interchange the whole cover members **20**, **20'**, but simply removing a laminar decorative member **60** from a
5 cover member and replacing it with a new one.

Advantageously, the laminar decorative member **60** may have the upper or lower end **61**, **62** which is engageable with a pivot portion **63** of the corresponding cover member **20**, **20'** to rotate thereon, the other upper or lower end **61**, **62** being couplable in a snap-fitting manner on the cover member **20**, **20'**.

In a first embodiment, shown e.g. in FIGs. 12 to 13b, the pivot portion **63** may be defined by the upper
10 edge **24'**, **24''**, the upper end **61** of the laminar decorative member **60** rotating thereon to allow the snap-fitting of the opposite lower end **62** with the lower edge **23'**, **23''** of the cover members **20**, **20'**.

In another embodiment, shown e.g. in FIGs. 14a to 14d, the pivot portion **63** may be defined by a slot **64** of the outer surface **27''**, **27'''** of the cover members **20**, **20'**, into which the lower end **62** of the laminar decorative member **60** is to be inserted.

To allow the rotation movement, the lower end **62** of the laminar decorative member **60** may be made
15 as a folding portion, so that the rotation occurs along the folding line **65**.

Therefore, the remaining portion **66** of the laminar decorative member **60** is rotated about the folding line **65** to allow the snap-fitting of the opposite upper end **61** on the upper edge **24'**, **24''** of the cover members **20**, **20'**.

Thanks to the above feature, it is possible to customize and improve the aesthetic appeal of the fixing
20 device **1** in a simple and quick manner.

In view of the foregoing, it is apparent that the invention fulfils the intended objects.

The invention is susceptible of numerous modifications and variations, all falling within the appended claims. All the details may be replaced by other technically equivalent elements, and the materials may be
25 different according to requirements, without departing from the scope of protection of the invention defined by the appended claims.

CLAIMS

1. A fixing structure for fixing a panel (P), such as a glass panel, which is susceptible to lay over a support surface (S), such as a balcony, a platform, a floor or the like, the fixing structure being in the form of a clamp or a longitudinal rail comprising:

- at least one base element (10) including:
 - a lower surface (12) susceptible to come in reciprocal contact with the support surface (S);
 - a cradle (13) susceptible to seat the panel;
 - two opposite side surfaces (11, 11') substantially perpendicular to said lower surface (12) susceptible to remain at opposite sides with respect to the panel (P) once inserted into the cradle (13);
- means (30) for fixing the panel (P) within said cradle (13);
- at least one couple of cover members (20, 20'), each cover member (20, 20') being susceptible to cover a respective side surface (11, 11');

wherein said cover members (20, 20') and said base element (10) includes means (15, 16; 25, 26) for the reciprocal removable coupling to each other.

2. Fixing structure according to claim 1, wherein at least one of said cover members (20, 20') includes a laminar decorative member (60) removably couplable with the outer surface (27'', 27''') thereof.

3. Fixing structure according to the preceding claim, wherein said at least one of said cover members (20, 20') includes a pivot edge portion (63) and an opposite edge portion (23', 23''; 24', 24''), said laminar decorative member (60) includes an upper and a lower end (61, 62), one of the latter (61, 62) being engageable with said pivot portion (63) to rotate thereon, the other upper or lower end (61, 62) of said laminar decorative member (60) being couplable in a snap-fitting manner on the cover member (20, 20') in correspondence of said opposite edge portion (23', 23''; 24', 24'').

4. Fixing structure according to claim 2 or 3, wherein said pivot portion (63) is defined by the upper edges (24', 24'') of said cover members (20, 20'), the upper end (61) of said laminar decorative member (60) rotating thereon to allow the snap-fitting of said opposite lower end (62) on the lower edge (23', 23'') of the cover members (20, 20').

5. Fixing structure according to claim 2 or 3, wherein said pivot portion (63) is defined by a slot (64) arranged on the outer surface (27'', 27''') of the cover members (20, 20'), the lower end (62) of said laminar decorative member (60) being insertable therein to allow the rotational snap-fitting of the opposite upper end (61) on the upper edge (24', 24'') of the cover members (20, 20').

6. Fixing structure according to the preceding claim, wherein said lower end (62) of said laminar decorative member (60) is a folding portion foldable along a folding line (65), the rotation occurring about said folding line (65).

7. Fixing structure according to one or more of the preceding claims, wherein upon coupling of said base element (10) and said cover members (20, 20') the latters are inserted on the former and upon the decoupling thereof the cover members (20, 20') are decoupled from the base element (10).

8. Fixing structure according to one or more of the preceding claims, wherein said removable coupling means (15, 16; 25, 26) are of the snap-fitting type.

9. Fixing structure according to one or more of the preceding claims, wherein said removable coupling means (15, 16; 25, 26) includes at least one male member (15, 16) and at least one female member (25, 26) reciprocally cooperating to each other, one of said cover members (20, 20') and base element (10) including one of said at least one male and female members (15, 16; 25, 26), the other of said cover members (20, 20') and base element (10) including the other of said at least one male and female members (15, 16; 25, 26).

10. Fixing structure according to the preceding claim, wherein said at least one male member (25, 26) includes or consists of at least one male projection susceptible to be snap-fitted engaged into at least one countershaped seat (15, 16) defining said at least one female member.

11. Fixing structure according to claim 9 or 10, wherein each of said cover members (20, 20') includes a respective at least one male member (25, 26), said base element (10) including said at least one female member (15, 16).

12. Fixing structure according to one or more of the preceding claims, wherein said base element (10) includes a plurality of ribs (14) extending between said side and lower surfaces (11, 11', 12) and said cradle (13), a plurality of hollow interspaces remaining between said ribs (14), said base element (10) being preferably made by extrusion of a metal or plastic material.

13. Fixing structure according to the preceding claim, wherein said at least one female member (15, 16) is defined by said interspaces between said ribs (14), the inner surface of said cover members (20, 20') including at least one bulge defining said at least one male member (25, 26).

14. Fixing structure according to the preceding claim, wherein said cover members (20, 20') are made of a metal sheet, said at least one bulge (25, 26) being made by embossing said metal sheet and subsequently folding the latter so that the embossed part lies within the inner part of the cover members (20, 20') faced to the base element (10).

15. Fixing structure according to the claim 13 or 14, wherein said base element (10) further includes a front portion and a back portion (11'', 11'''), said side surfaces (11, 11') and said ribs (14) extending therebetween, said cover members (20, 20') including side walls (20'', 20''') susceptible to remain reciprocally faced with said side surfaces (11, 11') and opposite front and back walls (28, 28') susceptible to remain faced to the front and back portions (11'', 11'''), each of said opposite front and back walls (28, 28') including at least one male bulge (25, 26).

16. Fixing structure according to the preceding claim, wherein the distance (d) between said opposite male bulges (25, 26) is slightly less than the length (l) of said side surfaces (11, 11'), in such a manner that upon insertion of the cover members (20, 20') on the base element (10) the front and back walls (28, 28') deform and elastically snap back to force the male bulges (25, 26) within said female interspaces (15, 16).

17. Fixing structure according to one or more of the preceding claims, wherein each side surface (11, 11') includes a respective upper edge portion (17, 17') which is opposite to said lower surface (12), said cradle

(13) extending between said upper edge portions (17, 17'), each cover member (20, 20') including an inner surfaces (27, 27') having at least one male member (25, 26) substantially perpendicularly projecting therefrom to be snap-fitted engaged in corresponding female slots (15, 16) longitudinally extending along the side surfaces (11, 11') of the base element (10), said each cover member (20, 20') further including a respective hook-shaped portion (29, 29') projecting from said inner surfaces (27, 27') to reciprocally engage with countershaped seats (18, 18') at the respective upper edge portion (17, 17') to rotate thereon between a position distal from the base element (10) in which said at least one male member (25, 26) and the corresponding female slot (15, 16) are reciprocally disengaged and a position proximal thereto in which said at least one male member (25, 26) and the corresponding female slot (15, 16) are reciprocally engaged.

18. Fixing structure according to the preceding claim, wherein said countershaped seats (18, 18') are substantially rounded to define rotation surfaces, each male member (25, 26) including a base portion (25', 26') projecting from said inner surfaces (27, 27') and a stepped end portion (25'', 26'') susceptible to come in contact with a respective projecting portion (15', 16') of said female slots (15, 16) to promote the deformation of said base portion (25', 26'), the latter elastically snapping back upon the disengagement thereof.

19. Fixing structure according to the preceding claim, wherein each cover member (20, 20') has a lower edge (23', 23'') susceptible to be faced to the support surface (S) and an opposite upper edge (24', 24'') susceptible to come in contact with a respective face (F1, F2) of the panel (P) or to remain slightly spaced apart therefrom, each cover member (20, 20') further including a lower portion (21', 22') susceptible to remain faced on the side surfaces (11, 11') of the base element (10) and an upper portion (21'', 22'') susceptible to remain faced to the panel (P), the upper portions (21'', 22'') being slanted with respect to said side surfaces (11, 11'), the upper edges (24', 24'') of the cover members (20, 20') coming in contact with the panel (P) upon rotation about said countershaped seats (18, 18') so as to promote the deformation of said upper portions (21'', 22''), the latter recovering back to their original shape upon the reciprocal engaging of said male and female members (25, 26; 15, 16).

20. Fixing structure according to one or more of the preceding claims, wherein each lower edge (23', 23'') of each cover members (20, 20') has a predetermined distance (d') from said lower surface (12) so as to allow the pulling thereof along a pulling direction which is substantially perpendicular to said side surfaces (11, 11'), in such a manner to promote the reciprocal decoupling of said cover members (20, 20') and said base element (10).

21. Fixing structure according to one or more of the preceding claims, wherein each cover member (20, 20') includes an inner surface (27, 27') susceptible to be faced to the base element (10) and an outer surface (27'', 27''') susceptible to remain exposed, the fixing structure (1) further including electric supplying means (50) and at least one electric device (51) electrically connected thereto, the latter laying on the outer surface (27'', 27''') of at least one of the cover members (20, 20'), said base element (10) and/or the inner surface (27, 27') of said cover members (20, 20') including a channel (52) extending from the lower surface (12) of the base element (10) and/or the lower edge (23', 23'') of the cover members (20, 20') to allow the passage of said electric supplying means (50) therethrough, an aperture (53) passing through said cover members (20,

20') being provided so as to allow the electric connection of the electric supplying means (**50**) and said at least one electric device (**51**).

22. Fixing structure according to the preceding claim, wherein said at least one electric device (**51**) is a solar panel or a LED light.

23. Fixing structure according to the claim 21 or 22, wherein said at least one electric device (**51**) lies on the upper portion (**21''**, **22''**) of said at least one cover member (**20**, **20'**).

24. A fixing structure for fixing a panel (**P**), such as a glass panel, which is susceptible to lay over a support surface (**S**), such as a balcony, a platform, a floor or the like, the fixing structure being in the form of a clamp or a longitudinal rail comprising:

- at least one base element (**10**) including:
 - a lower surface (**12**) susceptible to come in reciprocal contact with the support surface (**S**);
 - a cradle (**13**) susceptible to seat the panel;
 - two opposite side surfaces (**11**, **11'**) substantially perpendicular to said lower surface (**12**) susceptible to remain at opposite sides with respect to the panel (**P**) once inserted into the cradle (**13**);
- means (**30**) for fixing the panel (**P**) within said cradle (**13**);
- at least one couple of cover members (**20**, **20'**), each cover member (**20**, **20'**) being susceptible to cover a respective side surface (**11**, **11'**);

wherein said cover members (**20**, **20'**) and said base element (**10**) includes snap-fitting means (**15**, **16**; **25**, **26**) for the reciprocal removable coupling to each other;

wherein said snap-fitting removable coupling means (**15**, **16**; **25**, **26**) includes at least one male member (**15**, **16**) and at least one female member (**25**, **26**) reciprocally engageable / disengageable to each other, one of said cover members (**20**, **20'**) and base element (**10**) including one of said at least one male and female members (**15**, **16**; **25**, **26**), the other of said cover members (**20**, **20'**) and base element (**10**) including the other of said at least one male and female members (**15**, **16**; **25**, **26**).

25. Fixing structure according to the claim 24, wherein said at least one male member (**25**, **26**) includes or consists of at least one male projection susceptible to be snap-fitted engaged into at least one countershaped seat (**15**, **16**) defining said at least one female member.

26. Fixing structure according to claim 25, wherein each of said cover members (**20**, **20'**) includes a respective at least one male projection (**25**, **26**), said base element (**10**) including said at least one female countershaped seat (**15**, **16**).

27. Fixing structure according to the preceding claim, wherein said base element (**10**) includes a plurality of ribs (**14**) extending between said side and lower surfaces (**11**, **11'**, **12**) and said cradle (**13**), a plurality of hollow interspaces remaining between said ribs (**14**), said at least one female seat (**15**, **16**) being defined by said interspaces between said ribs (**14**), the inner surface of said cover members (**20**, **20'**) including at least one bulge defining said at least one male projection (**25**, **26**).

28. Fixing structure according to the preceding claim, wherein said cover members (**20**, **20'**) are

made of a metal sheet, said at least one bulge (25, 26) being made by embossing said metal sheet and subsequently folding the latter so that the embossed part lies within the inner part of the cover members (20, 20') faced to the base element (10).

29. Fixing structure according to claim 27 or 28, wherein said base element (10) further includes a front portion and a back portion (11'', 11'''), said side surfaces (11, 11') and said ribs (14) extending therebetween, said cover members (20, 20') including side walls (20'', 20''') susceptible to remain reciprocally faced with said side surfaces (11, 11') and opposite front and back walls (28, 28') susceptible to remain faced to the front and back portions (11'', 11'''), each of said opposite front and back walls (28, 28') including at least one male bulge (25, 26), the distance (d) between said opposite male bulges (25, 26) being slightly less than the length (l) of said side surfaces (11, 11'), in such a manner that upon insertion of the cover members (20, 20') on the base element (10) the front and back walls (28, 28') deform and elastically snap back to force the male bulges (25, 26) within said female interspaces (15, 16).

30. Fixing structure according to claim 26, wherein each side surface (11, 11') includes a respective upper edge portion (17, 17') which is opposite to said lower surface (12), said cradle (13) extending between said upper edge portions (17, 17'), each cover member (20, 20') including an inner surfaces (27, 27') having at least one male member (25, 26) substantially perpendicularly projecting therefrom to be snap-fitted engaged in corresponding female slots (15, 16) longitudinally extending along the side surfaces (11, 11') of the base element (10), said each cover member (20, 20') further including a respective hook-shaped portion (29, 29') projecting from said inner surfaces (27, 27') to reciprocally engage with countershaped seats (18, 18') at the respective upper edge portion (17, 17') to rotate thereon between a position distal from the base element (10) in which said at least one male member (25, 26) and the corresponding female slot (15, 16) are reciprocally disengaged and a position proximal thereto in which said at least one male member (25, 26) and the corresponding female slot (15, 16) are reciprocally engaged.

31. Fixing structure according to the preceding claim, wherein said countershaped seats (18, 18') are substantially rounded to define rotation surfaces, each male member (25, 26) including a base portion (25', 26') projecting from said inner surfaces (27, 27') and a stepped end portion (25'', 26'') susceptible to come in contact with a respective projecting portion (15', 16') of said female slots (15, 16) to promote the deformation of said base portion (25', 26'), the latter elastically snapping back upon the disengagement thereof.

32. Fixing structure according to the preceding claim, wherein each cover member (20, 20') has a lower edge (23', 23'') susceptible to be faced to the support surface (S) and an opposite upper edge (24', 24'') susceptible to come in contact with a respective face (F1, F2) of the panel (P) or to remain slightly spaced apart therefrom, each cover member (20, 20') further including a lower portion (21', 22') susceptible to remain faced on the side surfaces (11, 11') of the base element (10) and an upper portion (21'', 22'') susceptible to remain faced to the panel (P), the upper portions (21'', 22'') being slanted with respect to said side surfaces (11, 11'), the upper edges (24', 24'') of the cover members (20, 20') coming in contact with the panel (P) upon rotation about said countershaped seats (18, 18') so as to promote the deformation of said upper portions (21'', 22''), the latter recovering back to their original shape upon the reciprocal engaging of said male and female

members (25, 26; 15, 16).

33. Fixing structure according to one or more of the claims 24 to 32, wherein each lower edge (23', 23'') of each cover members (20, 20') has a predetermined distance (d') from said lower surface (12) so as to allow the pulling thereof along a pulling direction which is substantially perpendicular to said side surfaces (11, 11'), in such a manner to promote the reciprocal decoupling of said cover members (20, 20') and said base element (10), possibly by means of a suitable tool (40).

34. A glass clamp for fixing a glass panel (P) which is susceptible to lay over a support surface (S), such as a balcony, a platform, a floor or the like, the glass clamp comprising:

- at least one base element (10) including:
 - a lower surface (12) susceptible to come in reciprocal contact with the support surface (S);
 - a cradle (13) susceptible to seat the panel;
 - two opposite side surfaces (11, 11') substantially perpendicular to said lower surface (12) susceptible to remain at opposite sides with respect to the panel (P) once inserted into the cradle (13);
- means (30) for fixing the panel (P) within said cradle (13);
- at least one couple of cover members (20, 20'), each cover member (20, 20') being susceptible to cover a respective side surface (11, 11');

wherein said cover members (20, 20') and said base element (10) includes means (15, 16; 25, 26) for the reciprocal removable coupling to each other;

wherein said base element (10) includes a plurality of ribs (14) extending between said side and lower surfaces (11, 11', 12) and said cradle (13), a plurality of hollow interspaces remaining between said ribs (14).

35. Glass clamp according to claim 34, wherein upon coupling of said base element (10) and said cover members (20, 20') the latters are inserted on the former and upon the decoupling thereof the cover members (20, 20') are decoupled from the base element (10).

36. Glass clamp according to claim 34 or 35, said base element (10) being made by extrusion of a metal or plastic material.

37. Glass clamp according to claim 34, 35 or 36, wherein said removable coupling means (15, 16; 25, 26) are of the snap-fitting type.

38. Glass clamp according to claim 34, 35, 36 or 37, wherein said removable coupling means (15, 16; 25, 26) includes at least one male member (15, 16) and at least one female member (25, 26) reciprocally cooperating to each other, one of said cover members (20, 20') and base element (10) including one of said at least one male and female members (15, 16; 25, 26), the other of said cover members (20, 20') and base element (10) including the other of said at least one male and female members (15, 16; 25, 26).

39. Glass clamp according to the preceding claim, wherein said at least one male member (25, 26) includes or consists of at least one male projection susceptible to be snap-fitted engaged into at least one countershaped seat (15, 16) defining said at least one female member.

40. Glass clamp according to claim 38 or 39, wherein each of said cover members (20, 20') includes a

respective at least one male member (25, 26), said base element (10) including said at least one female member (15, 16).

41. Glass clamp according to the preceding claim, wherein said at least one female member (15, 16) is defined by said interspaces between said ribs (14), the inner surface of said cover members (20, 20') including at least one bulge defining said at least one male member (25, 26).

42. Glass clamp according to the preceding claim, wherein said cover members (20, 20') are made of a metal sheet, said at least one bulge (25, 26) being made by embossing said metal sheet and subsequently folding the latter so that the embossed part lies within the inner part of the cover members (20, 20') faced to the base element (10).

43. Glass clamp according to one or more of the claims 34 to 42, wherein each side surface (11, 11') includes a respective upper edge portion (17, 17') which is opposite to said lower surface (12), said cradle (13) extending between said upper edge portions (17, 17'), each cover member (20, 20') including an inner surfaces (27, 27') having at least one male member (25, 26) substantially perpendicularly projecting therefrom to be snap-fitted engaged in corresponding female slots (15, 16) longitudinally extending along the side surfaces (11, 11') of the base element (10), said each cover member (20, 20') further including a respective hook-shaped portion (29, 29') projecting from said inner surfaces (27, 27') to reciprocally engage with countershaped seats (18, 18') at the respective upper edge portion (17, 17') to rotate thereon between a position distal from the base element (10) in which said at least one male member (25, 26) and the corresponding female slot (15, 16) are reciprocally disengaged and a position proximal thereto in which said at least one male member (25, 26) and the corresponding female slot (15, 16) are reciprocally engaged.

44. A fixing structure for fixing a panel (P), such as a glass panel, which is susceptible to lay over a support surface (S), such as a balcony, a platform, a floor or the like, the fixing structure being in the form of a clamp or a longitudinal rail comprising:

- at least one base element (10) including:
 - a lower surface (12) susceptible to come in reciprocal contact with the support surface (S);
 - a cradle (13) susceptible to seat the panel;
 - two opposite side surfaces (11, 11') substantially perpendicular to said lower surface (12) susceptible to remain at opposite sides with respect to the panel (P) once inserted into the cradle (13);
- means (30) for fixing the panel (P) within said cradle (13);
- at least one couple of cover members (20, 20'), each cover member (20, 20') being susceptible to cover a respective side surface (11, 11');
 - electric supplying means (50);
 - at least one electric device (51) electrically connected thereto,

wherein said cover members (20, 20') and said base element (10) includes means (15, 16; 25, 26) for the reciprocal removable coupling to each other;

wherein each cover member (20, 20') includes an inner surface (27, 27') susceptible to be faced to the

base element (10) and an outer surface (27'', 27''') susceptible to remain exposed, said at least one electric device (51) laying over the outer surface (27'', 27''') of at least one of the cover members (20, 20'), said base element (10) and/or the inner surface (27, 27') of said cover members (20, 20') including a channel (52) extending from the lower surface (12) of the base element (10) and/or the lower edge (23', 23'') of the cover members (20, 20') to allow the passage of said electric supplying means (50) therethrough, an aperture (53) passing through said cover members (20, 20') being provided so as to allow the electric connection of the electric supplying means (50) and said at least one electric device (51).

45. Fixing structure according to the claim 44, wherein said at least one electric device (51) is a solar panel or a LED light.

46. Fixing structure according to claim 44 or 45, wherein said at least one electric device (51) lies on the upper portion (21'', 22'') of said at least one cover member (20, 20').

47. Fixing structure according to any one of claims 44 to 46, wherein upon coupling of said base element (10) and said cover members (20, 20') the latters are inserted on the former and upon the decoupling thereof the cover members (20, 20') are decoupled from the base element (10).

48. Fixing structure according to any one of claims 44 to 47, wherein said removable coupling means (15, 16; 25, 26) are of the snap-fitting type.

49. Fixing structure according to any one of claims 44 to 48, wherein said removable coupling means (15, 16; 25, 26) includes at least one male member (15, 16) and at least one female member (25, 26) reciprocally cooperating to each other, one of said cover members (20, 20') and base element (10) including one of said at least one male and female members (15, 16; 25, 26), the other of said cover members (20, 20') and base element (10) including the other of said at least one male and female members (15, 16; 25, 26).

50. Fixing structure according to the preceding claim, wherein said at least one male member (25, 26) includes or consists of at least one male projection susceptible to be snap-fitted engaged into at least one countershaped seat (15, 16) defining said at least one female member.

51. Fixing structure according to claim 49 or 50, wherein each of said cover members (20, 20') includes a respective at least one male member (25, 26), said base element (10) including said at least one female member (15, 16).

52. Fixing structure according to one or more of the claims 44 to 51, wherein said base element (10) includes a plurality of ribs (14) extending between said side and lower surfaces (11, 11', 12) and said cradle (13), a plurality of hollow interspaces remaining between said ribs (14), said base element (10) being preferably made by extrusion of a metal or plastic material.

53. Fixing structure according to one or more of the claims 44 to 52, wherein at least one of said cover members (20, 20') includes a laminar decorative member (60) removably couplable with the outer surface (27'', 27''') thereof.

54. A fixing structure for fixing a panel (P), such as a glass panel, which is susceptible to lay over a support surface (S), such as a balcony, a platform, a floor or the like, the fixing structure being in the form of a clamp or a longitudinal rail comprising:

- at least one base element (10) including:
 - a lower surface (12) susceptible to come in reciprocal contact with the support surface (S);
 - a cradle (13) susceptible to seat the panel;
 - two opposite side surfaces (11, 11') substantially perpendicular to said lower surface (12) susceptible to remain at opposite sides with respect to the panel (P) once inserted into the cradle (13);
- means (30) for fixing the panel (P) within said cradle (13);
- at least one couple of cover members (20, 20'), each cover member (20, 20') being susceptible to cover a respective side surface (11, 11');

wherein said cover members (20, 20') and said base element (10) includes means (15, 16; 25, 26) for the reciprocal removable coupling to each other;

wherein at least one of said cover members (20, 20') includes a laminar decorative member (60) removably couplable with the outer surface (27'', 27''') thereof.

55. Fixing structure according to claim 54, wherein said at least one of said cover members (20, 20') includes a pivot edge portion (63) and an opposite edge portion (23', 23''; 24', 24''), said laminar decorative member (60) includes an upper and a lower end (61, 62), one of the latter (61, 62) being engageable with said pivot portion (63) to rotate thereon, the other upper or lower end (61, 62) of said laminar decorative member (60) being couplable in a snap-fitting manner on the cover member (20, 20') in correspondence of said opposite edge portion (23', 23''; 24', 24'').

56. Fixing structure according to claim 54 or 55, wherein said pivot portion (63) is defined by the upper edges (24', 24'') of said cover members (20, 20'), the upper end (61) of said laminar decorative member (60) rotating thereon to allow the snap-fitting of said opposite lower end (62) on the lower edge (23', 23'') of the cover members (20, 20').

57. Fixing structure according to claim 54 or 55, wherein said pivot portion (63) is defined by a slot (64) arranged on the outer surface (27'', 27''') of the cover members (20, 20'), the lower end (62) of said laminar decorative member (60) being insertable therein to allow the rotational snap-fitting of the opposite upper end (61) on the upper edge (24', 24'') of the cover members (20, 20').

58. Fixing structure according to the preceding claim, wherein said lower end (62) of said laminar decorative member (60) is a folding portion foldable along a folding line (65), the rotation occurring about said folding line (65).

59. Fixing structure according to one or more of the claims 54 to 58, wherein upon coupling of said base element (10) and said cover members (20, 20') the latters are inserted on the former and upon the decoupling thereof the cover members (20, 20') are decoupled from the base element (10).

60. Fixing structure according to one or more of the claims 54 to 59, wherein said removable coupling means (15, 16; 25, 26) are of the snap-fitting type.

61. Fixing structure according to one or more of the claims 54 to 60, wherein said removable coupling means (15, 16; 25, 26) includes at least one male member (15, 16) and at least one female member

(25, 26) reciprocally cooperating to each other, one of said cover members (20, 20') and base element (10) including one of said at least one male and female members (15, 16; 25, 26), the other of said cover members (20, 20') and base element (10) including the other of said at least one male and female members (15, 16; 25, 26).

5 62. Fixing structure according to the preceding claim, wherein said at least one male member (25, 26) includes or consists of at least one male projection susceptible to be snap-fitted engaged into at least one countershaped seat (15, 16) defining said at least one female member.

10 63. Fixing structure according to claim 61 or 62, wherein each of said cover members (20, 20') includes a respective at least one male member (25, 26), said base element (10) including said at least one female member (15, 16).

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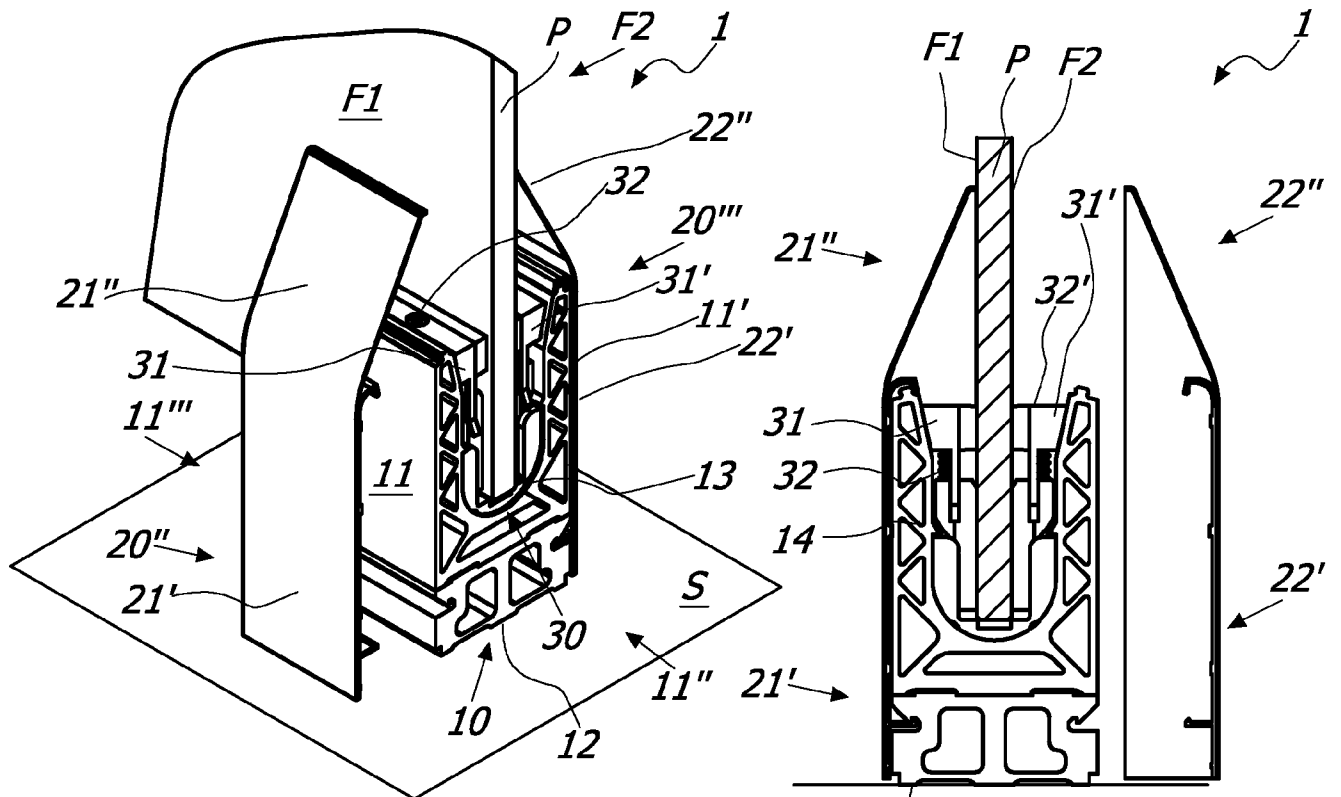


FIG. 1

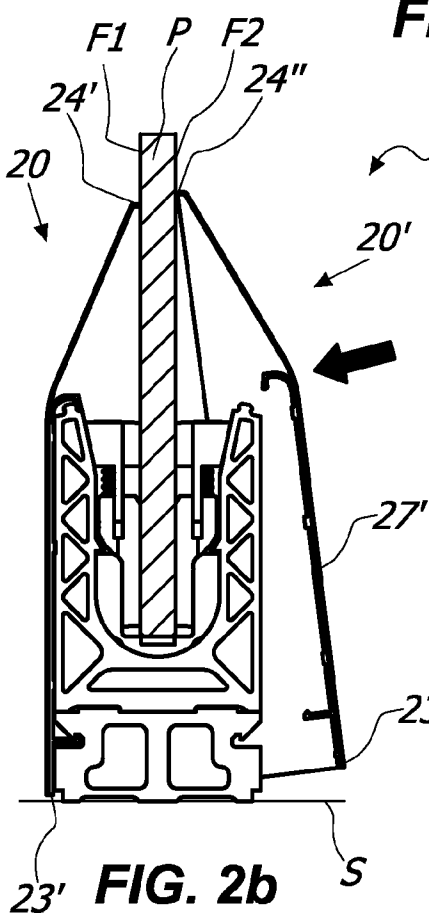


FIG. 2b

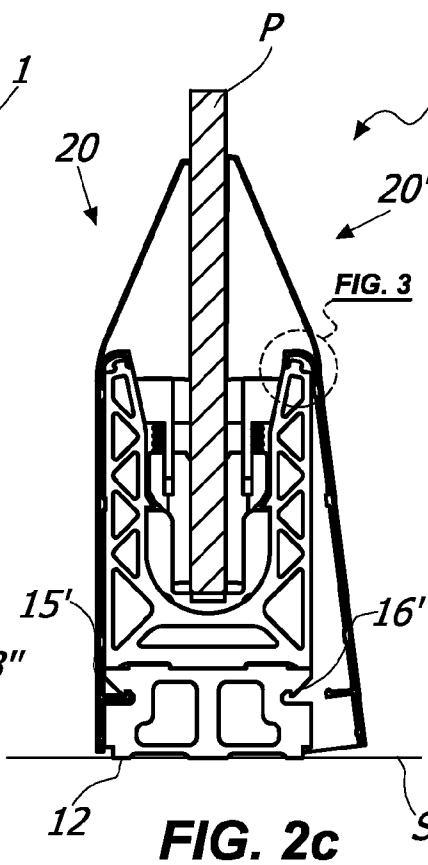


FIG. 2c

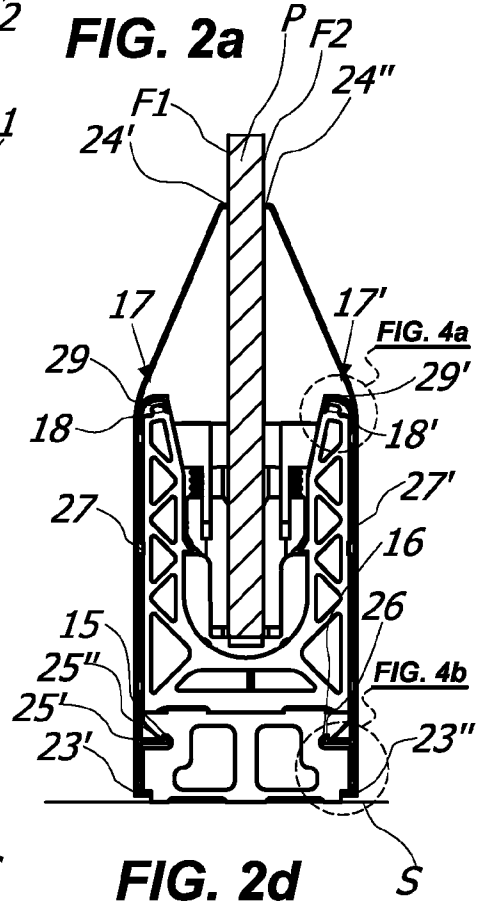


FIG. 2d

FIG. 3

FIG. 4a

FIG. 4b

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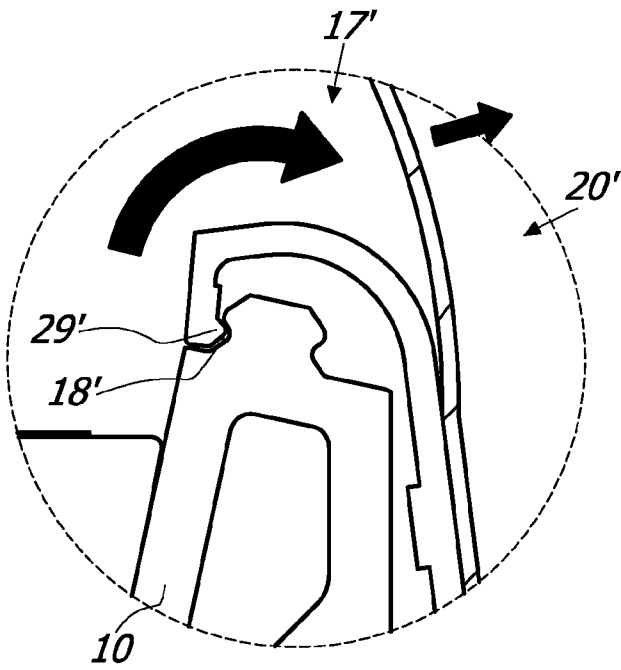


FIG. 3

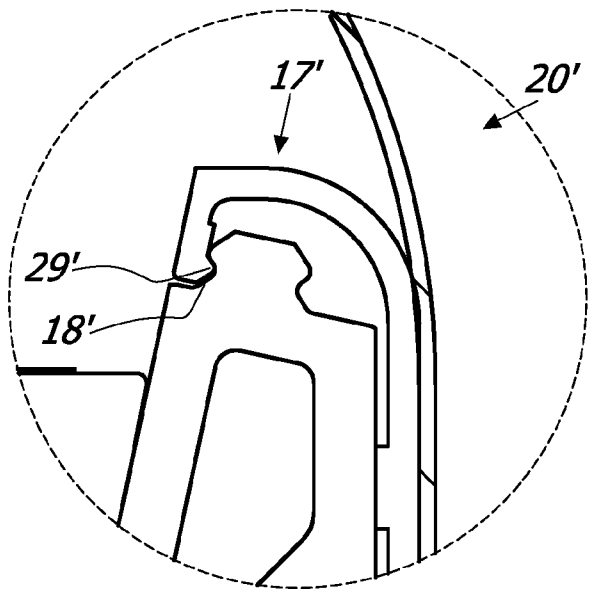


FIG. 4a

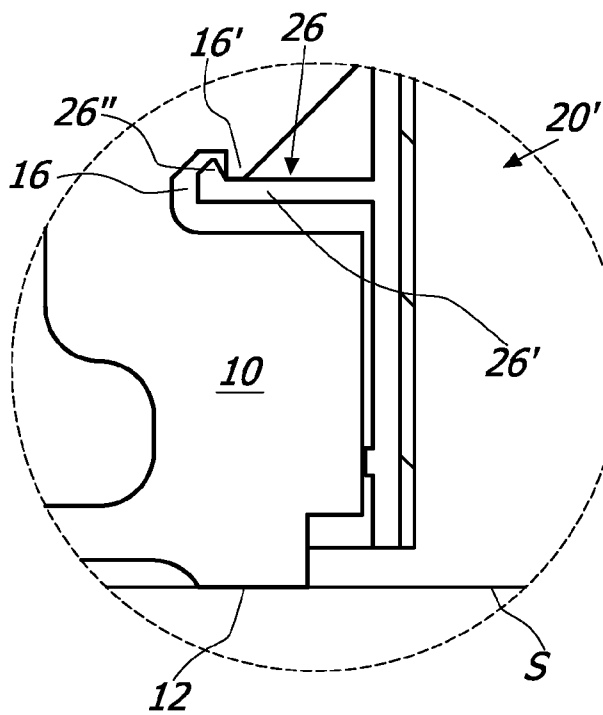


FIG. 4b

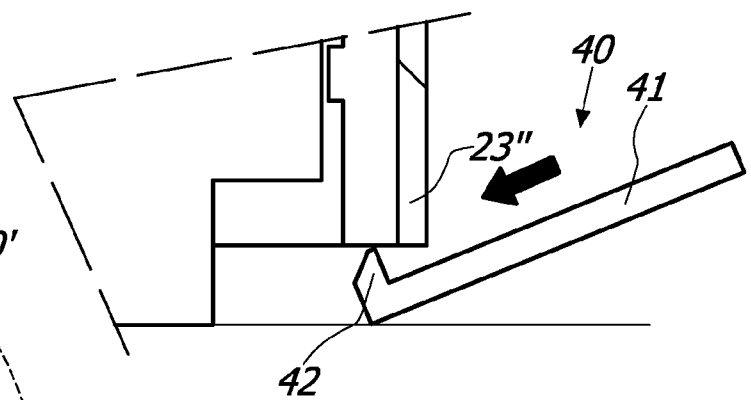


FIG. 5a

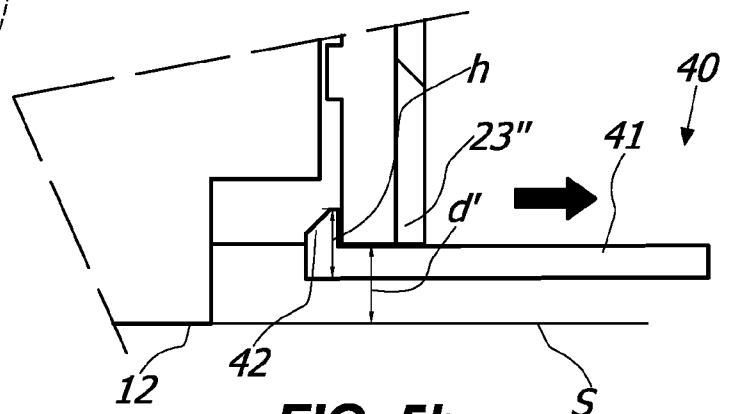


FIG. 5b

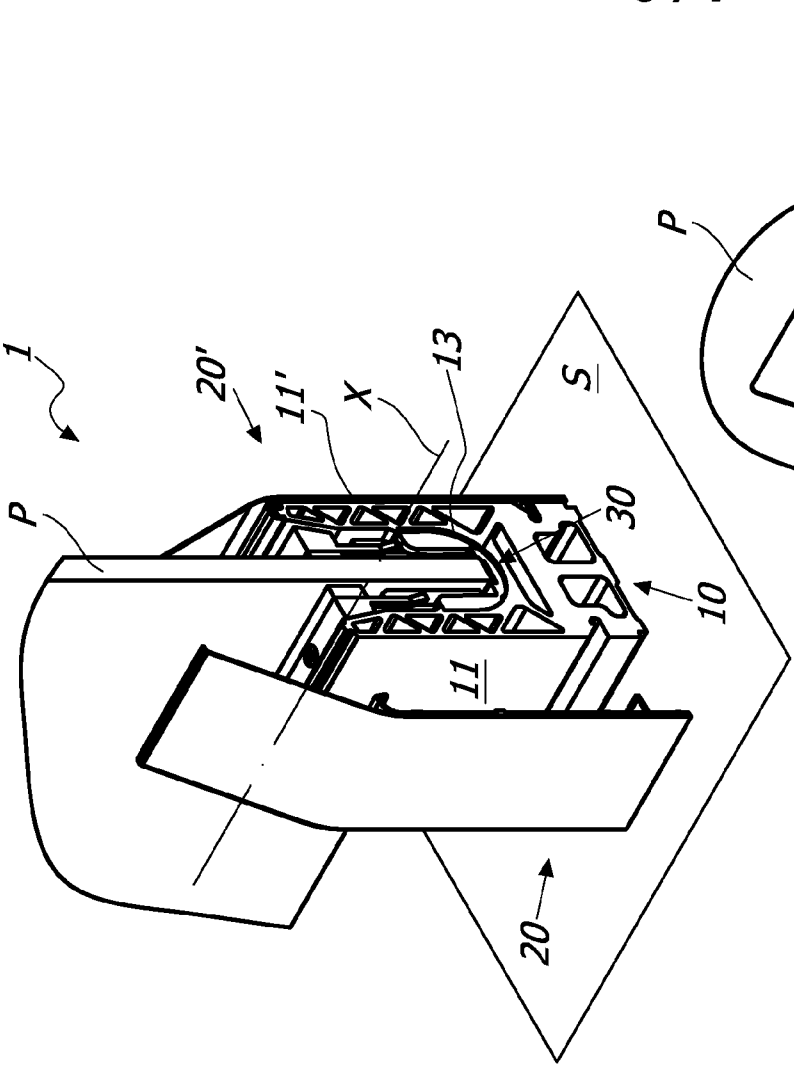


FIG. 6

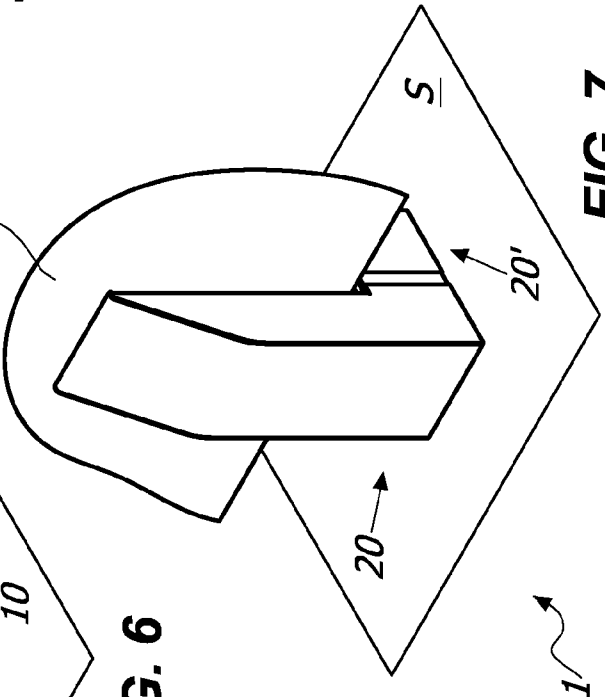


FIG. 7

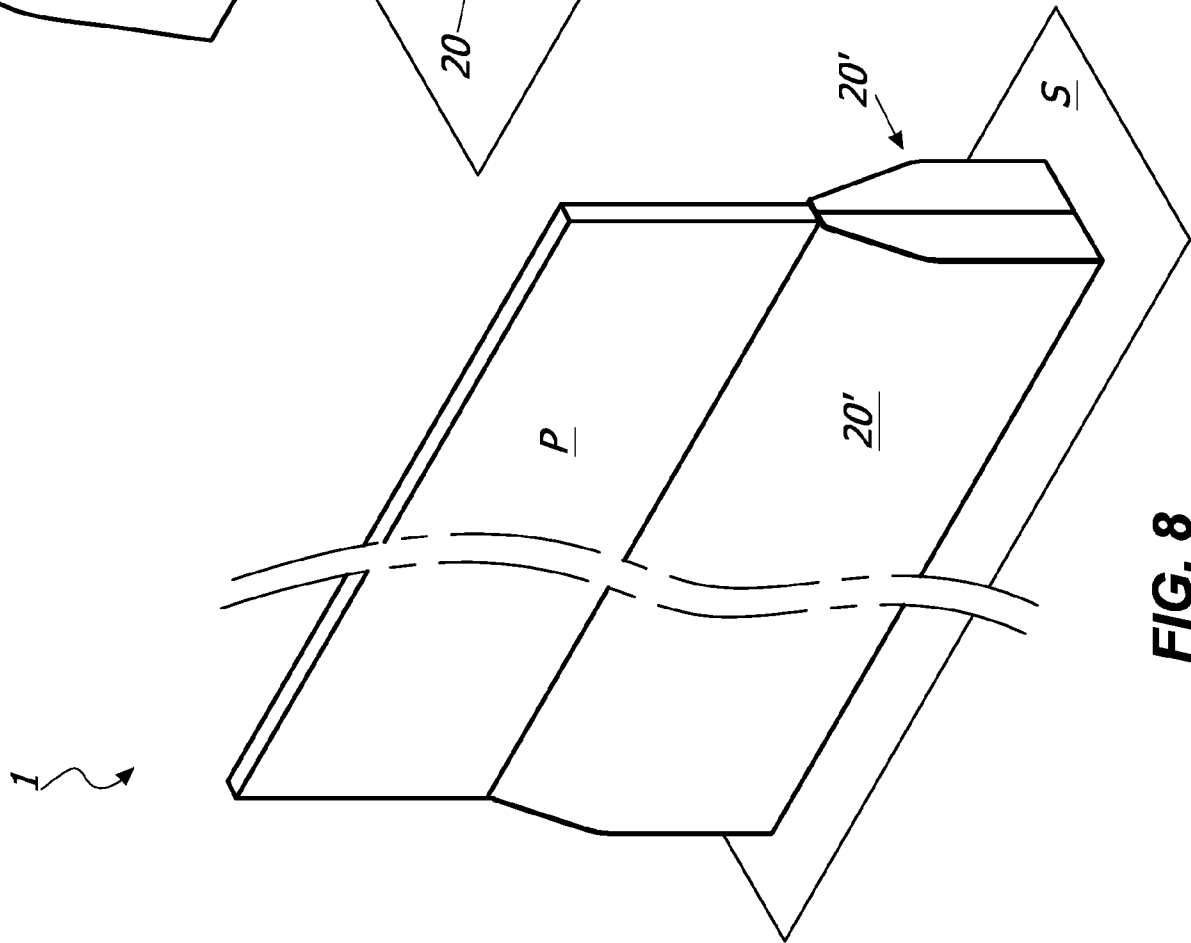
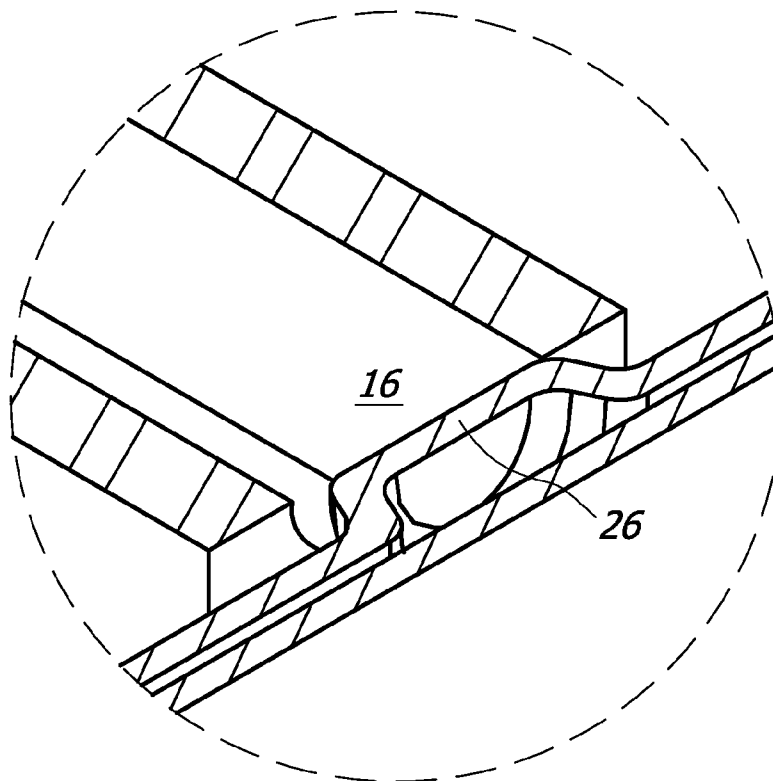
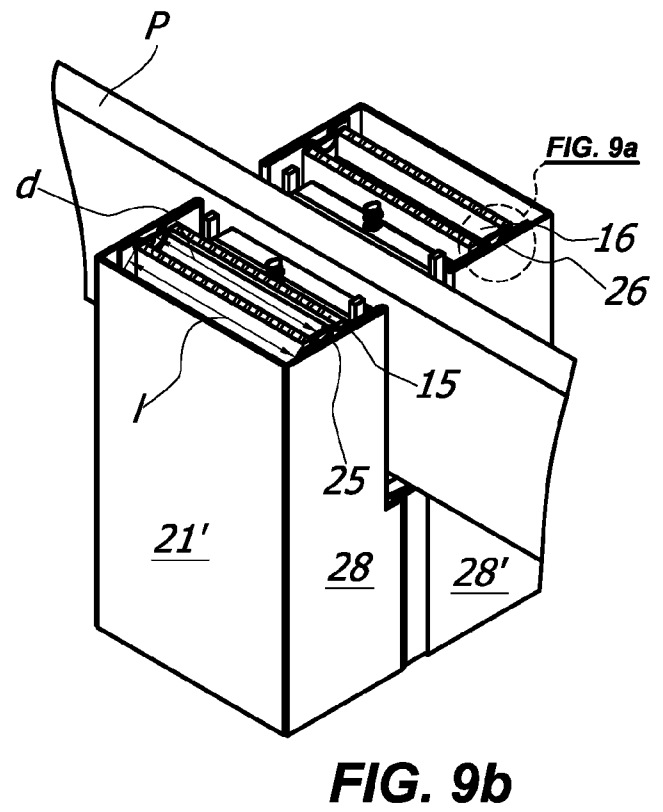
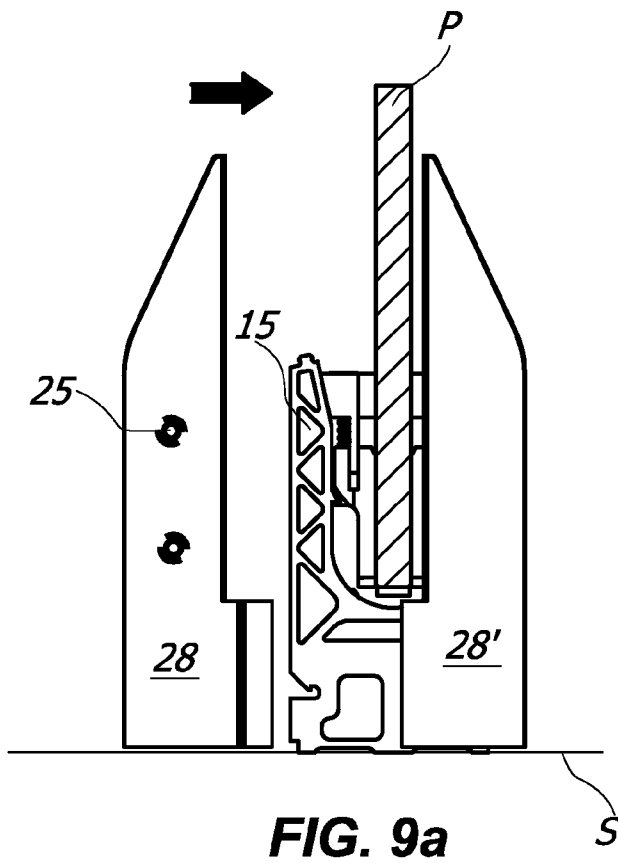


FIG. 8

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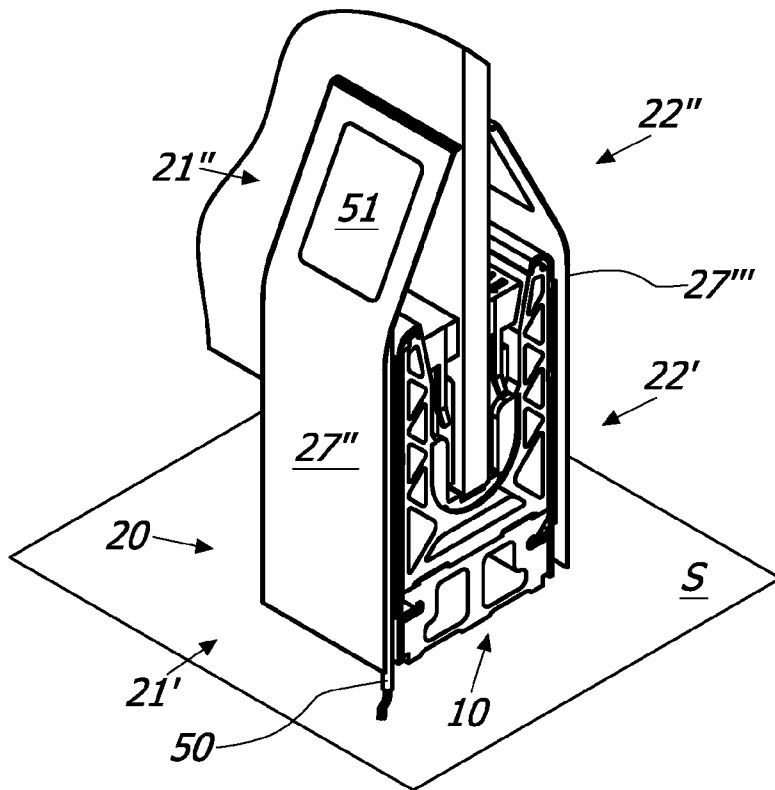


FIG. 10a

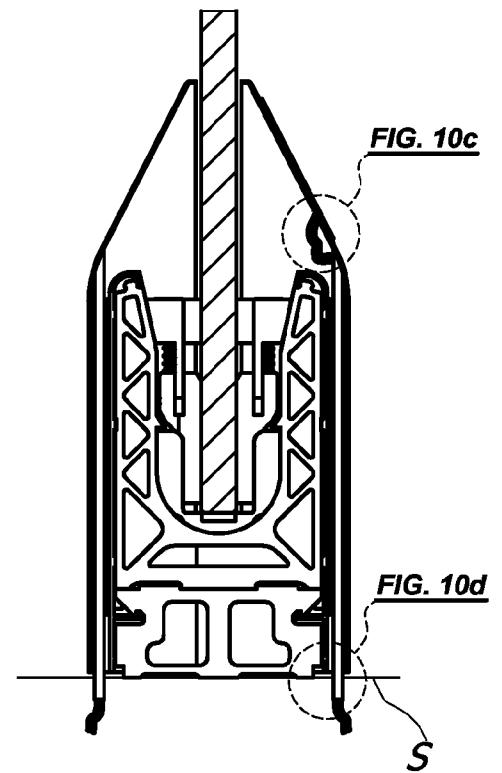


FIG. 10b

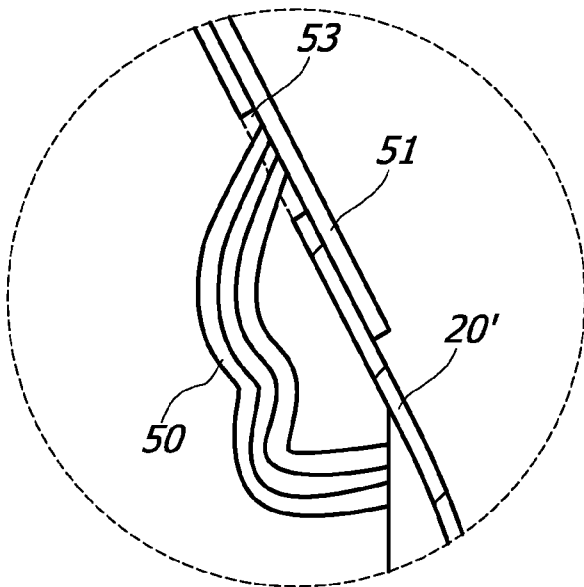


FIG. 10c

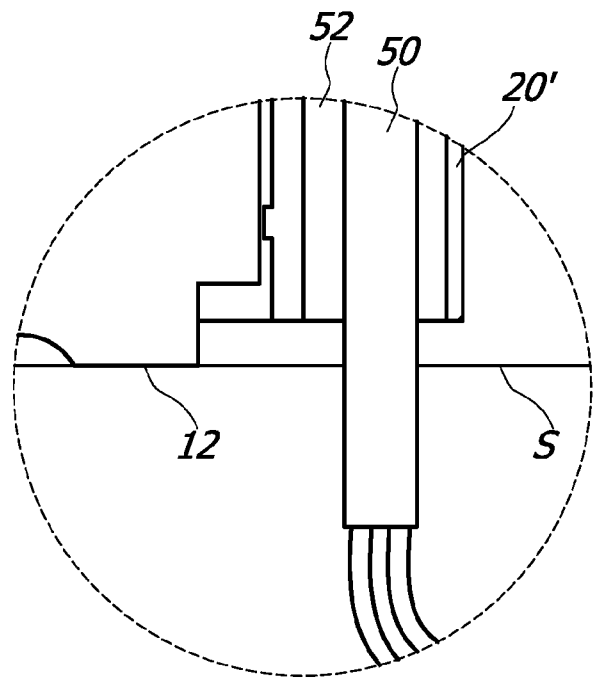


FIG. 10d

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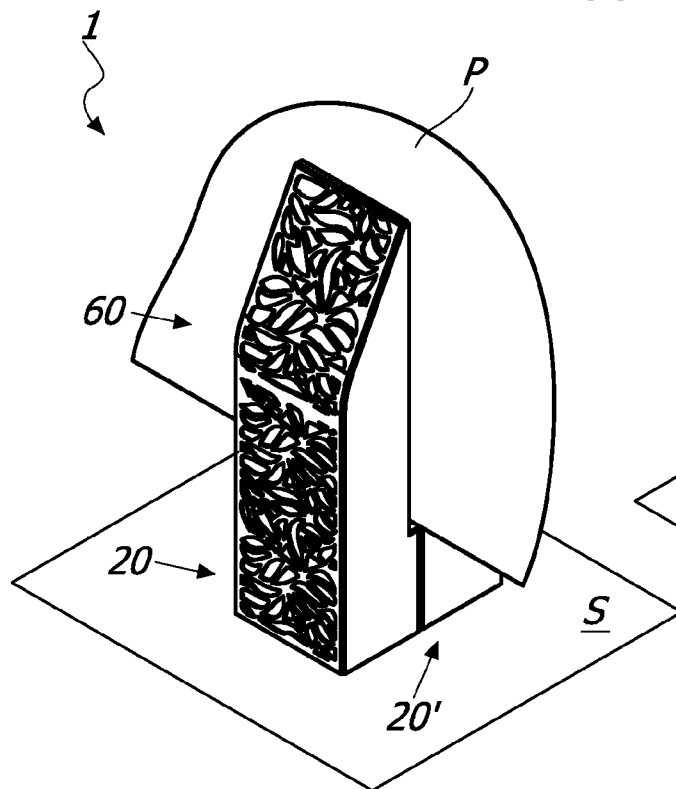


FIG. 11a

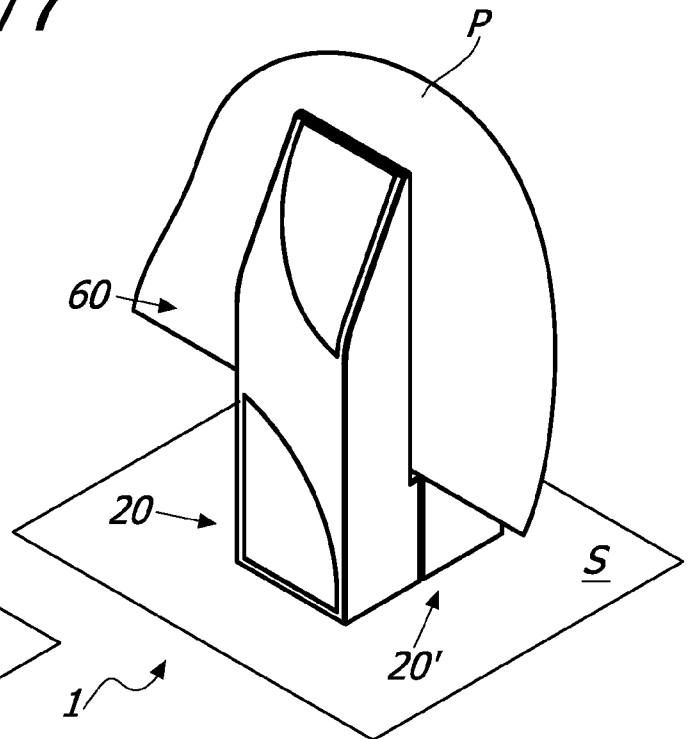


FIG. 11b

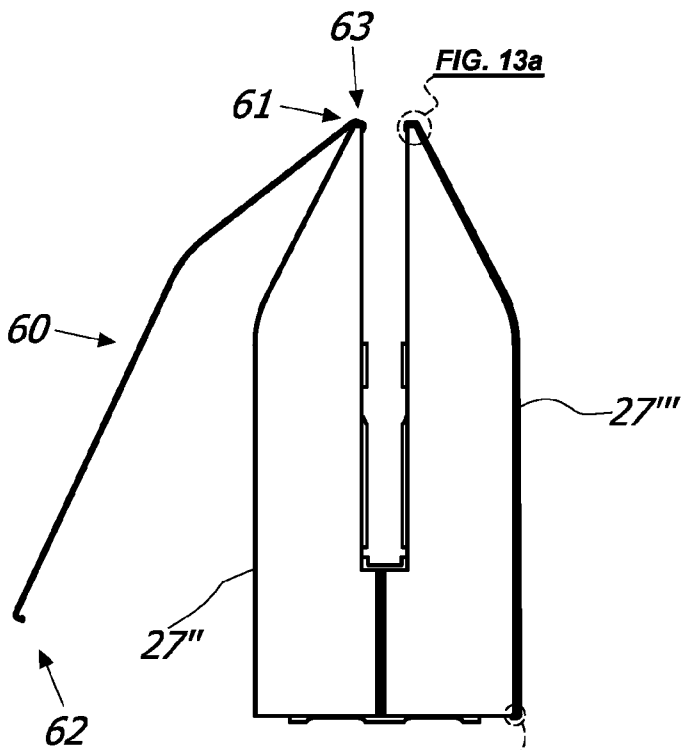


FIG. 12

FIG. 13a

FIG. 13b

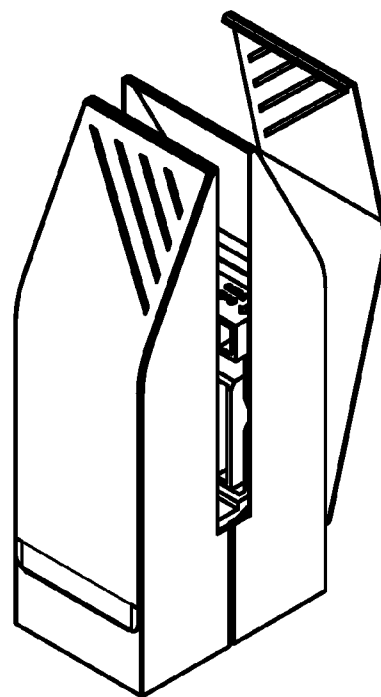


FIG. 14a

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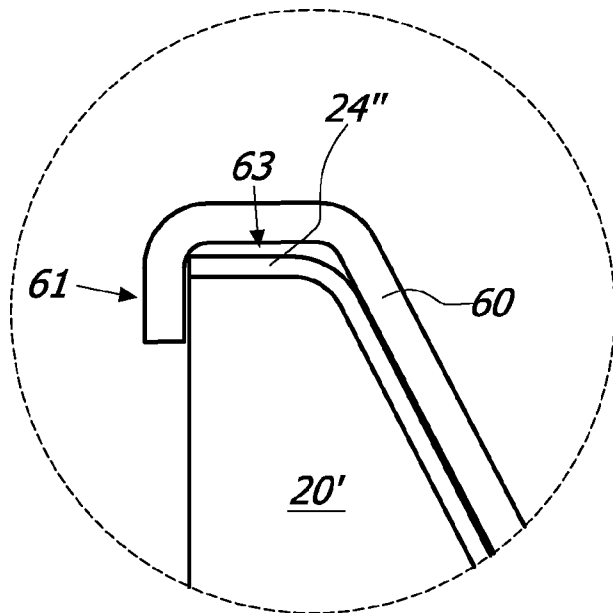


FIG. 13a

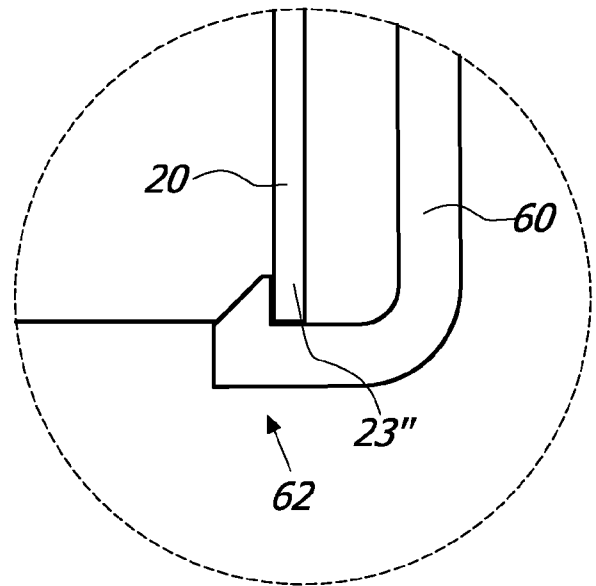


FIG. 13b

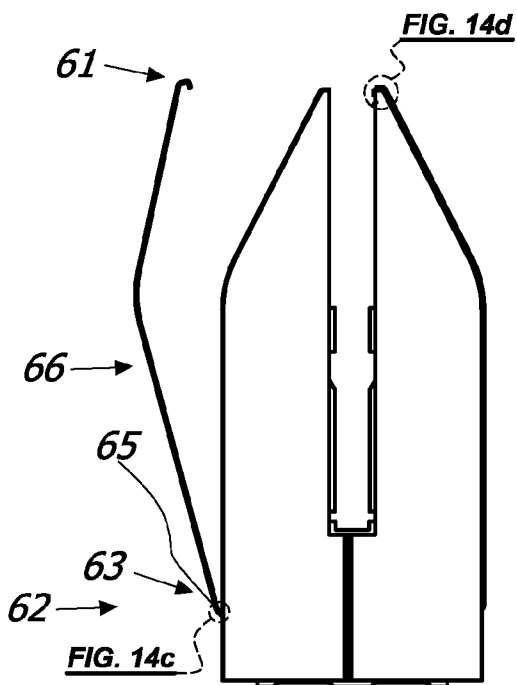


FIG. 14b

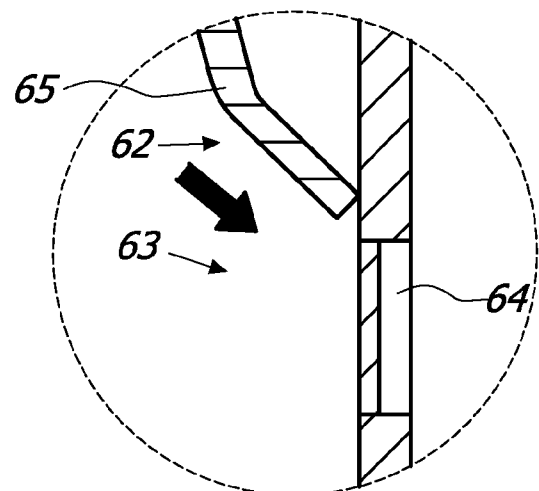


FIG. 14c

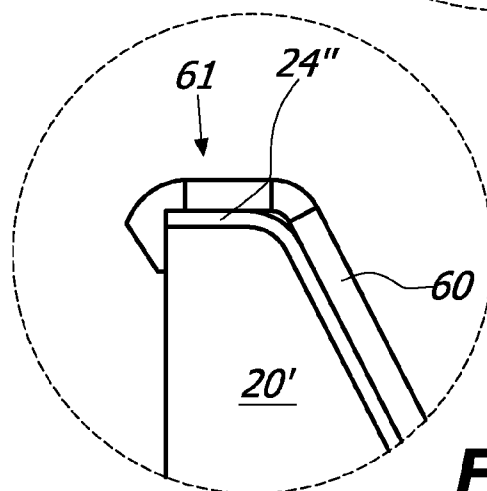


FIG. 14d

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2019/059819

A. CLASSIFICATION OF SUBJECT MATTER

INV. E04F11/18
ADD.

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)

E04F 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 practicable, search terms used)

EP0-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 905 395 A1 (FARAONE S R L [IT]) 12 August 2015 (2015-08-12)	1,2, 7-20, 24-43, 54,59-63
A	paragraphs [0015] - [0018], [0023], [0040], [0046], [0047] figures 1-3	3-6, 21-23, 44-53, 55-58
X	----- WO 2018/111208 A1 (SAKAR BURAK [TR]) 21 June 2018 (2018-06-21)	1,2, 7-20, 24-43, 54,59-63
A	page 4, lines 9-16,41-42 page 6, line 44 - line 45 figures 1-2 ----- -/-	3-6, 21-23, 44-53, 55-58

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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

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"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

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Date of the actual completion of the international search

4 February 2020

Date of mailing of the international search report

24/02/2020

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Authorized officer

Arsac England, Sally

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2019/059819

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	paragraphs [0002], [0021], [0024], [0025], [0027], [0031] figures 1,6,7	3-6, 12-16, 21-23, 27-29, 34-53, 55-58
A	----- WO 2018/075952 A1 (LAURENCE C R CO INC [US]) 26 April 2018 (2018-04-26) paragraphs [0027], [0049] figures 1-4	1-63
A	----- US 2017/292274 A1 (DOWNS KEVIN [US]) 12 October 2017 (2017-10-12) paragraphs [0035], [0036], [0039], [0063] figures 1-4	1-63
A	----- GB 2 436 717 A (JURALCO ALUMINIUM BUILDING PRO [NZ]) 3 October 2007 (2007-10-03) page 6, line 9 - line 20 page 7, line 7 - line 20 figures 1-3	1-63
A	----- DE 20 2012 103568 U1 (SISUKAS OUE [EE]) 12 November 2012 (2012-11-12) paragraphs [0019], [0024], [0027] figures 5-7 -----	44-53

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2019/059819

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