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(54) **"A hinge for doors, windows and similar destined for mounting on metal frames"**

Ein Scharnier für Türen, Fenster und dergleichen, das zur Befestigung an Metalrahmen bestimmt ist

Une charnière pour portes, fenêtres et similaires destinée à être montée sur des cadres métalliques

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(56) References cited:
EP-A- 0 659 967 **DE-A- 1 817 951**

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Description

[0001] The present invention relates to a hinge for 'doors, windows and similar destined for mounting on metal frames, and aluminium frames in particular.

[0002] Figures 1 to 4 illustrate a commercially available hinge that represents prior art known by the Applicant closest to the present invention. With reference to these figures, item 10 indicates an aluminium frame having an external contact wall 14 and an undercut groove 12. The groove 12 has a bottom face 16, two parallel side walls 18, and two undercut surfaces 20 that terminate with their respective corners 22.

[0003] Reference number 24 indicates a hinge element with a cylindrical seat 26 that is destined to engage with a pin (not illustrated) carried by a complementary hinge element, also not illustrated. The hinge element 24 has a contact surface 28 that is destined to rest against the contact surface 14 of the frame 10 and a mounting portion 30 equipped with holes 32 through which fixing screws 34 pass. Each hole 32 opens onto a seat 36 destined to receive the head 38 of the respective screw 34.

[0004] The screws 34 engage the respective holes 40 of an anchorage plate 42 that, in use, is inserted in the undercut groove 12. The anchorage plate 42 has a flat mating surface 44 that, in use, is pressed against the corresponding undercut surface 20. The mating surface 44 has an external border 46 and an internal border 48 that, in use, is pressed against the corner 22 of the frame 10. A number of triangular shaped anchorage teeth 50 protrude from the mating surface 44. The part of each tooth 50 that protrudes the most is arranged in correspondence with the internal border 48 of the mating surface 44. Figures 2 and 3 illustrate the operation of mounting the hinge element 24 to the frame 10. It may be noted that, during tightening of the screws 34, the internal border 48 of the anchorage plate 42 is pushed against the corner 22 of the frame 10, and as tightening of the screws proceeds, the teeth 50 gradually bite into the edge 22 until they reach the final mounting position illustrated in Figure 3.

[0005] The teeth 50 produce incisions on the border 22 that tend to impede movement of the hinge along the axis of the groove 12. Nevertheless, experience demonstrates that when the hinge is subjected to blows and/or high intensity loads in the direction of its axis (parallel to the axis of the groove 12), the incisions produced by the teeth 50 do not offer sufficient resistance and the hinge tends to slide with respect to the frame 10. This necessitates adjusting the position of the hinge again.

[0006] The object of this invention is to provide an enhanced type of hinge that allows the drawbacks of the hinge in accordance with the prior art to be overcome.

[0007] According to the present invention, this object is achieved by a hinge having the characteristics forming the subject of claim 1.

[0008] The characteristics and advantages of this in-

vention will become clear from the detailed description that follows, supplied merely as a non limitative example, where:

- 5 - Figures 1 to 4, as previously described, are cross-sections illustrating the mounting sequence of a hinge in accordance with the prior art,
- Figure 4 is a perspective view of the anchorage plate, indicated by arrow IV in Figure 1, of the hinge in accordance with the prior art,
- 10 - Figures 5, 6 and 7 are cross-sections illustrating the mounting sequence of a hinge in accordance with the present invention, and
- Figure 8 is a perspective view of the anchorage plate, indicated by arrow VIII in Figure 5, of the hinge in accordance with the present invention.

[0009] In Figures 5 to 8, the details corresponding to those previously described are indicated using reference numbers incremented by 100. With reference to Figure 8, the anchorage plate 142 includes a series of spaced-out sectors 160, each having a mating surface 144 and a front surface 162. The mating surface 144 has an external border 146 and an internal border 148. The external border 146 essentially forms a 90° angle between the front surface 162 and the mating surface 144. Anchorage teeth 150 are formed on the mating surface 144. In accordance with the present invention, the anchorage teeth 150 have a substantially pyramidal shape with a triangular base and with the part that protrudes most from the mating surface 144 arranged in correspondence with the external border 146. Each tooth 164 has two sides that protrude from the mating surface 144 and converge to an edge that terminates in a vertex 164. This edge is tapered from the vertex 164 towards the internal border 148. The base of each pyramidal tooth is effectively contained in a plane passing along the front surface 162.

[0010] With reference to Figures 5 to 7, the position of the seat 136 with respect to the contact surface 128 of the hinge element 124 is determined such that in the hinge's final mounting configuration, the front surface 162 of the anchorage plate 142 is pressed against the side surface 118 of the channel 112. In this way, the vertex 164 of each of the teeth 150 comes into alignment with the corner 166 formed between the side surface 118 and the undercut surface 120 of the groove 112. As is clearly illustrated in Figures 6 and 7, during tightening of the screws 134, the teeth 150 cut the corner 166 and bite into the material forming the frame 110. The form of the teeth 150 favours their penetration, since the teeth start to bite from the vertex 164, as illustrated in Figure 6.

[0011] Experimental tests carried out by the Applicant have demonstrated that, where other conditions are equal, the hinge in accordance with the present invention offers a significantly more robust mounting with respect to the previously described hinge in accordance with the known technique. In fact, while the border 22 of

the frame section is relatively fragile and can easily be deformed under the action of blows or high-intensity loads acting along the axis of the hinge, the corner 166 represents a significantly more robust zone. The insertion of the teeth 150 in the corner 166 of the frame section 110 provides extremely solid anchoring of the plate 142 and prevents the plate 142 from sliding in the direction of the hinge's axis in a very effective manner. The anchorage effect of the teeth 150 is also particularly effective because, during solicitations, it prevents movement between the wall 162 of the plate 142 and the wall 118 of the frame.

Claims

1. A hinge for doors, windows and similar destined for mounting on a metal frame (110), comprising:

- a hinge element (124), with a contact surface (128) destined to rest against an external surface (114) of the frame (110),
- an anchorage plate (142) with a mating surface (144) destined to rest against an undercut surface (120) of a groove (112) of the frame (110), where the mating surface (144) has an external border (146) and an internal border (148), where the anchorage plate (142) has a front surface (162) facing towards a side surface (118) of the said groove (112) and which forms, together with the said mating surface (144), the said external border (146), and where the anchorage plate (142) includes a number of teeth (150) protruding from the mating surface (144), and
- at least one screw (130) that is used to engage a seat (136) of the hinge element (124) and a hole (140) on the anchorage plate (142) to tighten the mating surface (144) of the anchorage plate (142) against the undercut surface (120) of the groove (112), so as to force the said teeth (150) to bite into the material forming the frame (110),

characterized by the fact that the said teeth (150) have a pyramidal shape with a triangular base and are arranged such that the part that protrudes the most (164) is on the said external border (146) of the mating surface (144), such that when mounted, the vertex (164) of each of the said teeth (150) bites into the corner (166) defined between the undercut surface (120) and the corresponding side surface (118) of the said groove (112).

2. A hinge according to Claim 1, **characterized by** the fact that the said seat (136) of the hinge element (124) is positioned with respect to the contact surface (128) such that, in use, the said front surface

(162) of the anchorage plate (142) is pressed against the side surface (118) of the groove (112).

3. A hinge according to Claim 1, **characterized by** the fact that each of the said teeth (150) has two sides converging to an edge that is tapered from the vertex (164) to the mating surface (144).

Patentansprüche

1. Scharnier für Türen, Fenster und dgl. zur Montage an einem Metallrahmen (110), umfassend:

- ein Scharnierelement (124) mit einer Kontaktfläche (128) zur Anlage an einer Außenfläche (114) des Rahmens (110),
- eine Verankerungsplatte (142) mit einer Passungsfläche (144) zur Anlage an einer hinterschnittenen Fläche (120) einer Nut (112) des Rahmens (110), wobei die Passungsfläche (144) eine Außenkante (146) und eine Innenkante (148) aufweist und die Verankerungsplatte (142) eine Vorderfläche (162) besitzt, die einer Seitenfläche (118) der Nut (112) gegenüberliegt und zusammen mit der Passungsfläche (144) die Außenkante (146) bildet, sowie die Verankerungsplatte (142) eine Anzahl von Zacken (150) aufweist, die von der Passungsfläche (144) vorstehen, und
- wenigstens eine Schraube (130), die in einen Sitz (136) am Scharnierelement (124) und in eine Lochung (140) an der Verankerungsplatte (142) eingreift, um die Passungsfläche (144) der Verankerungsplatte (142) gegen die hinterschnittene Fläche (120) der Nut (112) zu drücken, wobei sich die Zacken (150) in das Material des Rahmens (110) einschneiden,

dadurch gekennzeichnet, dass

die Zacken (150) eine Pyramidenform mit einer Dreiecksgrundfläche aufweisen und derart angeordnet sind, dass der am weitesten abstehende Bereich (164) an der Außenkante (146) der Passungsfläche (144) ist und sich die Spitzen (164) der Zacken (150) bei Montage in die Ecke (166) zwischen der hinterschnittenen Fläche (120) und der entsprechenden Seitenfläche (118) der Nut (112) einschneiden.

2. Scharnier gemäß Anspruch 1, **dadurch gekennzeichnet, dass** der Sitz (136) des Scharnierelements (124) so zur Kontaktfläche (128) angeordnet ist, dass die Vorderfläche (162) der Verankerungsplatte (142) gegen die Seitenfläche (118) der Nut (112) gepresst ist.

3. Scharnier gemäß Anspruch 1, **dadurch gekennzeichnet,**

zeichnet, dass die Zacken (150) zwei Seitenflächen aufweisen, die in einer von der Spitze (164) zur Passungsfläche (144) geneigten Kante zusammenlaufen.

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3. Charnière selon la revendication 1, **caractérisée par le fait que** chacune desdites dents (150) a deux côtés qui convergent vers une arête, laquelle est effilée depuis le sommet (164) vers la surface appariée (144).

Revendications

1. Charnière pour portes, fenêtres et similaires, destinée à être montée sur un cadre en métal (110), comprenant :

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- un élément de charnière (124) avec une surface de contact (128) destinée à reposer contre une surface externe (114) du cadre (110),
- une plaque d'ancrage (142) avec une surface appariée (144) destinée à reposer contre une surface en contre-dépouille (120) d'une gorge (112) du cadre (110), ladite surface appariée (144) ayant une bordure externe (146) et une bordure interne (148), la plaque d'ancrage (142) ayant une surface frontale (162) tournée vers une surface latérale (118) de ladite gorge (112) et formant, conjointement avec ladite surface appariée (144), ladite bordure externe (146), et ladite plaque d'ancrage (142) incluant un certain nombre de dents (150) qui se projettent depuis la surface appariée (144), et
- au moins une vis (130) qui est utilisée pour engager un siège (136) de l'élément de charnière (124) et un trou (140) sur la plaque d'ancrage (142) pour serrer la surface appariée (144) de la plaque d'ancrage (142) contre la surface en contre-dépouille (120) de la gorge (112), de manière à forcer lesdites dents (150) à mordre dans le matériau formant le cadre (110),

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caractérisée par le fait que lesdites dents (150) ont une forme pyramidale avec une base triangulaire et sont agencées de quelle façon que la partie qui se projette le plus loin (164) se trouve sur ladite bordure externe (146) de la surface appariée (144), de sorte que lorsque la charnière est montée, le sommet (164) de chacune desdites dents (150) mord dans le coin (166) défini entre la surface en contre-dépouille (120) et la surface latérale correspondante (118) de ladite gorge (112).

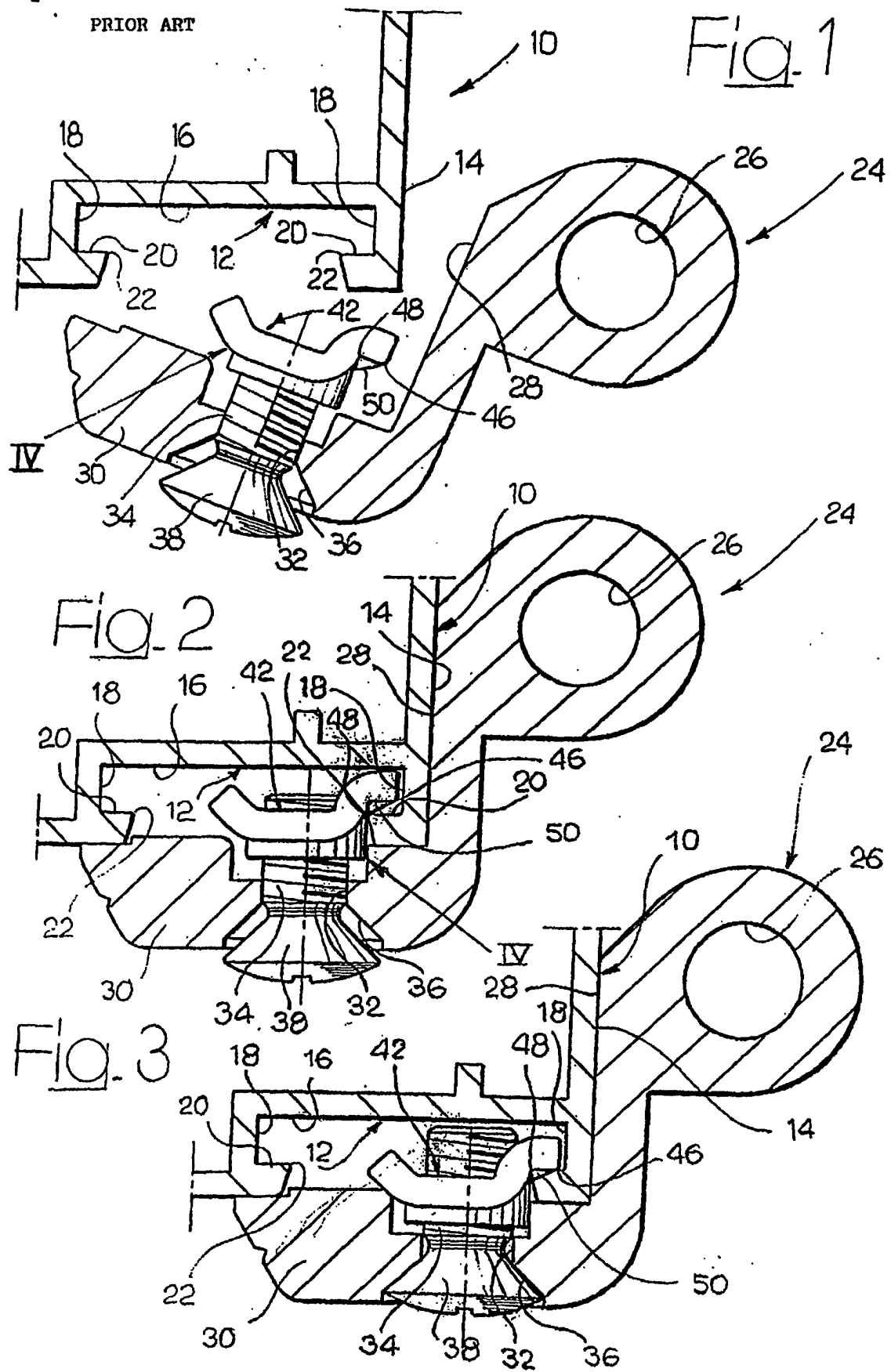
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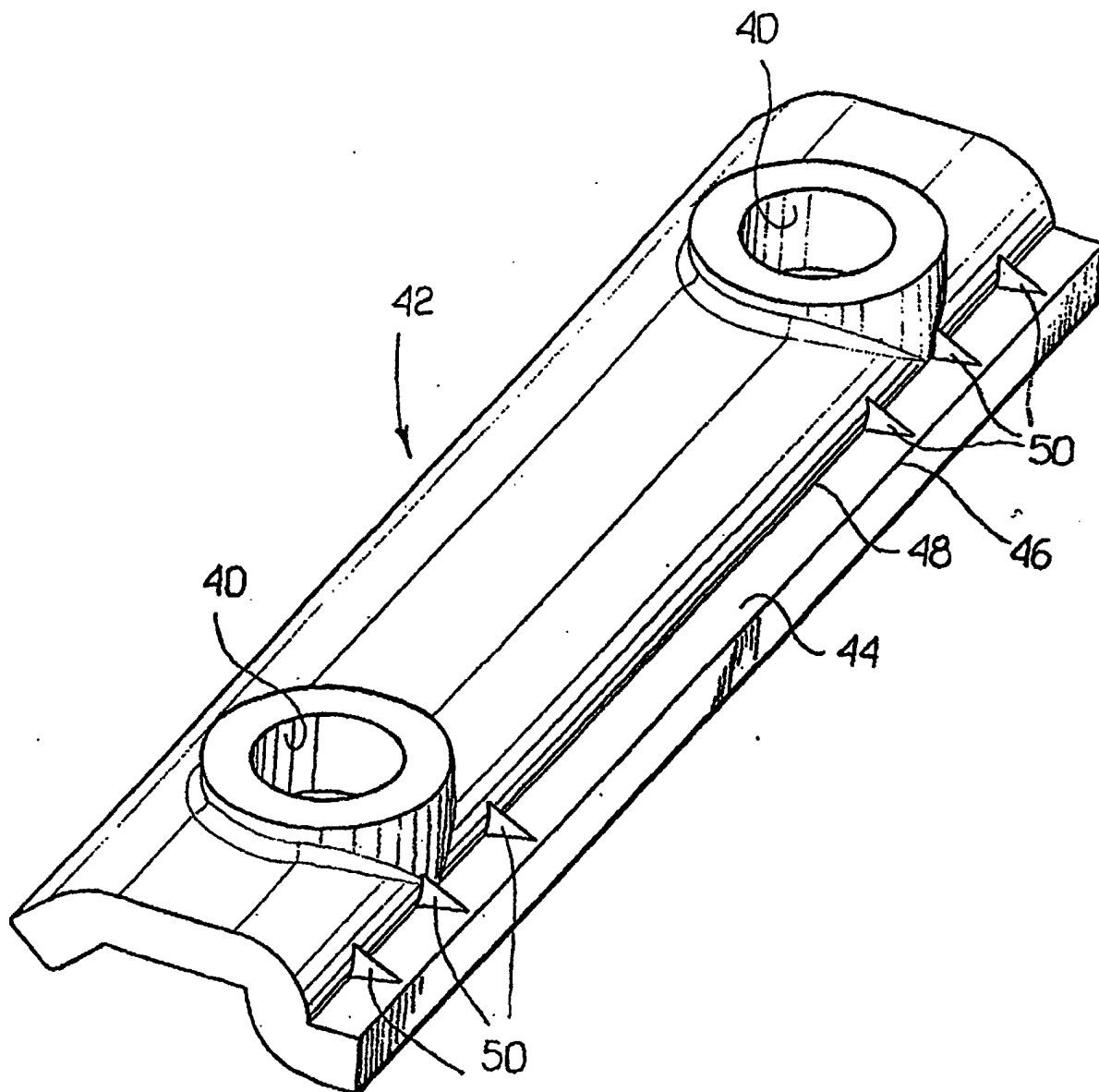
2. Charnière selon la revendication 1, **caractérisée par le fait que** ledit siège (136) de l'élément de charnière (124) est ainsi positionné par rapport à la surface de contact (124) qu'en utilisation ladite surface frontale (162) de la plaque d'ancrage (142) est pressée contre la surface latérale (118) de la gorge (112).

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PRIOR ART

Fig. 4



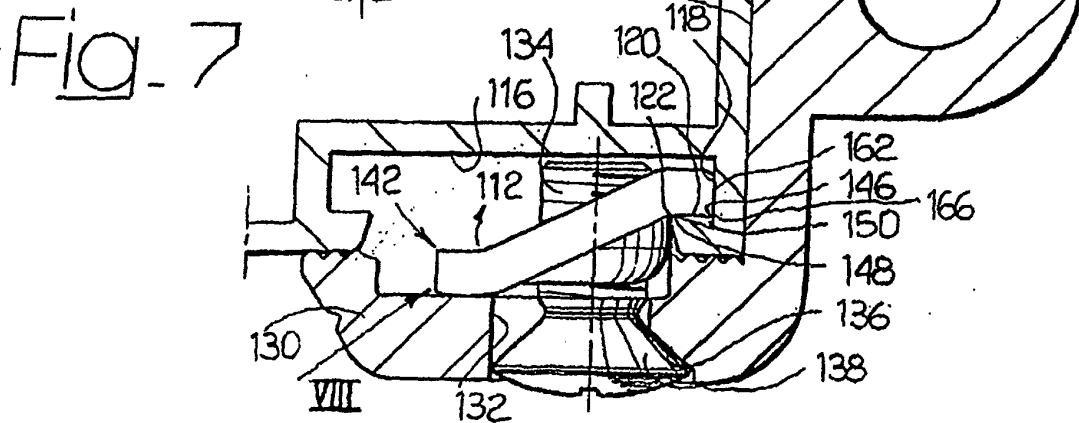
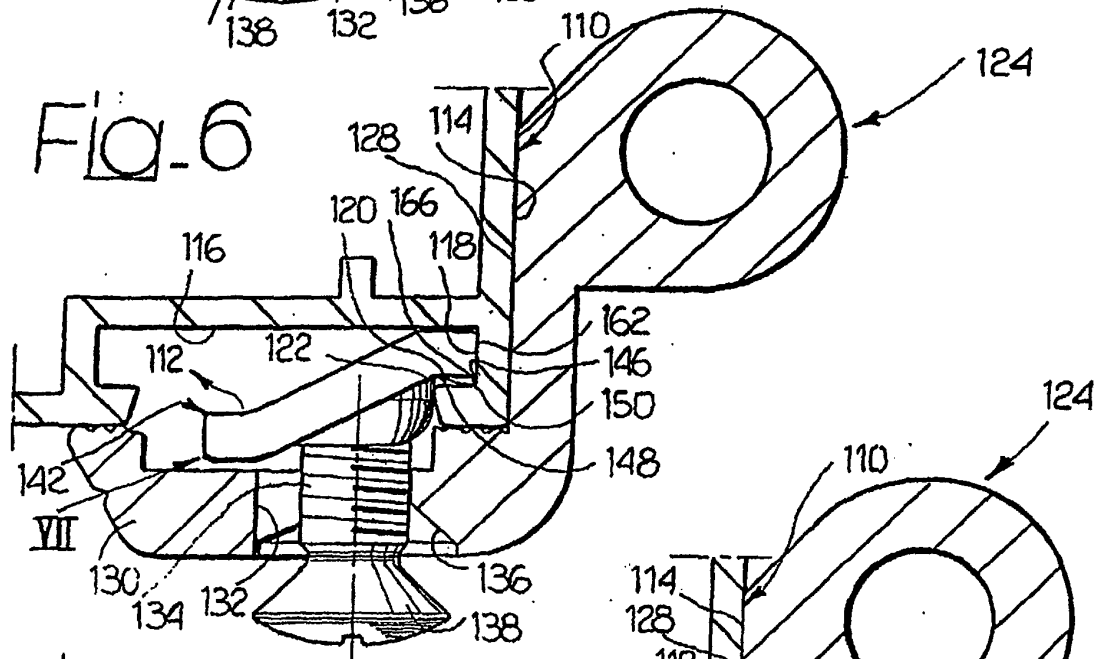
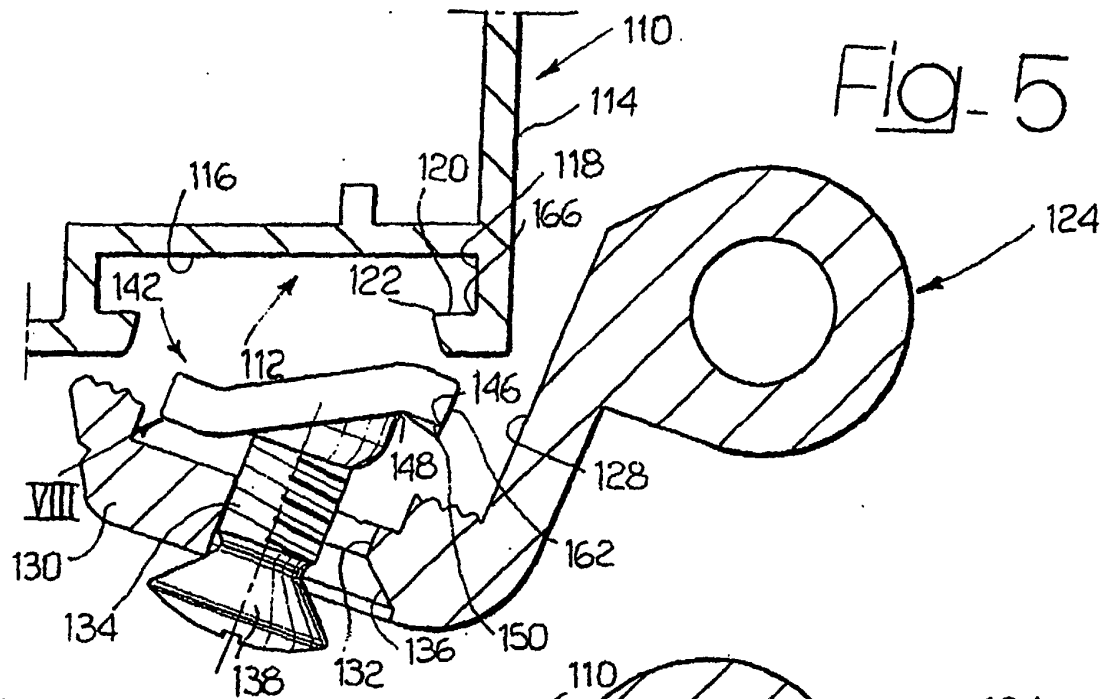


Fig. 8

