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(54) A guard system

(57) A guard system is described for resisting the forced opening of a window or door (1). Security strips (4, 12) are attached to the door or window (1) and its frame (2) to resist the use of a crowbar to force open the door or window (1). To enable the strips (4, 12) to be attached to PVC doors or windows the security strip (12) attached to the door or window (1) may be attached on both sides of a corner thereof. Also, a part (8) of the strip (4) attached to the frame (2) may engage the frame in such a way as to resist the insertion of a crowbar.

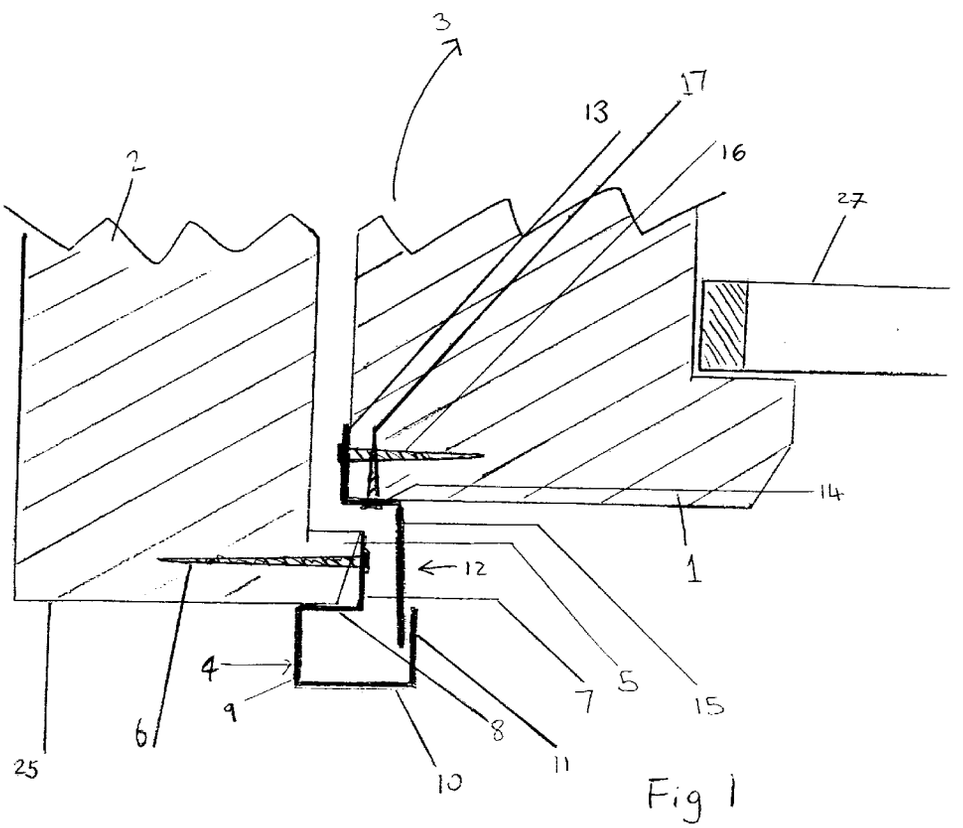

Fig 1

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Description

The present invention relates to a guard system for resisting forced opening of a movable element mounted in a frame.

The movable element, for example a door or a window, will typically be hinged or slidably mounted in a frame. In the case of a door the frame usually extends around three sides, in the case of a window generally the frame surrounds the element. Generally such elements are lockable in their closed positions.

It is known that such movable elements can be forced open by inserting a crowbar between the element and the frame and levering the two apart.

To prevent this from happening, guard systems are known in which security strips are attached to the frame, the movable element or both. In the case of a door, for example, the strips extend along the full height of the door so as to obstruct the opening and thus prevent insertion of a crowbar. A problem with such a system is that the strips must somehow be attached and the means for attachment may itself be vulnerable to attack.

A first attempt to deal with this problem involved the use of special screws which can only be screwed in one direction. However, these screws are in fact removable and the net effect is only that forced opening is delayed, not prevented.

A second attempt to deal with the problem involved the making of the strips in a fully interlocking manner so that, in the closed position, an extension of the first strip covered the screws of the second strip and vice-versa. Such a system is exemplified in EP 0 667 438A. In the open position the screws are freely accessible. Thus ordinary screws can be used and yet removal of the strips is prevented.

A problem that arises with the above system is that it is assumed that the frame extends some distance outwardly from the movable element. In particular it requires enough room beyond the width of the element to screw on a strip, extend the strip away from the element and then fold it back on itself to interlock effectively with the other strip without covering its own screw. To interlock effectively here means to interlock sufficiently to prevent access of a crowbar or like device and there must also be enough room to accommodate expansion/contraction of the door and/or the frame. Generally speaking only wooden frames are so shaped as to provide the necessary freedom. PVC frames are too narrow and the lip of the frame (5 in Figure 1) is generally obliquely angled.

Furthermore it is desirable to ensure that the security strips are resistant to insertion of a crowbar, blade or the like behind them to lever them out directly as a means of getting to the movable element.

According to a first aspect of the present invention there is thus provided a guard system for resisting forced opening of a movable element from its outer side, the movable element being mounted in a frame and movable between open and closed positions, the guard system comprising first and second strips each having an attachment part and a shield part, wherein the attachment part of the first strip has a first leg extending transversely to the plane of the frame and secured by securing means to the frame, the attachment part of the second strip is secured by securing means to the moveable element, and the shield parts of the first and second strips overlap to prevent access to the securing means attaching the second and first strips when the movable element is in the closed position, but permit access to the securing means when the movable element is in the open position, characterised in that: the attachment part of the first strip has a second leg bent back from the first leg against the outer surface of the frame.

The shield part of the first strip may extend outwardly of the frame from the second leg of the attachment strip. By outwardly is meant a direction out of the plane of the frame towards the side of the movable element and frame from which attack is to be resisted.

The outward extension of the second part of the first strip may extend by a predetermined distance beyond the outward extension of the second part of the second strip, so as to allow expansion and contraction of the movable element.

The movable element and/or the frame may be made of plastics and the securing elements may include screws, nails or rivets.

The movable element may be a door or a window.

According to a second aspect of the present invention there is provided a guard system for resisting forced opening of a movable element, the movable element being mounted in a frame and movable between open and closed positions, the guard system comprising first and second strips each having an attachment part and a shield part, wherein the attachment part of the first strip is secured by securing means to the frame, the attachment part of the second strip is secured by securing means to the moveable element, and the shield parts of the first and second strips cooperate to prevent access to the securing means when the movable element is in the closed position, but permit access to the securing means when the movable element is in the open position, characterised in that: the attachment part of the second strip extends around a corner of the movable element and is secured to the movable element by securing means on both sides of the corner of the movable element.

Any attempt to lever out the second strip is defeated by the mutual interaction of the strips and the two securing means on either side of the corner. The strips may be said to interlock. Any attempt to lever out the first strip only pushes the end of its second part against that of the second strip, pushing that towards the frame and making penetration even harder. Similarly, attempts to lever the two strips apart cause the end of the second strip to be pushed towards the frame.

The above two aspects of the invention may be

combined into a single embodiment. The invention also extends to the individual first and second strips for use in the system.

The invention may be applied to door frames made of plastic and in particular of PVC.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made by way of example to the attached drawings in which:-

Figure 1 shows a vertical cross-section of an embodiment of the invention,

Figures 2 to 5 show similar cross-sections of other embodiments of the invention, and

Figure 6 is the same drawing as Figure 1 but marked to show points of possible penetration.

Figure 1 shows a vertical cross-section of an embodiment of the invention. A door 1, or it could equally well be a window, fits within a PVC frame 2. The door 1 is hinged at the far end (not shown) and is openable in the direction of the arrow 3. It is optionally fitted with glazing 27.

A first strip 4 is bent into five sections or legs and is attached to the lip 5 of the frame 2 by securing means being constituted by a line along the length of the strip of screws 6 through the first leg 7. It will be noticed that the end surface of the lip 5, to which the first strip 4 is attached, is at an oblique angle and this is a typical feature of a PVC door frame. The surface of the first leg however, remains perpendicular to the frame and the strip 4 is stably attached because the second leg 8 bends back to meet an outer surface 25 of the frame, this being on the side from which an attempt to force entry may be made. It is against the reaction of this outer surface 25 that the screws 6 must be tightened. These first two legs 7 and 8 form the first part, or attachment part, of the first strip.

The lip 5 is generally not much wider than the width necessary to accommodate the screws 6.

The first strip 4 has a third leg 9 which extends outwardly away from the frame, that is to say in a direction perpendicular to the plane of the frame towards the side from which forced entry is to be resisted, a fourth leg 10 which doubles back parallel to the outer surface 25 of the frame 2 and a fifth leg 11 which folds back towards the door 1 but stops before it reaches as far as the screw 6. In practice it should be sufficiently clear of the screws 6 to allow easy screwdriver access. The third 9, fourth 10 and fifth 11 legs form the second, or shield, part of the first strip.

A second strip 12 is attached to the door 1. The strip consists of three legs 13, 14 and 15. The first leg 13 is attached to the end of the door facing away from the hinges and towards the frame. It is attached by means of a securing means in the form of a line of screws 16. The screws are inaccessible when the door is closed because they are obstructed by the frame but are fully accessible when the door 1 is open.

The second leg 14 of the second strip 12 is relatively short. It extends from the corner of the door along its outer surface. When the door is closed the second leg 14 is obscured by the first strip 4. This leg is attached to the door 1 by means of securing means in the form of a further line of screws 17. The first two legs 13 and 14 form the first part, or attachment part, of the second strip which extends around the corner of the door. The screws of the first leg 16 and of the second leg 17 are offset from one another.

The third leg 15 of the second strip 4 extends outwards, perpendicularly to the plane of the door, to obscure the screws 6. Then it interlocks with the first strip 4 by extending a significant distance behind the fifth leg 11. However it does not extend over the full length of the fifth leg 11. Room is left to allow for expansion of the door which in the case of PVC can be considerable, certainly relative to the width of the lip 5 of the door frame. The third leg 15 forms the second, or shield, part of the second strip 12.

The embodiment of Figure 2 is the same as that of Figure 1 except that the third and fourth legs of the first strip have been combined into a single diagonal leg 18 joining the ends of the second and fifth legs directly, the relative positions of the second and fifth legs remaining unchanged.

The embodiment of Figure 3 is identical to that of Figure 1 except that the second leg 14 of the second strip is slightly extended towards the hinge end of the door and the third leg 19 has a subsection 19a which is bent back towards the frame before a further subsection 19b continues outwards to interlock with the first strip 4. Such an arrangement has the advantage of making it more difficult to insert a crowbar between the first 4 and second 12 strips.

The embodiment of Figure 4 is identical to that of Figure 1 except that the third leg 15 of the second strip 12 is relatively shorter.

The embodiment of Figure 5 is identical to that of Figure 3 except that the third leg 15a of the second strip 12 extends diagonally as a single straight-line section to fit behind the first strip. This has the advantage that it is stronger structurally compared with the embodiment of Figure 3 due to the absence of folds.

Figure 6 shows three positions at which an attempt to force the guard might be made, indicated by the arrows 20, 21 and 22. The arrow 20 shows how a lever, perhaps a blade, might be inserted between the first strip 4 and the frame 2. Here it is important that access is not granted to the space between the frame and the first leg 7 of the first strip 4 as this would expose the screw 6. In fact what levering at this point does is pushes the fifth leg 11 of the first strip 4 against the third leg 15 of the second strip. This third leg 15 is forced back against the corner between the first 7 and second 8 legs of the first strip 4 and thus frustrates the attempt to expose the screw 6. It should be noted that in prior art ar-

rangements (see Figs. 1 to 4 of EPO 667438 A) there is nothing to stop a blade being inserted between the frame and the strip to reach the screw of such prior art arrangements. In contrast, a blade cannot reach the screw in the present invention because a blade cannot turn the corner at the outside end of the lip 5.

An attempt to lever apart the first and second strips at the point marked by arrow 21 is defeated by the expedient of ensuring that the end of the second strip 12 is covered by the first strip 4. This ensures that the attack has to be made at a very awkward angle to the door 1 (bearing in mind that the actual sizes of the strips are generally smaller than shown in the drawings). Furthermore, any such attack will push the third leg 15 of the second strip against the screw 6.

An attempt to insert a lever between the door and the second strip (arrow 22) will push the corner of the second leg 14 of the second strip 12 only as far as allowed by the back of the lip 5 (which is not as far as implied by the Figure). The screws 16 remains firmly in place and acts as a fulcrum and the most that can be achieved is a slight loosening of the screws 17. Again, prior art arrangements provide little protection against such an attack.

An advantage of the system is that it can be applied to a door already damaged by a previous attack. Generally damaged doors have to be replaced and this is often the most expensive item in an insurance claim. However the security strips can be fitted over the damaged door to obscure precisely the parts of the door most likely to have been damaged and to secure the door against future attack.

Claims

1. A guard system for resisting forced opening of a movable element (1) from its outer side, the movable element (1) being mounted in a frame (2) and movable between open and closed positions, the guard system comprising

   first (4) and second strips (12) each having an attachment part and a shield part, wherein
   the attachment part of the first strip (4) has a first leg (7) extending transversely to the plane of the frame (2) and secured by securing means (6) to the frame (2),
   the attachment part of the second strip (12) is secured by securing means (16, 17) to the moveable element, and
   the shield parts of the first (4) and second (12) strips overlap to prevent access to the securing means (6, 16, 17) attaching the second and first strips when the movable element is in the closed position, but permit access to the securing means (6, 16, 17) when the movable element (1) is in the open position,

   characterised in that:

   the attachment part of the first strip (4) has a second leg (8) bent back from the first leg (7) against the outer surface (22) of the frame (2).

2. A guard system according to claim 1 in which the shield part of the first strip (4) extends outwardly from the second leg (8) of the attachment part of the first strip (4).

3. A guard system according to claim 1 in which the shield part of the first strip (4) extends outwardly from the second leg of the attachment part and towards the centre of the frame, and then is folded inwards so that it covers the end of the shield part of the second strip (12) when the movable element is in its closed position.

4. A guard system according to any preceding claim in which the frame (2) and/or movable element (1) are made of plastics.

5. A guard system according to any preceding claim, in which the attachment part (13, 14) of the second strip (12) extends around a corner of the movable element (1) and is secured to the movable element (1) by securing means (16, 17) on both sides of the corner of the movable element (1).

6. A guard system for resisting forced opening of a movable element (1), the movable element (1) being mounted in a frame (2) and movable between open and closed positions, the guard system comprising

   first (4) and second (12) strips each having an attachment part and a shield part, wherein
   the attachment part of the first strip (4) is secured by securing means (6) to the frame,
   the attachment part of the second strip (12) is secured by securing means (16, 17) to the moveable element (1), and
   the shield parts of the first (4) and second (12) strips cooperate to prevent access to the securing means (6, 16, 17) when the movable element (1) is in the closed position, but permit access to the securing means (6, 16, 17) when the movable element (1) is in the open position,

   characterised in that:

   the attachment part (13, 14) of the second strip (12) extends around a corner of the movable element (1) and is secured to the movable element (1) by securing means (16, 17) on both sides of the corner of the movable element (1).

7. A guard system according to any preceding claim, in which the movable element (1) is a door.

8. A guard system according to any preceding claim, in which the movable element (1) is a window.

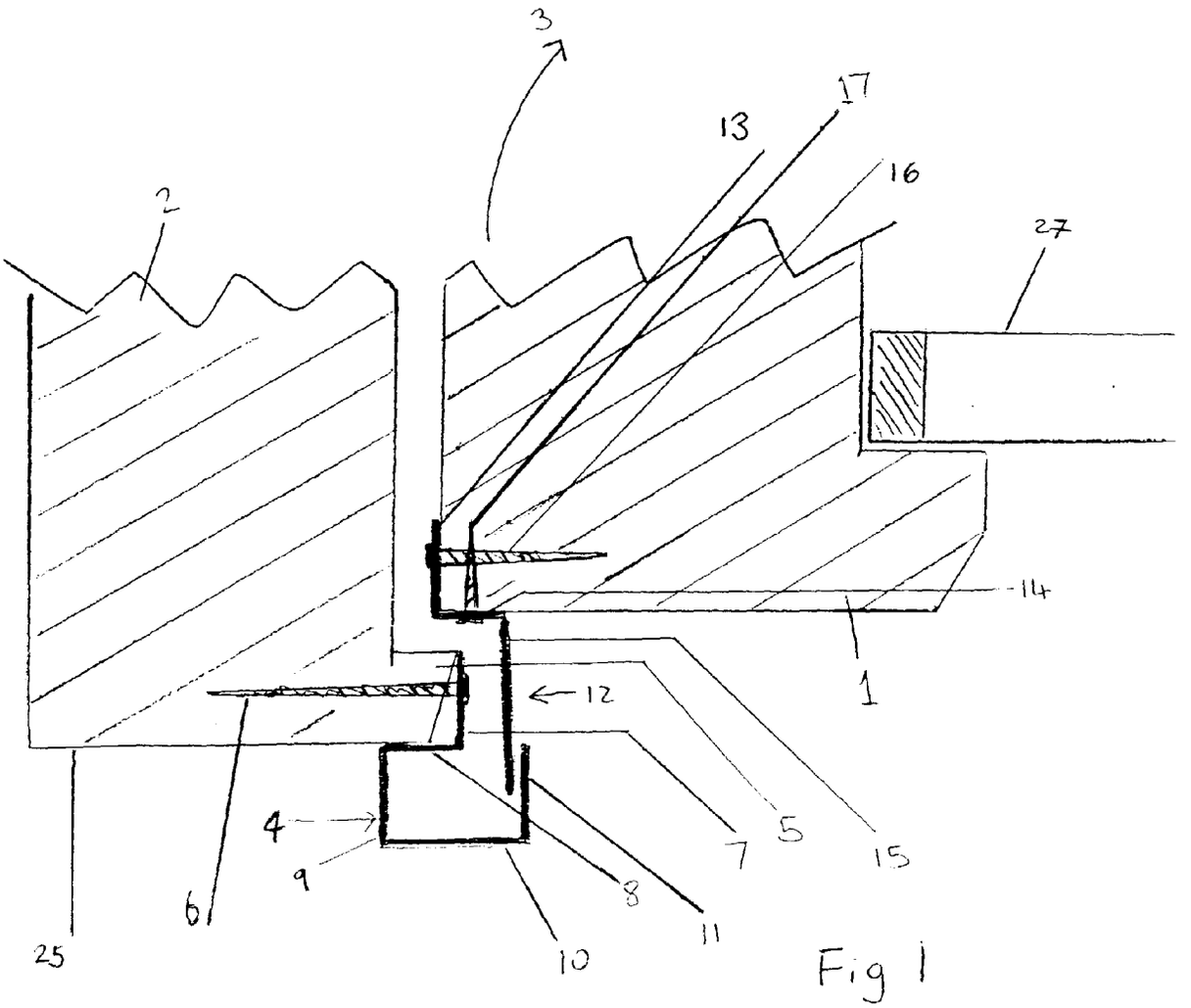

Fig 1

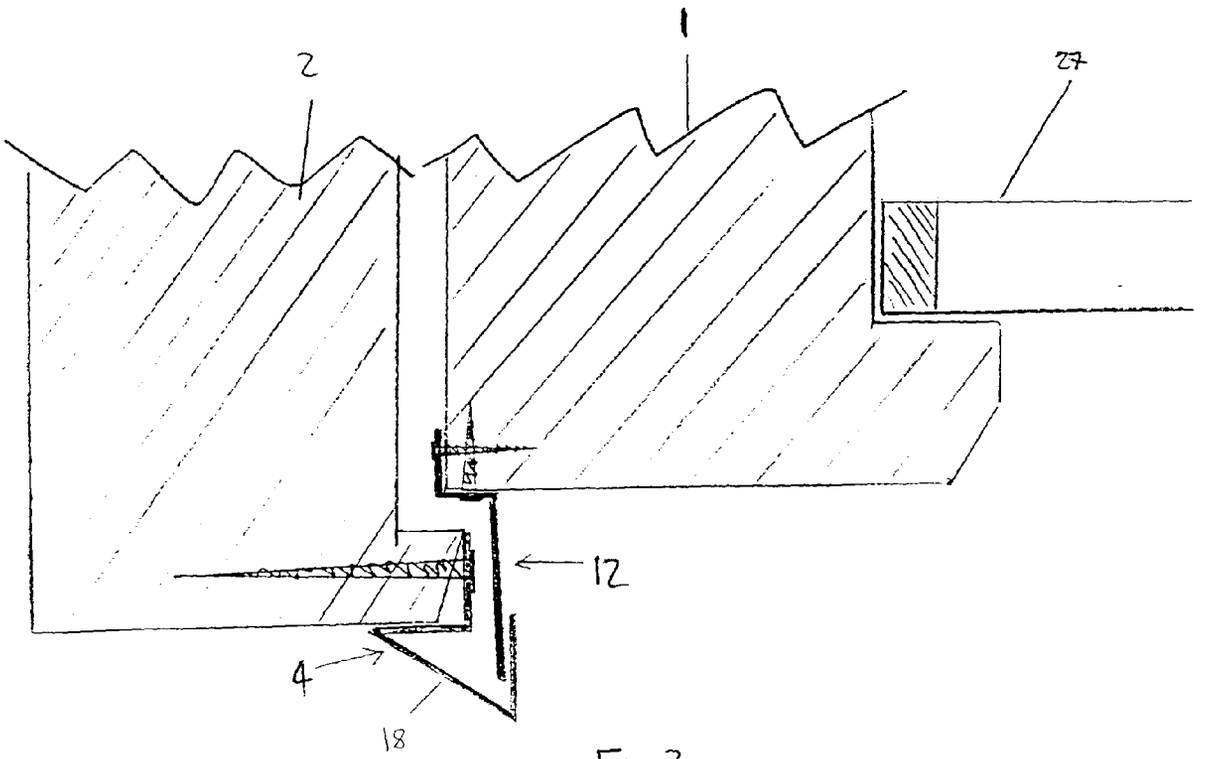

Fig 2

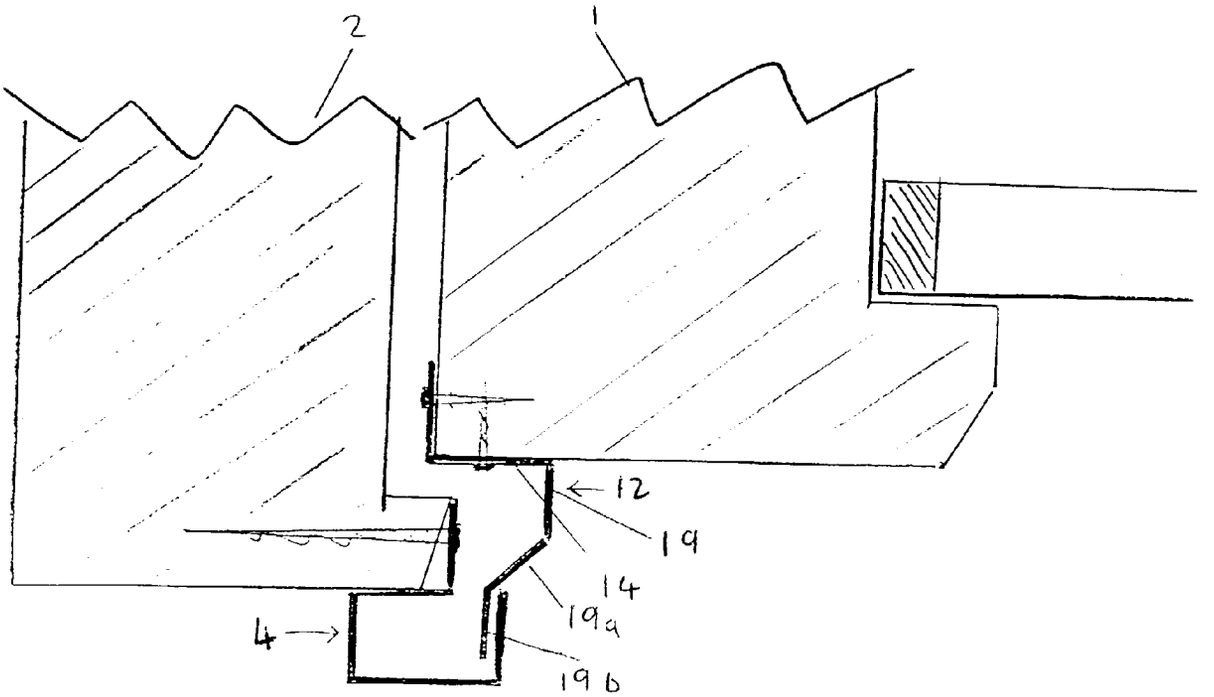

Fig 3

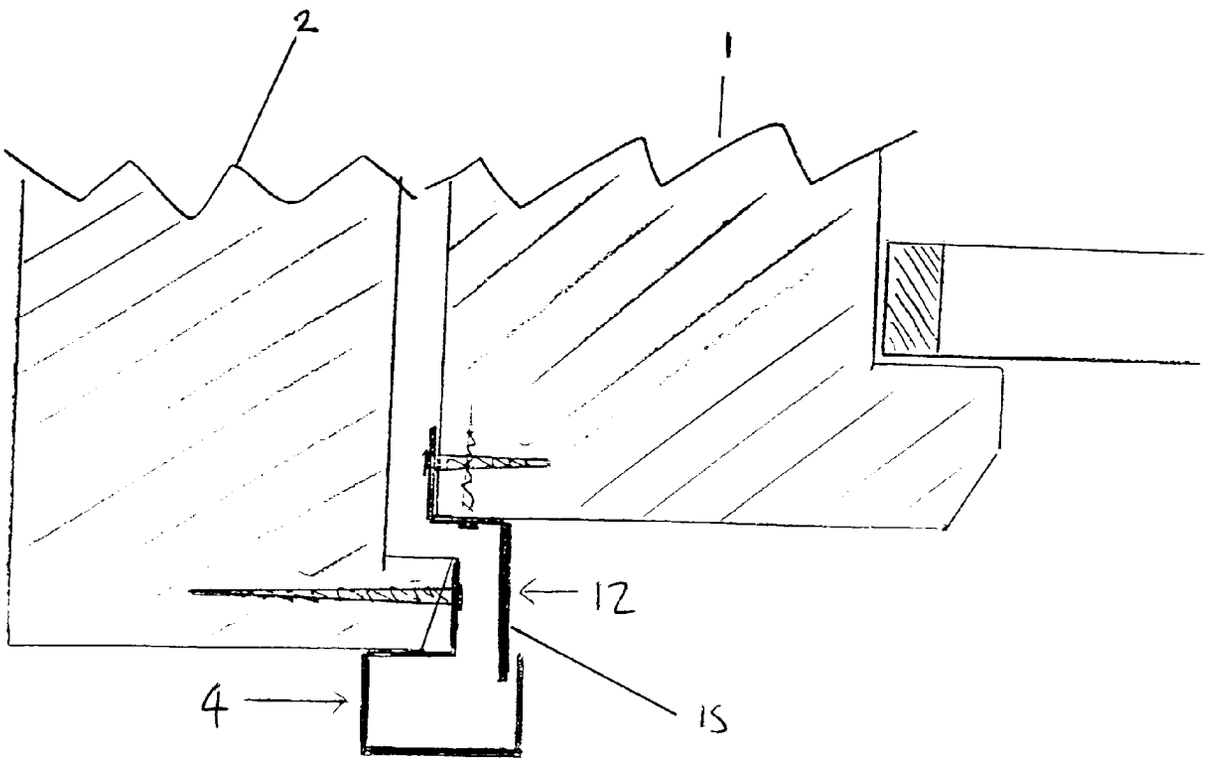

Fig 4

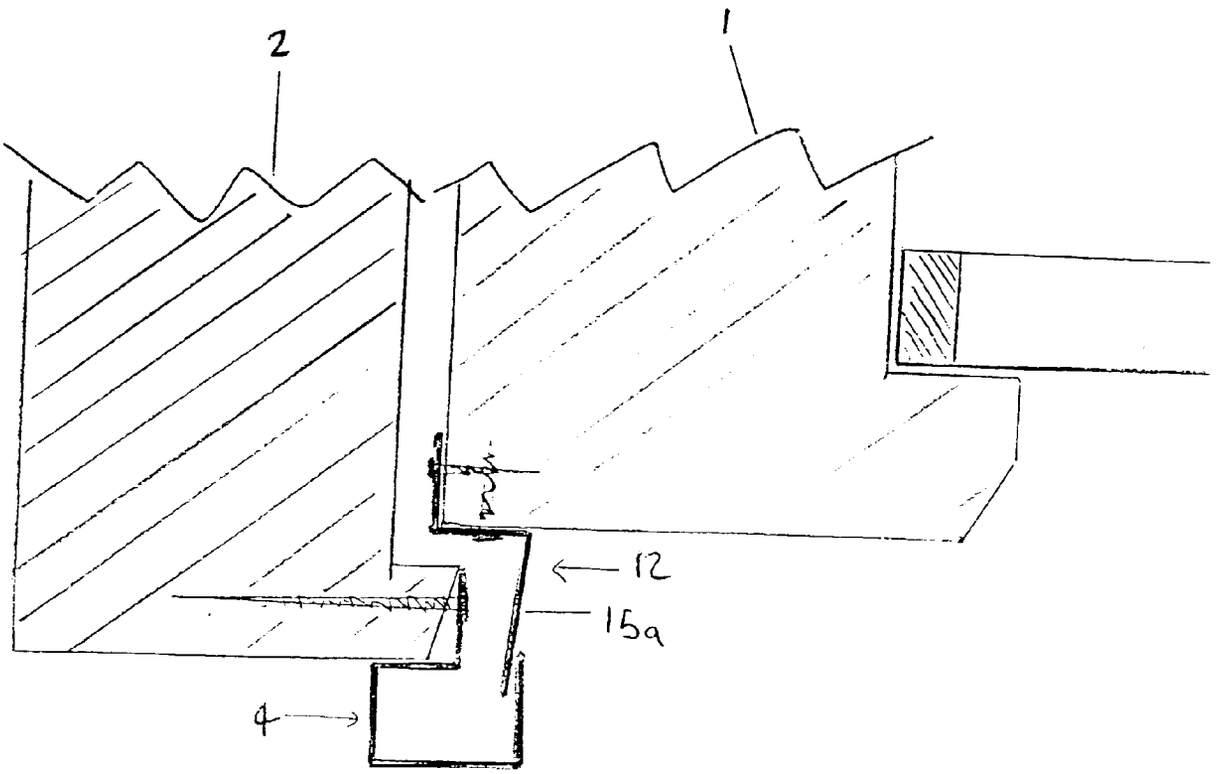

Fig 5

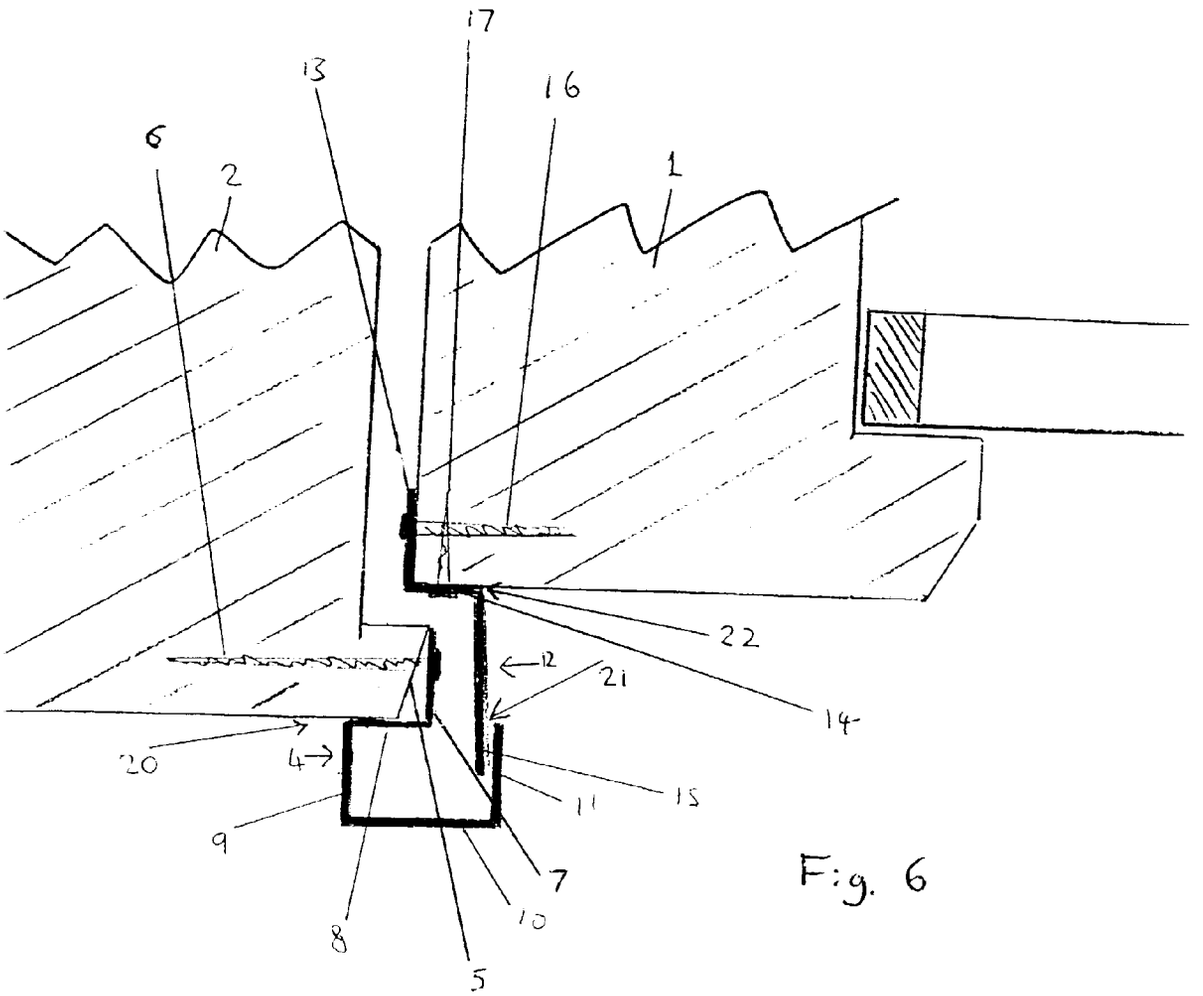

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 97 30 9961

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y	DE 44 41 844 A (VAN GELDER) * column 1, line 56 - column 2, line 27; figure 1 *	1,8 2,3,5	E06B5/11
X Y A	FR 2 408 713 A (BONPUNT) * page 2, line 29 - line 40 * * page 5, line 3 - page 6, line 18 * * page 8, line 1 - line 24 * * figures 2,3,7,8 *	6,7 2,3,5 1	
X A	FR 2 412 676 A (RENAULT) * page 2, line 26 - line 32 * * page 3, line 2 - line 21 *	6,7 5	
A	WO 89 04907 A (SECUSTRIP) * page 4, line 37 - page 5, line 12; figures 2,5 *	1,7	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6) E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	2 March 1998	Depoorter, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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