

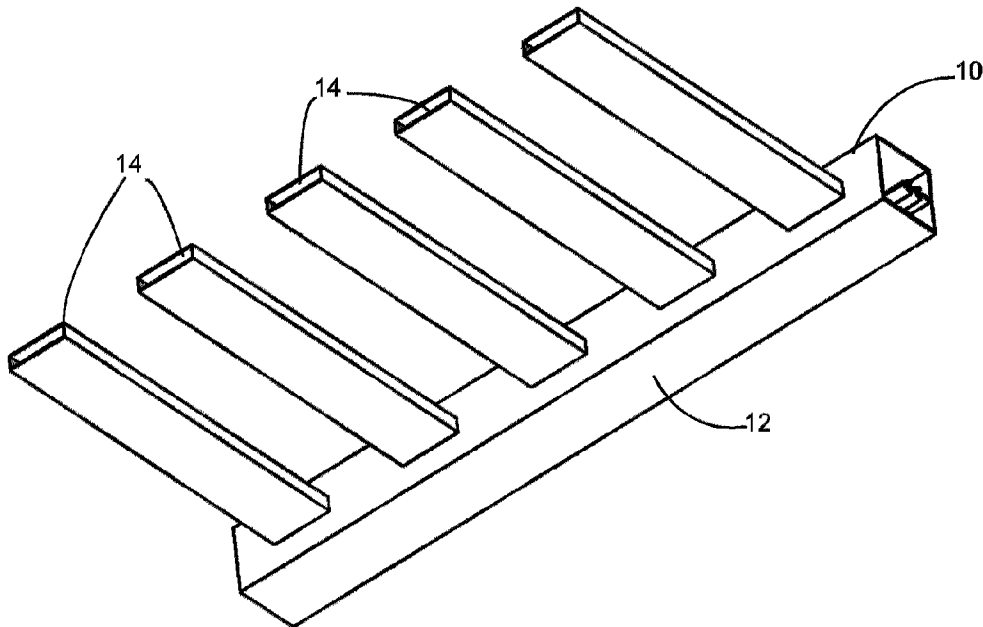


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(54) **Titre : SYSTEMES ET ELEMENTS DE PANNEAU**
(54) **Title: PANEL SYSTEMS AND COMPONENTS**



(57) **Abrégé/Abstract:**

In one preferred form there is provided a panel mount (10). The panel mount (10) comprises an elongate body (14) having a plurality of openings (16) spaced along the elongate body (14). In the panel mount (10) a mount (18) is located opposite each opening (16) for being received by a panel member (20) extending through the opening (16). Each mount (18) is configured for engaging at least one inner surface (22) of the panel member (20) to apply an engaging force that is directed laterally outwardly, relative to the panel member (20), when the panel member (20) extends through the opening and engages the mount (18).

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ABSTRACT

In one preferred form there is provided a panel mount (10). The panel mount (10) comprises an elongate body (14) having a plurality of openings (16) spaced along the elongate body (14). In the panel mount (10) a mount (18) is located opposite each opening (16) for being received by a panel member (20) extending through the opening (16). Each mount (18) is configured for engaging at least one inner surface (22) of the panel member (20) to apply an engaging force that is directed laterally outwardly, relative to the panel member (20), when the panel member (20) extends through the opening and engages the mount (18).

PANEL SYSTEMS AND COMPONENTS

Field of the Invention

[0001] The present invention relates to panel systems such as fences, gates and balustrades.

Background to the Invention

[0002] Panel systems for are used for a variety of screening purposes, including fences, gates, balustrades and the like. Such panel systems generally incorporate a frame having an upper frame member and a lower frame member, with panels or slats extending between the frame members in order to complete the panel system.

[0003] Often, panels are fixed with fasteners such as screws or rivets. There are several problems associated with this. Generally, each panel must be independently fastened into position, which is a time consuming process. If there is any problem in alignment of panels with fixing holes then damage to the panel is likely. In addition, during the life of the panel system it is common for fasteners to become loose, leading to rattling of panels or even the loss of panels from the system.

[0004] Other known methods of fixing panels involve some sort of clamping or other frictional engagement with the outside of a panel. This fixing will often cause scratching or other damage to the outside of the panel, making the panel unable to be reused. Damage to visible portions of the outside of the panel can occur during a mistake in assembly, making it common for damage to be visible in the final assembled product.

[0005] It is against this background that the present invention has been developed.

Summary of the Invention

[0006] According to one aspect of the present invention there is provided a panel assembly comprising a frame member and a plurality of panels, each

panel having a corresponding fastening element for connecting the panel to the frame member, the frame member having a mating portion; the panels being elongate and being at least partially hollow, the panels having internal walls; the fastening element having a frame engaging portion arranged to engage with the mating portion of the frame member and a panel engaging portion arranged to engage with the internal walls of a panel, wherein the panel engaging portion is arranged to provide a frictional force between the fastening element and the internal walls of a panel in order to impede relative movement of the fastening element and the panel.

[0007] The panel assembly may be a screen such as a fence, a gate, or a balustrade.

[0008] It is preferred that the panel engaging portion acts against the panel along a line generally perpendicular to a longitudinal direction of the panel.

[0009] In a preferred embodiment the fastening element comprises a central body portion, and the panel engaging portion comprises at least two bearing members which extend laterally of the central body portion. The bearing members may be flanges each having an elongate outer edge arranged to bear against an internal wall of the panel.

[0010] The mating portion of the frame member may be comprised of longitudinally extending rails, with the frame engaging portion of the fastening element being complementary in shape to an upper edge of the longitudinally extending rails.

[0011] It is preferred that the longitudinally extending rails include internally facing clip portions located on the upper edges thereof, and the fastening element includes outwardly facing clip portions forming the frame engaging portion.

[0012] The frame member may include a plurality of openings along one edge thereof, each opening arranged to receive a fastening element therein.

[0013] In accordance with a second aspect of the present invention there is provided a fastening element for connecting a panel to a frame member, the fastening element having a frame engaging portion arranged to engage with the mating portion of the frame member and a panel engaging portion arranged to engage with the internal walls of the panel, wherein the panel engaging portion is arranged to provide a frictional force between the fastening element and the internal walls of the panel in order to impede relative movement of the fastening element and the panel.

[0014] A fastening element may comprise a central body portion, and the panel engaging portion may comprise at least two bearing members which extend laterally of the central body portion. Preferably, the central body portion is a web.

[0015] The bearing members may be flanges each having an elongate outer edge arranged to bear against an internal wall of the panel.

[0016] It is preferred that the fastening element includes outwardly facing clip portions forming the frame engaging portion.

[0017] The fastening element preferably has a substantially constant cross section along its length. In a preferred embodiment, the fastening element can be formed as an extrusion cut into desired lengths.

Brief Description of the Drawings

[0018] The present invention will be better understood in connection with the following Figures, in which:

[0019] Figure 1 is a perspective view of a portion of a panel assembly in accordance with at least one embodiment of the present invention;

[0020] Figure 2 is an end view of a frame member of the panel assembly of Figure 1;

[0021] Figure 3 is a perspective view of elements of a panel assembly in accordance with at least one embodiment of the present invention;

[0022] Figure 4 is a close up view of an end of a frame member from the panel assembly of Figure 3;

[0023] Figure 5 is a perspective view of a fastening element from the panel assembly of Figure 3;

[0024] Figure 6 is an end view of the fastening element of Figure 5;

[0025] Figure 7 is an upper perspective view of the fastening element of Figure 5;

[0026] Figure 8 is an end view of the frame member of Figure 4;

[0027] Figure 9 is a series of cross-sectional views of alternative frame members and fastening elements for panel assemblies similar to that of Figure 3;

[0028] Figure 10 is a series of cross-sectional views of further alternative frame members for use in panel assemblies in accordance with the present invention;

[0029] Figure 11 is a perspective of a frame member in accordance with at least one embodiment of the present invention;

[0030] Figure 12 is a perspective view of a panel for use in conjunction with the frame member of Figure 11;

[0031] Figure 13 is a perspective view of a fastening element for use with the frame member of Figure 11;

[0032] Figure 14 is a perspective view of a fastening element in accordance with at least one embodiment of the present invention; and

[0033] Figure 15 is a perspective view of a frame member in accordance with at least one embodiment of the present invention.

Detailed Description of Preferred Embodiments

[0034] Referring to the Figures, Figure 1 shows a portion of a panel assembly 10. The panel assembly 10 includes a lower frame member 12, from which a plurality of panels 14 extend. It will be appreciated that the panel assembly 10 can be completed by an upper frame member being a mirror image of the lower frame member 12.

[0035] The lower frame 12 can be seen in Figure 2. It is elongate, having a generally square cross section. Rectangular apertures 16 are spaced along its upper surface, each sized to receive a panel 14.

[0036] A plurality of integrally formed fastening elements 18 are spaced along a lower surface of the lower frame 12, corresponding with each rectangular aperture 16. The fastening elements 18 are arranged to engage with an internal surface of a corresponding panel 14, as will be described in greater detail below.

[0037] Figures 3 to 8 show a preferred panel assembly 20. The panel assembly 20 includes a frame member 22, together with panels similar to the panels 14 and an upper frame similar to the frame member 22. The principle difference between the panel assembly 20 of Figures 3 to 8 and the panel assembly 10 of Figures 1 and 2 is that the panel assembly 20 includes a plurality of distinct fastening elements 24.

[0038] Each frame member 22 is generally rectangular in cross section, with the frame member 22 having an upper edge 26, a lower edge 28, and two side edges 30. The upper edge 26 includes a plurality of rectangular apertures 32 spaced along its length, sized and shaped to receive hollow panels (not shown) with a small clearance about each panel.

[0039] The lower edge 28 of the frame member 22 has a mating portion 34 extending along an internal surface thereof, oriented towards the upper edge 26. The mating portion 34 comprises two longitudinally rails 36, spaced apart from each other. Each of the rails 36 in this embodiment is comprises of an upwardly projecting wall 38 parallel to the side walls 20 of the frame 12, the wall 38 having an elongate indent 40 on an internal side thereof.

[0040] A fastening element 24 can be seen in detail in Figures 5 to 8. The fastening element 24 has a central body portion 42 from which two parts extend: a frame engaging portion 44 at a lower end of the central body portion 42 and a panel engaging portion 46 at an upper end of the central body portion 42. The central body portion 42 is formed as a web which extends along the length of the fastening element 24.

[0041] The frame engaging portion 44 is formed as two L-shaped legs which extend from a lower end of the central body portion 22. The frame engaging portion 44 has two side walls 48 which are parallel to the central body portion 22, and spaced from each other. The arrangement is that the side walls 48 are spaced from each other by the same distance as the spacing between the rails 36 of the frame member 22.

[0042] The side walls 48 each have an outwardly facing protrusion 50 at a lower end thereof. The protrusion 50 is formed as an elongate 'kink' at lower end of each side wall 48. The arrangement is such that when a fastening element 24 is lowered onto a mating portion 34 of the frame member 22, the side walls 48 of the frame engaging portion 44 flex inwardly as the walls 38 of the rails 36 flex outwardly, allowing the fastening element 24 to move downward until the protrusions 50 of the fastening element 24 locate within the indents 40 of the mating portion 34. It will be appreciated that this works in practice as a 'click' into place function.

[0043] The panel engaging portion 46 comprises flanges 52 which extend away from the central body portion 42 at a downwards angle of about 30 degrees. In the embodiment of the drawings there are two flanges 52 on each

side of the central body portion 42, although it will be appreciated that the number of flanges on each side can be readily varied. Each flange 52 has an elongate outer edge 54 which is parallel to the protrusions 50.

[0044] The flanges 50 are sized such that when a panel is located around the fastening element 24, the flanges 50 will bear against an internal wall of the panel 50 and provide a frictional force between the fastening element 24 and the panel 50. It will be appreciated that the frictional force will act in a line generally parallel to the longitudinal direction of the frame member 22; that is, perpendicular to a longitudinal direction of the panel.

[0045] The fastening element 24 is of uniform cross-sectional shape. In a preferred embodiment of the invention, the fastening element is formed by aluminium extrusion which is cut to form fastening elements 24 of a required length.

[0046] The length of each fastening element 24 is set to be slightly less than the width of a panel. This means that each fastening element 24 is sized to be receivable through an aperture 32 in the frame member 22.

[0047] In order to form a panel assembly, a fastening element 24 is introduced into each aperture 32 of both an upper frame member 22 and a lower frame member 22. The fastening elements 24 are each clicked into place over the mating portion 34 of the relevant frame member. A panel can then be inserted into each aperture 32 of the lower frame member 22, around the panel engaging portion 46 of the respective fastening element 24. The panel can be slid into its final position relative to the lower frame member 22, being held in position by frictional engagement between the flanges 50 and the internal wall of the panel.

[0048] Once all of the panels have been located in the lower frame member 22, the upper frame member 22 can be located appropriately opposed to the lower frame member 22 and slid into position whereby its fastening elements 24 engage with the panels and hold them in position.

[0049] It will be appreciated that various elements of the panel assembly described above can be altered without departing from the scope of the invention. For instance, it is necessary that the shape of the mating portion 34 of the frame member 22 is complementary to that of frame engaging portion 44 of the fastening element 24. The particular shape of these complementary portions can readily be varied. Figure 9 shows a number of possible variations of the shape of this connection. Other variations are equally possible.

[0050] Similarly, although the panel assembly described above uses rails 36 which extend from the lower edge 28 of the frame member 22, it will be readily apparent that other locations for the mating portion 34 are also possible. Figure 10 shows a number of possible variations of the location and shape of the mating portion 34. Other variations are, of course, possible.

[0051] The assembly described above results in a panel assembly broadly similar in shape to the panel assembly 10 of Figure 1, with rectangular panels 14 arrayed along the length of the frame member 12. An alternative shape is shown in Figure 11 to 13, wherein the panels 60 are curved in shape and the apertures 32(a) in the frame member 22(a) are shaped to receive this curved shape. The curved panels 60 are formed with two parallel internal walls 62 which is arranged to engage with the panel engaging portions 46(a) of the fastening elements 24(a).

[0052] It will be appreciated that the depth of the panels used can be readily altered with corresponding changes to the size of the fastening member 24, such as shown in the fastening member 24(b) of Figure 14.

[0053] Similarly, the width of the panels, and their spacing, can be altered with corresponding changes to the apertures 32, such as the closer spacing of apertures 32(c) in frame member 22(c) of Figure 15.

[0054] Other modifications and variations as would be apparent to a skilled addressee are deemed to be within the scope of the present invention.

Claims

1. A panel assembly comprising at least one frame member and a plurality of panels, each panel having a corresponding fastening element for connecting the panel to the frame member, the frame member having a plurality of openings spaced along one edge thereof, each panel fitting into one of the plurality of openings, the frame member having a mating portion oriented towards the said edge; the panels being elongate and being at least partially hollow, the panels having internal walls; the fastening element having a frame engaging portion arranged to engage with the mating portion of the frame member and a panel engaging portion arranged to engage with the internal walls of a panel, the fastening element being sized such that the frame engaging portion is arranged to be inserted through one of the openings, wherein the panel engaging portion is arranged to provide a frictional force between the fastening element and the internal walls of a panel in order to impede relative movement of the fastening element and the panel.
2. The panel assembly as claimed in claim 1, wherein the panel engaging portion acts against the panel along a line generally perpendicular to a longitudinal direction of the panel.
3. The panel assembly as claimed in claim 1 or claim 2, wherein each fastening element includes a central body portion and the panel engaging portion comprises two bearing members which extend laterally of the central body portion.
4. The panel assembly as claimed in claim 3, wherein the bearing members are flanges each having an elongate outer edge arranged to bear against an internal wall of the panel.
5. The panel assembly as claimed in any one of claims 1 to 4, wherein the mating portion of the frame member is comprised of longitudinally extending rails.
6. The panel assembly as claimed in claim 5, wherein the frame engaging portion of the fastening element is complementary in shape to an upper edge of the longitudinally extending rails.

7. The panel assembly as claimed in claim 6, wherein the longitudinally extending rails include internally facing clip portions located on the upper edges thereof.
8. The panel assembly as claimed in claim 7, wherein the fastening element includes outwardly facing clip portions forming the frame engaging portion.
9. The panel assembly as claimed in any one of claims 1 to 8, wherein the panel assembly is a fence, a gate, or a balustrade.
10. A fastening element when used for connecting a panel to a frame member, the fastening element having a frame engaging portion arranged to engage with a mating portion of the frame member, the frame engaging portion extending in a longitudinal direction, and a panel engaging portion arranged to engage with the internal walls of the panel, the panel engaging portion extending in the longitudinal direction, the panel engaging portion being arranged to provide a frictional force between the fastening element and internal walls of the panel in order to impede relative movement of the fastening element and the panel, wherein the fastening element has a substantially constant cross section in its longitudinal direction.
11. The fastening element as claimed in claim 10, wherein the fastening element includes a central body portion and the panel engaging portion comprises two bearing members which extend laterally of the central body portion.
12. The fastening element as claimed in claim 11, wherein the central body portion is a web.
13. The fastening element as claimed in claim 11 or 12, wherein the bearing members are flanges each having an elongate outer edge arranged to bear against an internal wall of the panel.

14. The fastening element as claimed in any one of claims 11 to 13, wherein the fastening element includes outwardly facing clip portions forming the frame engaging portion.

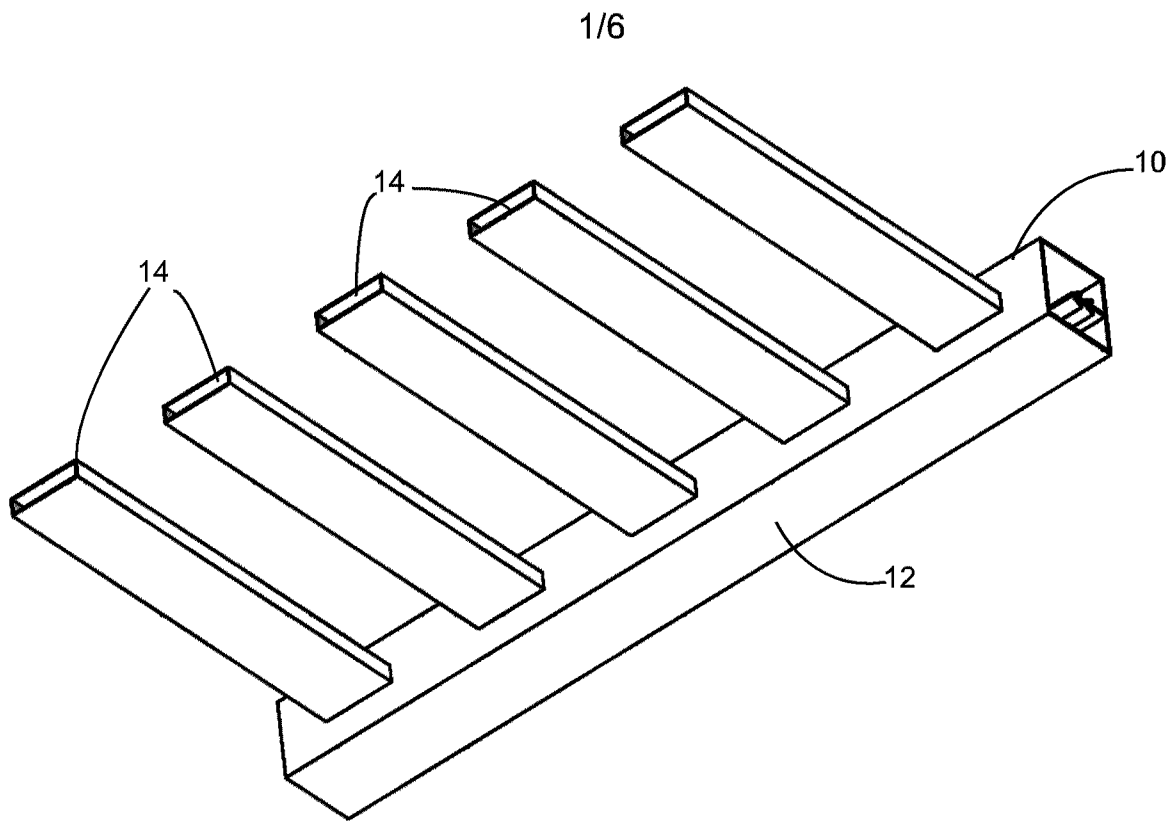


Fig. 1

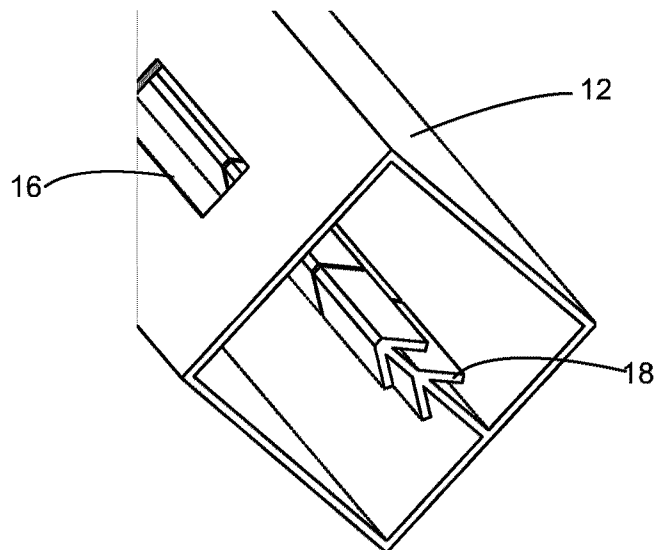
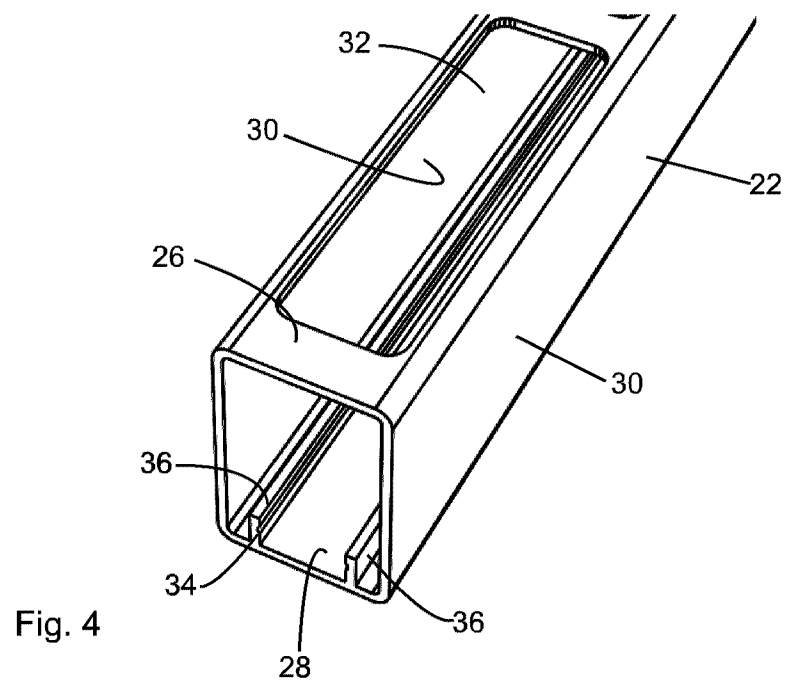
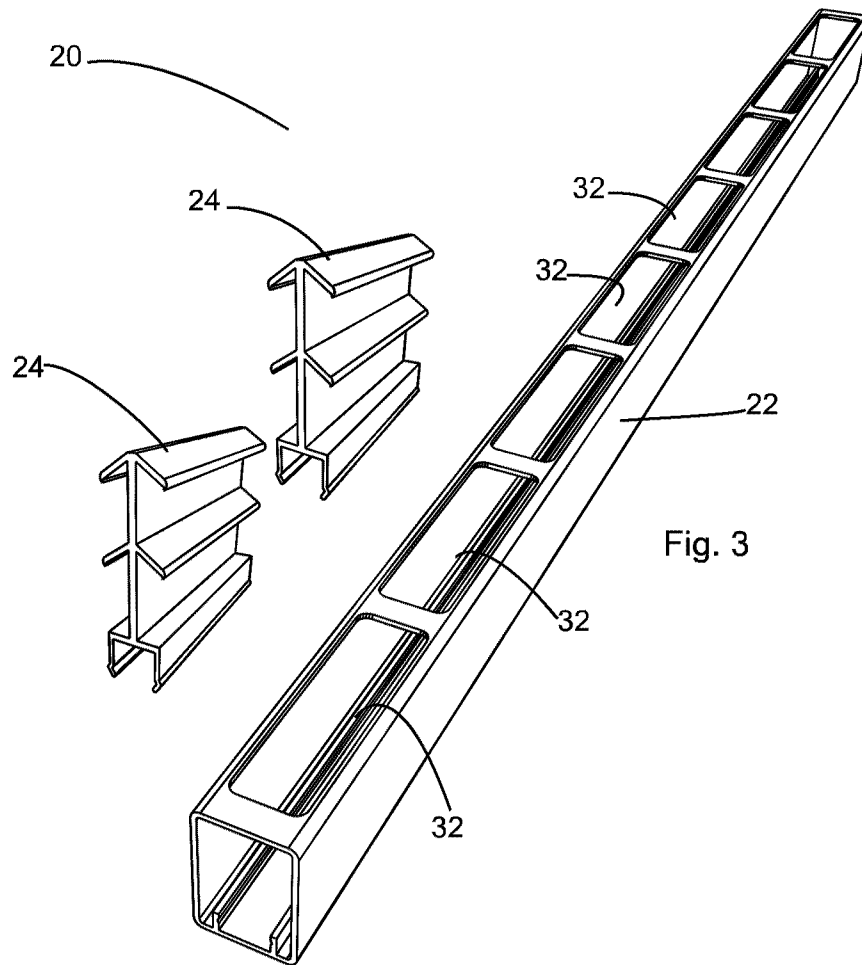


Fig. 2



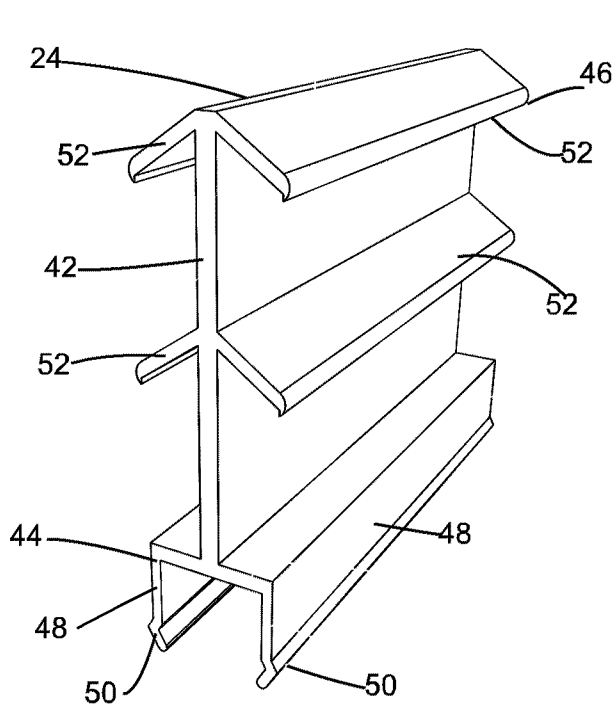


Fig. 5

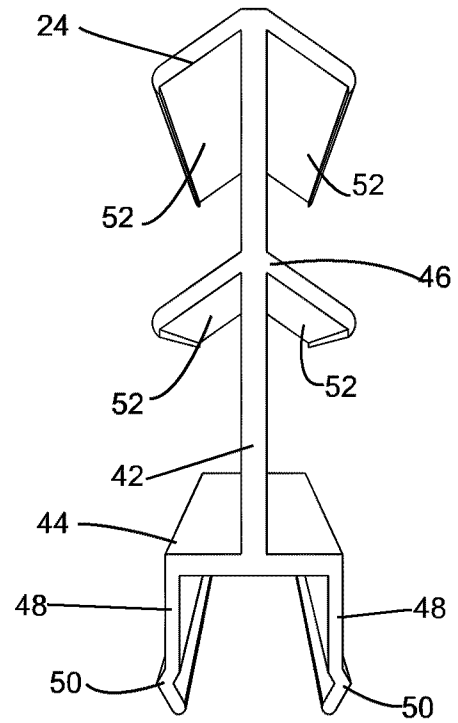


Fig. 6

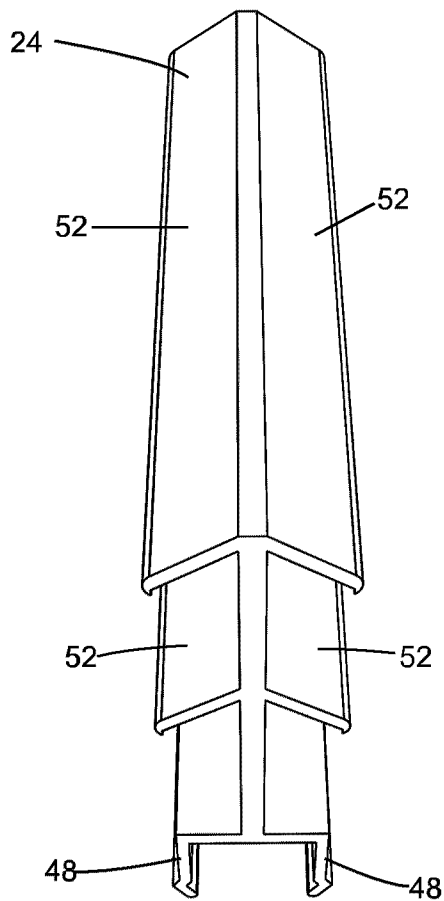


Fig. 7

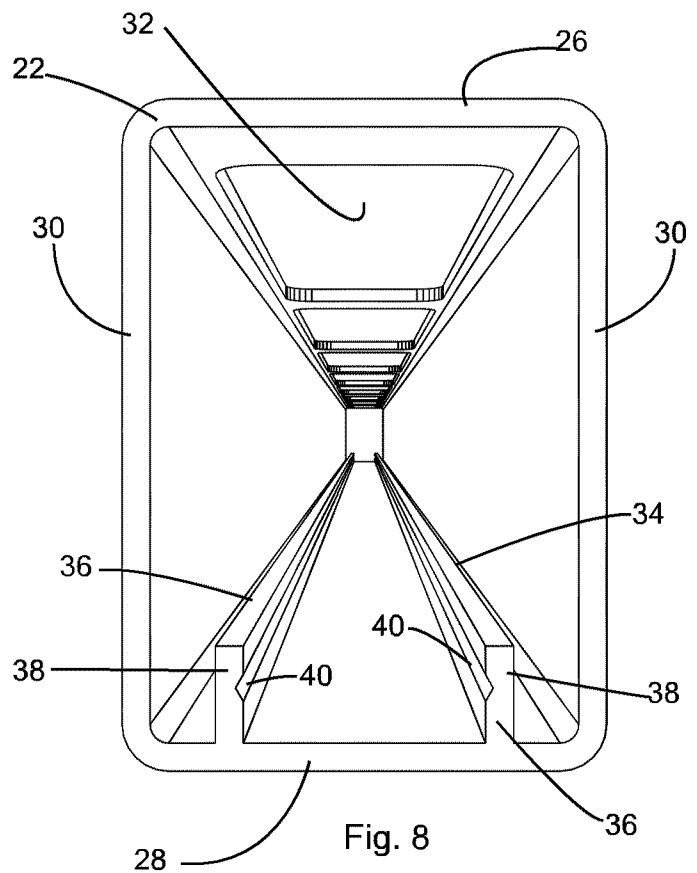


Fig. 8

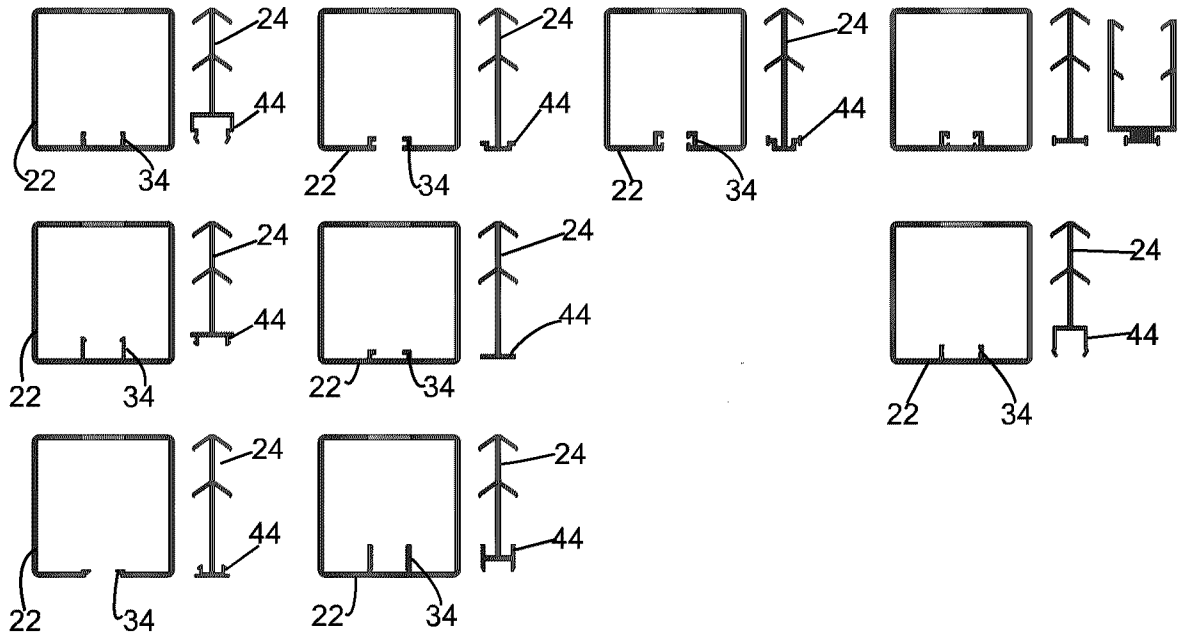


Fig. 9

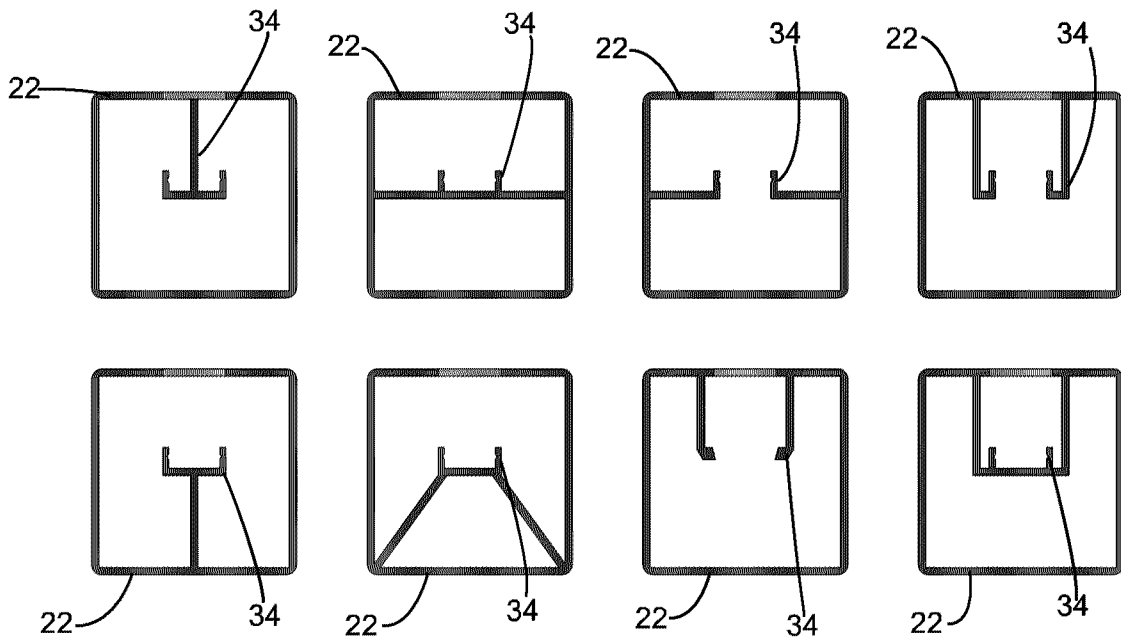


Fig. 10

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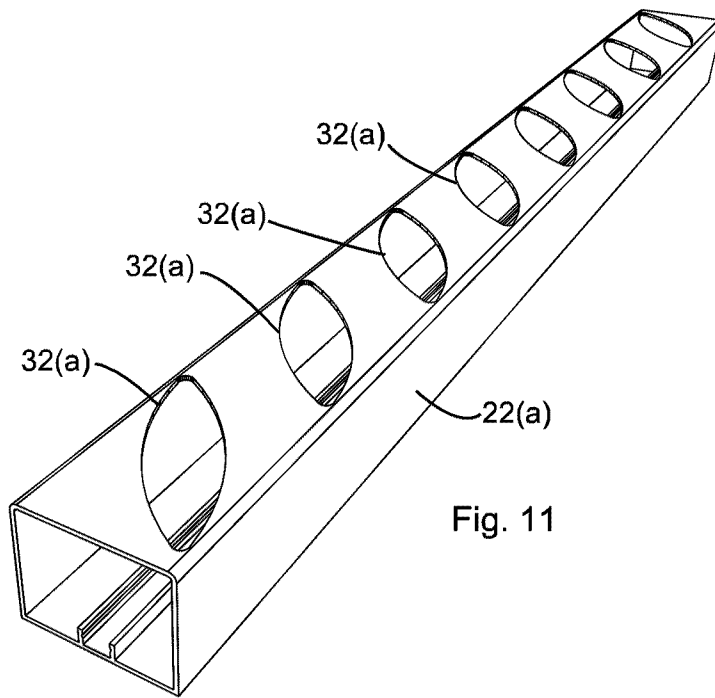


Fig. 11

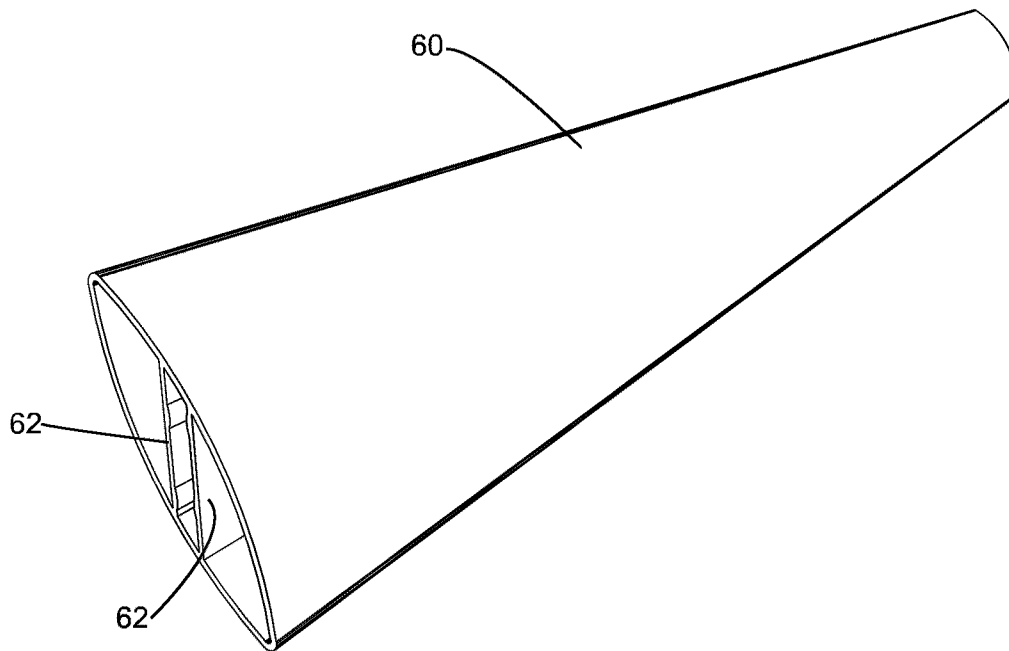


Fig. 12

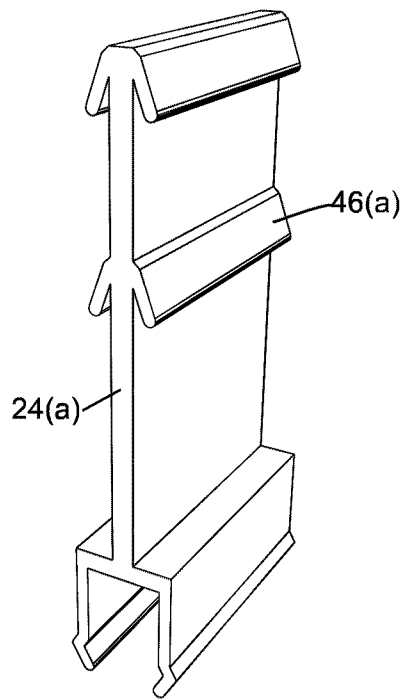


Fig. 13

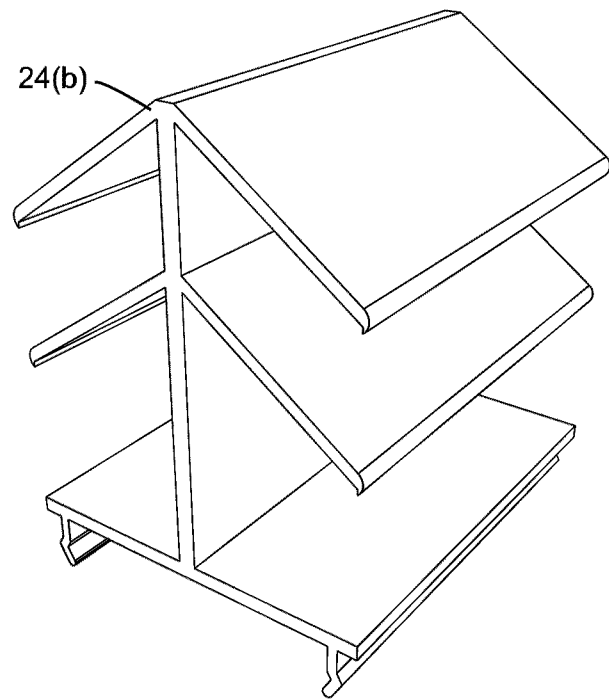


Fig. 14

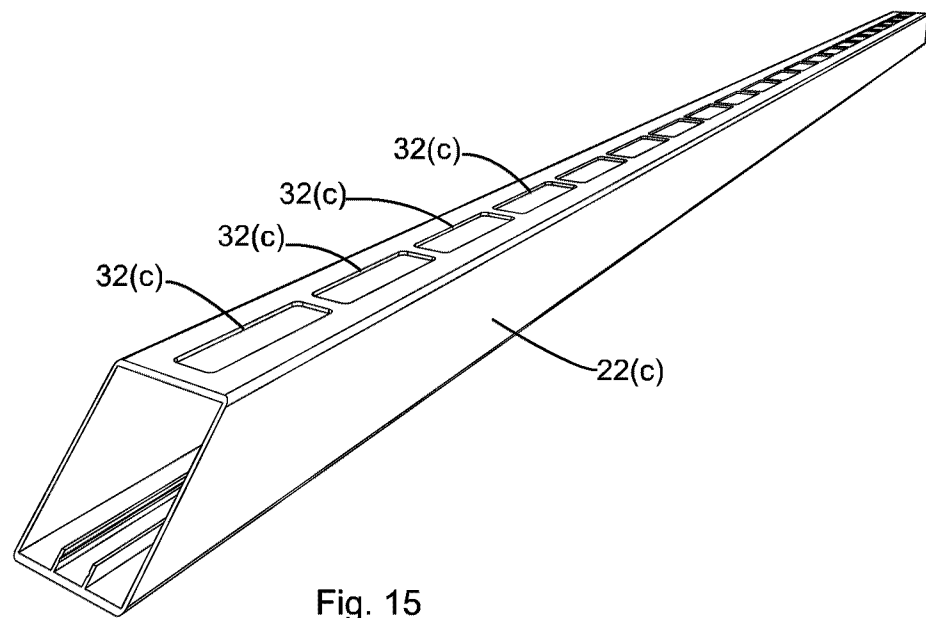


Fig. 15

