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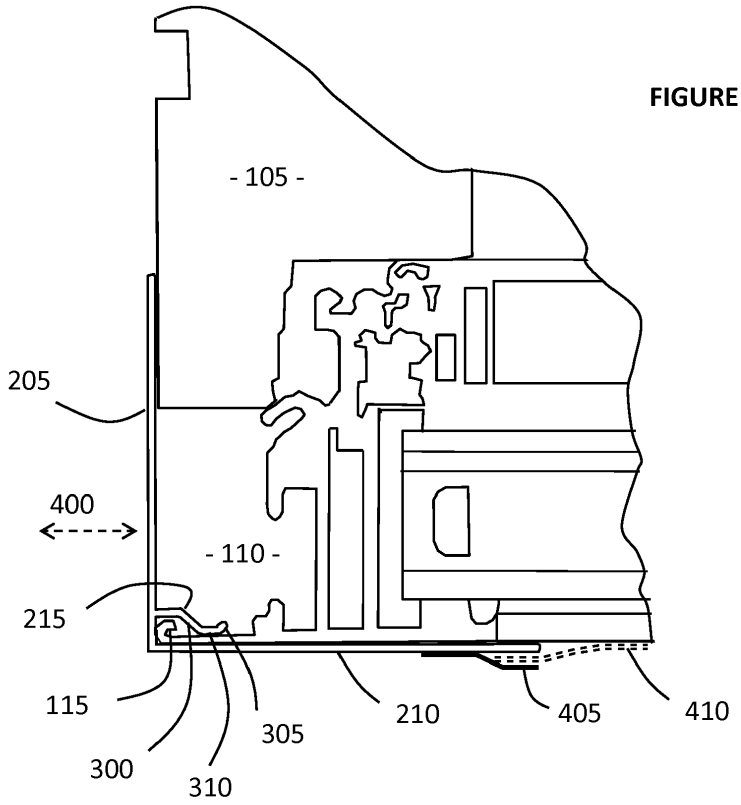
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(54) **CONSTRUCTION PANEL CORNER SHIELD**

(57) A shield for a building panel is designed to clip to a frame of the panel that will be visible in the finished building, to protect the frame during installation. The shield is particularly suitable for a composite window of known type having an aluminium external frame and a wood internal frame in the finished building. The shield has a pair of angled flanges and a clip that sits inside the elbow formed by the angled flanges. The clip is used to install the shield on the external frame, a first flange then protecting a cavity and/or devices in the side of the frame and a second flange then protecting a surface of the frame that will be visible in the finished building.

FIGURE 4



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Description

[0001] The present invention relates to construction panel packaging and finds particular application in packaging windows, glass wall panels, skylights and similar components having a frame.

[0002] It is known in current day construction to use at least partially prefabricated windows or panels having a frame that keys into the adjoining wall construction by means of its cross section. The frame for example might be of wood and aluminium. The building is first constructed in panels which are made waterproof by the installation of the doors, windows and sometimes other glazed panels. External brickwork is constructed afterwards, adjacent the frame of these glazed panels.

[0003] It is important that the frame isn't damaged so that it can't be used or is unsightly. However, there is a significant probability of damage occurring for example during transport, after delivery to a construction site and/or during installation. In addition to direct damage to the frame, aluminium is very easily marked and there can be problems with mortar, render or site debris entering the profile of the frame and affecting mechanisms such as hinges and closers. The frame usually presents a continuous surface which is visible around the window once installed, but the sides can be hollow or concave, housing the mechanisms, and opening laterally towards the wall construction. The mortar, render or site debris can then enter through the sides of the frame during construction.

[0004] Known forms of protection for such frames include packaging blocks and panels for protection in transport. These however have to be secured in some way and of course have to be removed before the frames are installed, in which case the frames are vulnerable to damage during the building process. Tapes can be used, either low tack or high tack, and foils or plastic sheeting can also be taped on even over large areas. However, the low tack tapes come off quite easily while in the case of many current frames, such as those made of aluminium, the tapes can mark or otherwise damage them. Damage of that type isn't acceptable as repairs are expensive and can be litigious, particularly where a multimillion pound development is concerned.

[0005] According to embodiments of the present invention in a first aspect, there is provided a shield for a construction panel, the shield comprising at least two flanges angled with respect to one another, the shield further having an inner resilient clip for clipping onto the panel, the clip presenting a sliding surface for sliding release of the shield under a force in a release direction.

[0006] A shield according to an embodiment of the invention has multiple advantages. It can be used to attach tapes without marking a panel or frame it is protecting. It can optionally be left in place not only for transport and/or onsite handling but also during construction work. That is, embodiments of the invention can be left protecting a panel, such as the frame of a window, during installation in a building and even until the brick skin of a building has been constructed (invaluable protection) and still then be removed. This can prevent debris and mortar getting into cavities of the panel, particularly the frame of a window, during the building process as well as preserving a pristine visual condition.

[0007] The angled flanges will usually each protect part of the panel in use. For example, a first flange might extend over a cavity and/or at least one working mechanism along the outer edge of the panel, this preventing debris and the like from entering the cavity, or damage to the working mechanism, during construction. An example is a composite window frame having a timber internal frame and an aluminium external frame, these generally presenting a cavity between them. A second flange might extend, usually but not necessarily at right angles to the first, at least partially over a surface of the frame that will be visible in the finished building. The second flange can protect that visible surface during installation and one or both of the flanges can provide a surface for the attachment of tape for a further protective layer.

[0008] Preferably, the clip is mounted on the first flange and the release direction is lateral with respect to the panel. This means that there is no requirement for any feature of the panel to cooperate with the clip that might be visible in the finished construction, after the shield has been removed. This takes advantage of building techniques in which there remains a gap or channel between a panel, such as a window, and a skin of the building, for instance a brick skin. The channel only has to be as wide as the length of the clip in order to be able to move the clip off the panel in a lateral direction and thus remove the shield.

[0009] Neither flange is necessarily flat in cross section. The second flange will however usually match the shape of the surface of the frame that will be visible so as to sit against it and provide maximum protection.

[0010] The clip can be mounted in the region where the two flanges meet, the second flange cooperating with the clip to grip an edge of the panel. The resilient clip might simply grip a flat edge of the panel or frame when the shield is in use but it has been noted that a significant proportion of frames such as window frames present a rolled or folded edge. The clip can be designed to seat over this rolled or folded edge, extending beyond it in cross section so as to hold the rolled edge between the sliding surface and the second flange. Pressure in a release direction can then simply slide the rolled edge out from the resilient clip. In cross section, the sliding surface of the clip may present an inclined surface relative to the second flange, the rolled edge being held in a wider part of the space defined by the sliding surface and the second flange and pressure in the release direction acting to open a narrower part of that space so as to let the rolled edge pass out of the clip. The rolled or folded edge affords a good purchase for the shield on the frame while still

allowing the shield to be removed in a simple manner.

[0011] There might be several discrete clips provided along the shield but more preferably the shield might have a continuous clip cross section along it. The latter version can be produced by extrusion and has more strength than separate, discrete clips along the shield.

[0012] Once the framed construction panel has been installed, and optionally after further building work such as construction of a brick skin up to the frame, the shield can be removed by pushing it in a release direction of the clip. The sliding surface of the clip can be given a dimension in the release direction allowing the shield to be moved far enough to secure release. Typically, for example, a brick skin might leave a gap of 20mm to the frame. As long as the clip can be released by a movement of no more than 20mm, the shield can generally be removed. Thus the dimension of the clip in the release direction is preferably no more than 20mm and will usually be less, such as around 15mm. Depending on the dimensions of the rolled or folded edge, the dimension might be less again, such as in the range 10-12mm.

[0013] Conveniently the whole shield might be made of resilient material such as recycled plastic or polyvinylchloride (PVC). It might be manufactured by any suitable technique such as extrusion or perhaps 3D printing.

[0014] To mount the shield on a panel or frame to be protected, it can either be slid onto the frame telescopically, so that an end of the frame enters an open end of the clip, or it can be pushed on in a direction opposite to the release direction.

[0015] An embodiment of the invention might comprise a set of shields for installation on a panel or frame, the set providing continuous protection around the panel or frame when assembled on it. The clips of the set will then extend inwardly with regard to the installed set, each towards a far side of the installed set.

[0016] According to embodiments of the present invention in a second aspect, there is provided a method of installing a shield as described above, onto an edge of a construction panel, the method comprising inserting the edge between the clip and the second flange such that the first flange protects a side of the panel and the second flange protects a front surface of the panel when installed in a building.

[0017] A shield according to an embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 shows a horizontal cross section through a double glazed window panel ready for installation;
Figure 2 shows a perspective view of the shield;
Figure 3 shows a horizontal cross section through the shield of Figure 2 at enlarged scale;
Figure 4 shows a horizontal cross section of the shield of Figure 2 installed to protect the frame of the window panel of Figure 1;
Figure 5 shows a horizontal cross section of the shield and window panel of Figure 4, installed in a building together with a subsequent brick skin; and
Figures 6A and 6B show variants in cross section of a clip of the shield of Figure 2.

[0018] It should be noted that the figures are not drawn to scale.

[0019] Referring to Figure 1, an example of a window type that can benefit from use of an embodiment of the invention is known as a composite window in that the glazing 100 has an outer frame made of two parts, a timber internal frame 105 and an aluminium external frame 125. It is extremely difficult to protect windows of this type on site as it is not possible to apply a high (or low) tack tape to either of the two frame surfaces 105, 125 as it can stain them. Further, there is a cavity 110 defined between the timber internal frame 105 and the aluminium external frame 125 which is well-adapted to capture debris from a building site or during installation, such as rubble, mortar and render. Tape cannot be applied directly to either frame 105, 125 without a risk of damage or marking and thus protective coverings are difficult to secure.

[0020] The cavity 110 is formed between a front-facing edge strip 120 of the aluminium external frame 125 and the timber internal frame 105. The front-facing edge strip 120 is visible in the finished building construction, sitting at or near the external surface of the building. The timber internal frame 105 is also visible in the finished building construction but on the inside. Notably in the embodiment shown in Figure 1, there is a small rolled edge 115 to the front-facing edge strip 120, at the outermost point of the composite window. This is a common type of construction which is not essential for use with embodiments of the invention but can improve the performance.

[0021] Referring to Figure 2, a shield 200 according to an embodiment of the invention is designed to clip to the aluminium external frame 125. The shield 200 can then optionally be used to tape on a protective layer of known type for the whole composite window or for any part of it. However, the shield itself is highly protective. It has first and second angled flanges 205, 210, these being angled with respect to one another to provide a side flange 205 and a front flange 210. A clip 215 runs inside the elbow formed by the angled flanges 205, 210, being attached along the side flange 205 but close to the front flange 210.

[0022] As shown in Figure 2, both flanges 205, 210 are planar but one or both could equally well be curved or have another shape to fit the composite window. The two flanges may indeed blend into one another rather than meeting at

an angle. The shape is however limited by the protection required from each flange for the composite window and by the need to remove the shield 200 once the window is installed. This is further discussed below.

[0023] Referring to Figures 2 and 3, the clip 215 comprises a short further flange bent to approach the front flange 210 and away from it again so as to form a gripping device for anything pushed between it and the front flange 210. The material of the clip 215 is resilient, for example the whole shield 200 may be made of recycled plastics material, or PVC, and the shape facing the front flange 210 provides two sliding surfaces 300, 305 for pushing an edge of the composite window into the clip 215 and for pulling the clip 215 free of it again. These surfaces 300, 305 are slanted in a symmetrical manner with respect to the front flange 210, forming between them a gripping projection 310 and each surface 300, 305 opening in a direction away from the projection 310 so as to receive and release anything pushed into the clip 215 in a smooth manner. The cross section of the space between the clip 215 and the front flange 210 can be described as having a neck where the gripping projection 310 approaches the front flange 210.

[0024] It might be noted that Figure 2 shows a break out portion 220 of the clip 215, defined by a cut line. This is an example of a potential modification of the shield 200 to accommodate for example a hinge of the composite window. Figure 3 further shows a small cut line 320, such as a score mark, that runs across the side flange 205. This allows the width of side flange 205 bridging the cavity 110 to be selectively reduced to allow use of sealant tape if required.

[0025] Referring to Figure 4, the shield 200 is installed onto a composite window by engaging the clip 215 over the edge 115 of the front-facing edge strip 120 of the aluminium external frame 125. Normally, four shields would be installed, one for each side of the aluminium external frame 125 including the top and the bottom as installed in a building. The two sliding surfaces 300, 305, enable the edge 115 to be moved into and out of the clip 215 by movement of the shield 200 in a lateral direction 400 with respect to the window as shown, or a vertical direction in the case of shields 200 installed to the top and bottom of the window. If the edge 115 is a rolled or folded edge 115, this can significantly improve the stability of the shield 200 when installed.

[0026] Figure 4 also shows a clear film 410 protecting the glazing 100 of the window, this having been secured, using high tack tape 405, to the front flange 210 of the shield 200.

[0027] Once the shield 200 and protected window are installed in a partially constructed building, the side flange 205 extends from the edge 115 of the aluminium external frame 125, rearwards of the window face and into the wall construction. The front flange 210 seats across the visible face of the aluminium external frame 125.

[0028] Referring to Figure 5, a next stage in the building construction may be to apply a brick skin 500 to the front of the building. During this process, without the shield 200 it is very likely that mortar for example will find its way into the cavity 110. This can be a problem because the working mechanisms of a composite window of the type shown are external. That is for example hinges, stays and closers. If mortar or render attaches to these working mechanisms, they can malfunction. However, only a narrow gap A-A is left between the brick skin 500 and the composite window, for example of the order of 20mm. In order to remove the shield 200, it is necessary to move it across the gap A-A so as to release the clip 215. The dimension B-B of the clip 215 in the release direction 400 is necessarily no more than that of the gap A-A. For example, it might be up to 18mm.

[0029] It will be noted that the release direction 400 as shown is generally parallel to the plane of the glazing 100 of the window but it could be affected by the shape of the external aluminium frame 125 of the window. If the frame 125 is curved for example, the front flange 210 might follow that curve and the release direction 400 of the clip 215 may be no longer following the plane of the glazing 100. The release direction 400 will generally however have at least a significant component parallel to the plane of the glazing 100.

[0030] In a specific example, the dimensions of the shield prior to installation are:

- Dimension B-B of the clip 215 in the release direction: 11.00mm
- Width of side flange 205 bridging the cavity 110: 59.00mm
- Aperture from clip projection 310 to front flange 210: 1.79mm
- Width of the front flange 210 protecting aluminium: 57.00mm

[0031] The aluminium frame 125 of a typical composite window is 2mm thick. Thus when the shield 200 is installed, the clip 215 is opened slightly, this providing an amount of tension which retains the shield 200 in place. The dimensions can clearly be varied, particularly to fit different frames 125 or windows. However, it has been found that these dimensions are appropriate for a polyester powder coated, painted, aluminium frame 125 of 2mm thickness. A PVC shield 200 will not then mark the frame 125 as the material is not strong enough to scuff the powder coating. There is negligible force placed on the aluminium frame 125 as the aperture or gap between the clip projection 310 and the front flange 210 prior to installation is already 1.79mm and the aluminium is only 2mm thick so the spring clip 215 only has to open up by a further 0.21mm when mounted on the aluminium section 125. In general, it has been found that the clip 215 should have a gap between 9% - 11% smaller than the thickness of the material it grips (that is, the front flange 210) in order to have enough compression to stay in place but be loose enough so as not to cause scuff marks.

[0032] The gap described above is particular to use of the shield 200 on a specified type of powder coated, aluminium frame 125. The clip 215 might in practice be found acceptable with a wider range of gap size, such as for example between 5% - 20% smaller than the thickness of the material it grips. For the same reason, the dimensions of the clip might also be changed.

[0033] Referring to Figure 6A and 6B, variations in the shape of the clip 215 might be for example that it has only one sliding surface 300 for release of the edge 115 (Figure 6A) or that it extends further from the side flange 205 than as described above (Figure 6B). In the first case, the shield can be installed by sliding it telescopically onto an end of the aluminium external frame 125, so running the edge 115 into the clip 215. This variation has only one sliding surface 300, for removal of the shield, but could be more difficult to install.

Claims

1. A shield for a building panel, the shield comprising at least first and second flanges angled with respect to one another, the shield further having an inner resilient clip for clipping the shield onto the panel, the clip presenting a sliding surface for sliding release of the shield under a force in a release direction.

2. A shield according to claim 1, wherein, in use, the first flange extends over a cavity and/or at least one working mechanism along the outer edge of the panel to prevent debris and the like from entering the cavity, or damage to the mechanism, during building construction using the panel.

3. A shield according to either preceding claim, wherein the clip is mounted on the first flange and the release direction is lateral with respect to the panel.

4. A shield according to any preceding claim wherein the clip is attached to the shield in the region where the first and second flanges meet, the second flange cooperating, in use, with the clip to grip an edge of the panel.

5. A shield according to any preceding claim, wherein, in use, the second flange extends at least partially over a surface of the panel that will be visible in the finished building.

6. A shield according to any preceding claim, wherein the sliding surface comprises an inclined surface relative to the second flange, the clip and second flange defining a space in cross section which has a neck adjacent to the inclined surface for gripping an edge portion of the panel.

7. A shield according to claim 6, for use with a panel provided with a thickened edge, this thickened edge being held in use of the shield in a wide part of the space in cross section, pressure in the release direction acting to open the neck so as to let the thickened edge pass out of the clip.

8. A shield according to either of claims 6 or 7, wherein the neck for gripping an edge portion of the panel is dimensioned such that the neck, when relaxed prior to use on a panel, provides a gap which is 5% - 20%, and preferably 9% - 11%, smaller than the thickness of that edge portion.

9. A shield according to any preceding claim, wherein the inner resilient clip extends substantially along the whole length of the shield.

10. A shield according to any preceding claim, wherein the dimension of the clip in the release direction is no more than 20mm, for example no more than 15mm, or lies in the range 10-12mm.

11. A shield according to any preceding claim, comprising a plastic material or polyvinylchloride (PVC).

12. A shield according to any preceding claim wherein the building panel comprises a frame and the inner resilient clip is configured for clipping the shield onto an edge of the frame.

13. A set of shields according to any preceding claim, for installation on a building panel, the set providing continuous protection around the panel when installed on it.

14. A building panel having clipped onto it at least one shield according to any of the preceding claims.

15. A composite window having an internal frame and an external frame relative to its use in a building, the window having clipped onto it at least one shield according to any of the preceding claims.

16. A method of installing a shield according to any of claims 1 to 12, onto an edge of a building panel, the method comprising inserting the edge between the clip and the second flange such that the first flange protects a side of the panel and the second flange protects a front surface of the panel when installed in a building.

FIGURE 1

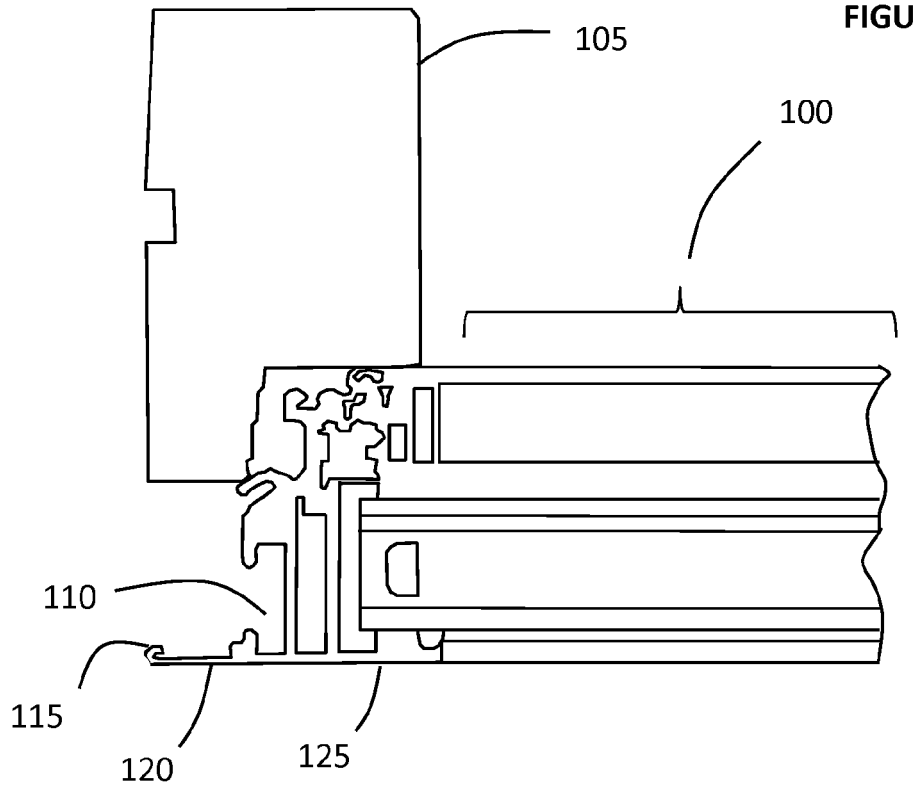


FIGURE 2

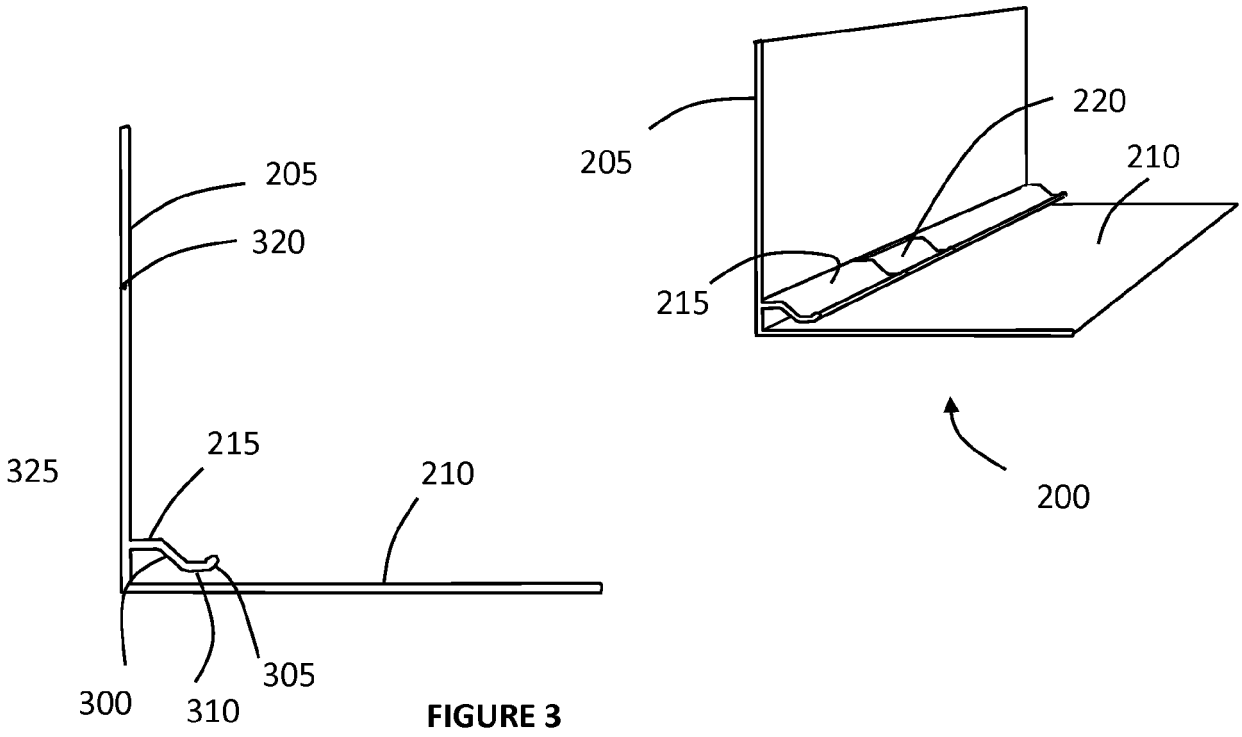


FIGURE 3

FIGURE 4

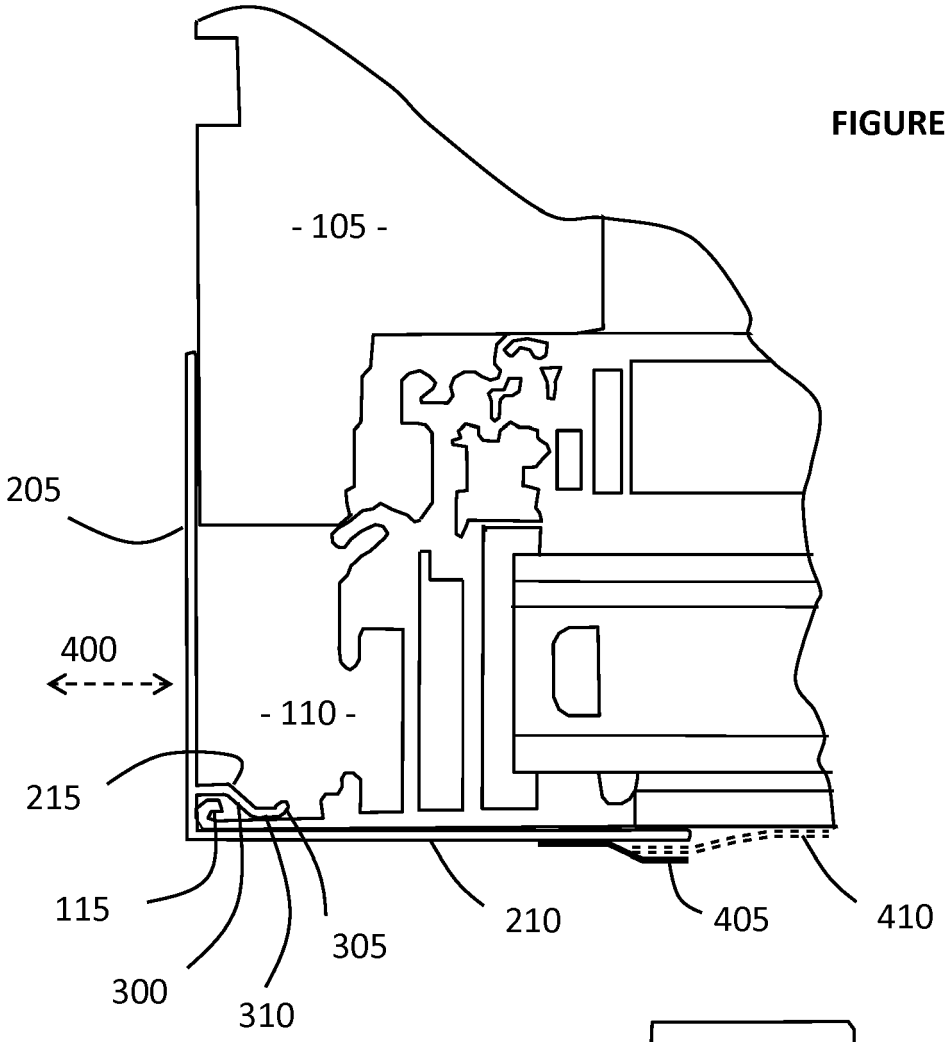


FIGURE 5

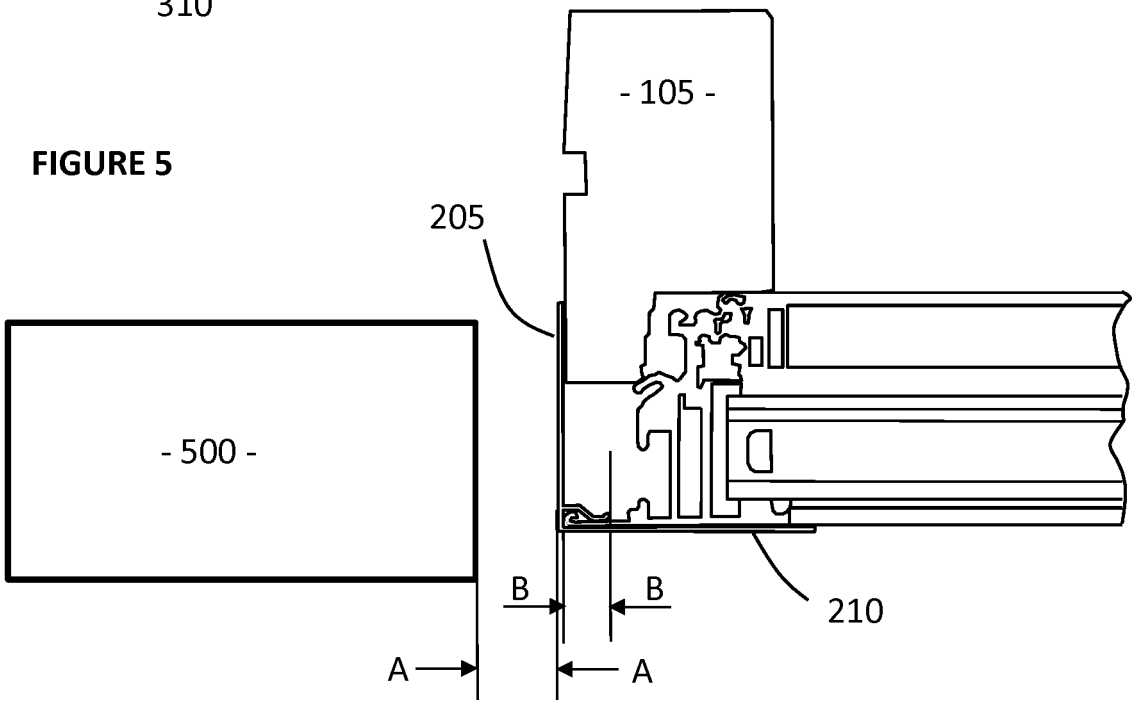


FIGURE 6A

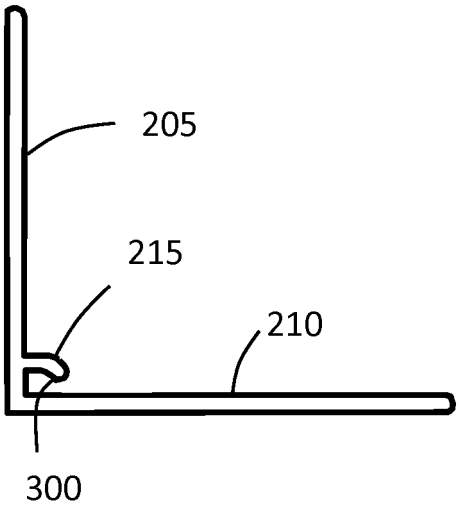
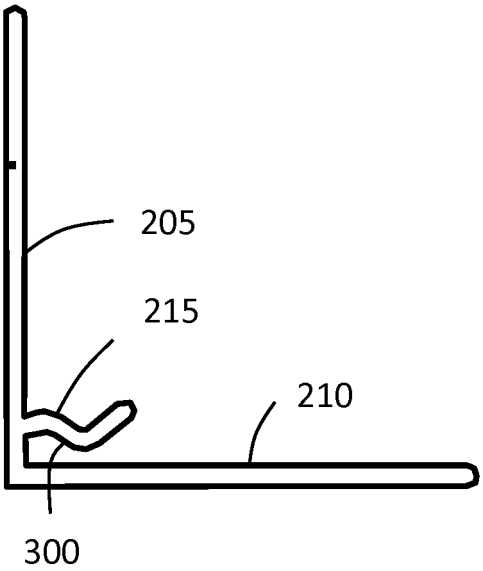


FIGURE 6B



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EUROPEAN SEARCH REPORT

Application Number
EP 16 02 0426

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

E04G
B65D
E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 February 2017	Garmendia Irizar, A

CATEGORY OF CITED DOCUMENTS

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