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(54) Vehicle window frame

(57) A window frame assembly for a vehicle, in which a window frame 20 held in place against a flange 14 of an opening in the vehicle by several spring fasteners 40 so that one side of the window frame abuts a seal 30 engaged on the flange 14. The spring fasteners are located between that seal 30 and an outer seal 31 and abut a further flange 22 on the window frame. The window frame 20 may be pushed into place after the spring fasteners and seal 30 have been located on the flange 14.

FIG. 1.

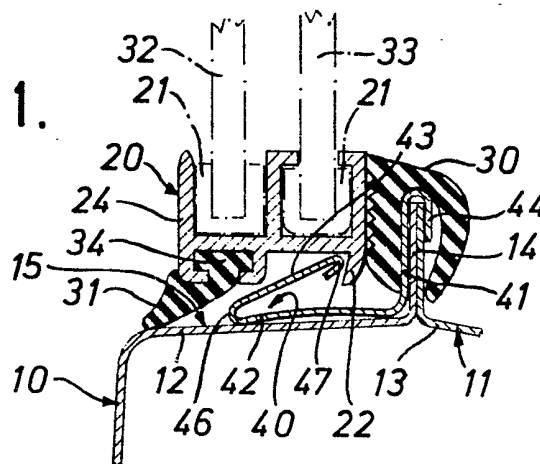


FIG. 1.

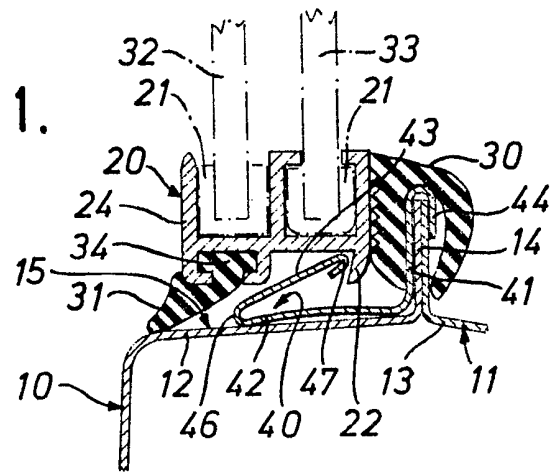


FIG. 2.

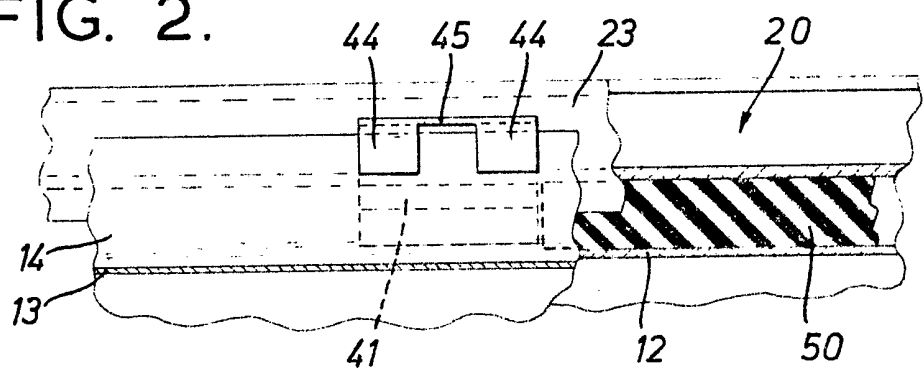


FIG. 4.

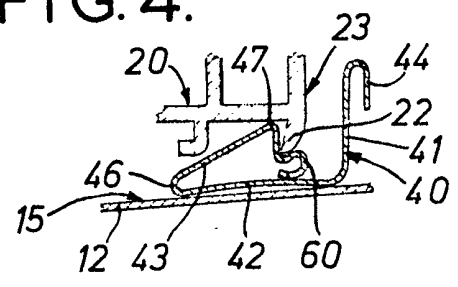


FIG. 3.

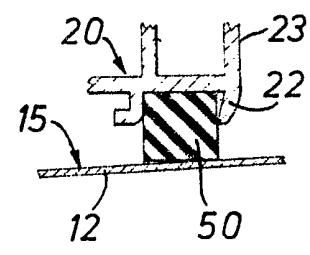
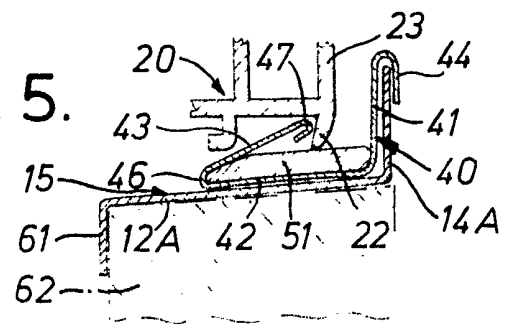


FIG. 5.



SPECIFICATION

Improvements relating to window frame assemblies, for vehicles

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Improvements relating to window frame assemblies, for structures such as vehicles and site huts.

It is well known to provide a window aperture in a structure, such as a vehicle door or body, by forming a portion of the structure so that it constitutes an aperture surround of the kind having a flange which constricts the aperture. It is also well known to secure a window frame to the surround by means of rivets, screws or bolts inserted into the window frame through the flange.

The use of rivets, screws or bolts necessarily involves a considerable amount of work and time to secure a window frame to a surround, of the above described kind.

According to the present invention there is provided a structure having a window aperture defined by an aperture surround, which surround is provided with a flange which constricts the aperture; wherein said structure is provided with a window frame assembly comprising a window frame, a resilient seal member and a plurality of fasteners; wherein said window frame is held by said fasteners in said aperture so that the seal member is clamped between said flange and a side of the window frame; and wherein each fastener comprises a hook engaged on said flange, a first limb which extends alongside said flange from said hook to a second limb which extends away from the flange and abuts the surround, and a third limb which extends at an acute angle from the second limb towards the first limb and engages the window frame to urge the latter towards the flange.

According to the present invention there is also provided a window frame assembly adapted to be secured to an aperture surround of the kind described, wherein the assembly comprises a window frame having a peripheral flange; wherein the assembly is provided with a resilient seal member adapted to be clamped between a side of the window frame and the flange of the surround, and a plurality of spring fasteners formed from metal sheet or strip; wherein each fastener comprises a first limb which extends between a hook and a second limb transverse to the first limb, and a third limb which extends at an acute angle from the second limb towards the first limb, so as to leave a gap between said third and second limbs sufficient to accommodate said peripheral flange and said seal member when the latter is compressed; and wherein said hook is adapted to accommodate and engage said flange of the surround.

The invention also provides a method of assembling the structure of the invention, which method includes the steps of engaging said hooks on said flange of the surround at intervals around the window aperture so that first limbs abut said flange and the second limbs extend close to the surround; locat-

ing the seal member on the flange of the surround so as to extend across said first limbs; and inserting the window frame into the aperture so that the peripheral flange traverses and deflects said third limbs, and pressing said window frame towards the first limbs to compress the seal member and to permit the peripheral flange to enter the gaps so that the third limbs engage a side of the peripheral flange to retain the frame against the seal member.

For large or heavy windows, additional support is preferably provided for the lower run of the window frame. The support may be integral with or inserted into the spring fasteners, or may be separate therefrom.

The invention further provides a spring fastener for use in said structure and said method, which fastener comprises a first limb which extends between a hook and a second limb transverse to the first limb, and a third limb which is joined to the end of the second limb remote from the first limb and extends at an acute angle from the second limb towards the first limb so as to have a gap between the first limb and the third limb; wherein the fastener is formed from sheet or strip metal so that the hook extends alongside that side of the first limb which is remote from the gap; and wherein said third limb is resiliently flexible to allow said acute angle to be reduced by bending the third limb towards the second limb.

The spring fastener, which is preferably of stainless steel or other corrosion resistant or protectively coated metal.

The invention will be described further, by way of example, with reference to the accompanying drawings, wherein:-

Figure 1 shows, in transverse vertical section, parts of a structure of the invention which parts include the lower runs of an aperture surround, a window frame assembly and a spring fastener of the invention *in situ* in the surround;

Figure 2 shows parts of said lower runs, in part sectional side elevation, with a seal member removed, and also shows an additional support;

Figure 3 shows the additional support, in cross section;

Figure 4 shows a modified spring fastener which incorporates additional support, in cross section; and

Figure 5 shows the spring fastener of Figure 1 and a further form of additional support, in a frame form of surround.

Referring to Figures 1 and 2, the surround is formed by a vehicle door outer member 10 and a vehicle door inner member 11 shaped to define a window aperture bounded by outer and inner peripheral webs 12, 13 which are connected by a composite welded up flange 14 which projects into and constricts the window aperture. The web 12 provides a window support surface 15 which diverges in a direction away from the flange 14.

The window assembly comprises a frame 20, a seal member 30, an outer seal 31, glazing panes 32, 33, and several spring fasteners in the form of clips

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The frame 20 is formed from an aluminium or other suitable metal or plastics extrusion, so as to define internal glazing channels which accommodate slides or glazing seals 21 locating the panes 32, 33. The extrusion is shaped so as to provide a peripheral flange 22 which is preferably disposed so that it extends the inside side surface 23 (Figure 2) of the frame, but may be outwardly offset from the plane of the surface 23; and is shaped to define a peripheral T-section locating channel adjacent to the outside side surface 24 of the frame. The locating channel accommodates a T-section head 34 of the outer seal 31 so that the latter resiliently engages the outer web 12 of the surround.

The seal member 30 and seal 31 are rubber or plastics extrusions. The seal member 30 defines an internal channel which accommodates the flange 14, and has an outer abutment face which is ribbed so as to resiliently engage the inside surface 23 of the frame.

Each spring clip 40 primarily comprises a first limb 41 nearly perpendicular to a second limb 42 and a third limb 43.

The first limb has a pair of hooks, 44 joined by an arched bridge 45 (Figure 2), which are arranged to embrace the flange 14 so as to hold the first limb against the flange 14 and the second limb 42 against the surface 15 of the web 12. The outside end of the second limb is joined to the third limb by an acute elbow 46 so that the third limb is inclined towards the first limb. The third limb 43 terminates at a nose 47 which engages an outside face of the flange 22 to hold the frame against the seal member 30.

Fitting the window assembly to the surround can be accomplished quickly by:

- (a) locating the clips 40 at reasonably regularly but not accurately spaced intervals around the surround so that the hooks 44 engage the flange 14,
- (b) fitting the seal member to the flange 14 so that it also embraces the first limbs and the hooks to conceal the hooks, and
- (c) pushing the glazed window frame (with the seal 31 *in situ*) from the outside towards the flange 14 until the noses 47 engage the outside face of the flange 22.

During operation (c) above the flange 22 will ride on and deflect the third limbs 43 until the peripheral edge of the flange 22 passes over the noses 42 allowing the third limbs to spring back towards the frame; and the seal 31 will abut the surface 15 to conceal said second and third limbs.

Furthermore, removal of the frame can be accomplished easily from inside the vehicle by pulling out the seal member, and levering the hooks from the flange 14 with the aid of a screwdriver or like tool inserted between the flange 14 and the arched bridges 45.

To prevent the window assembly moving unduly in the plane of the aperture, especially due to the weight of the window assembly, one or more resilient or firm support blocks 50 may be located between the frame and the surround as shown in Figures 2 and 3. Alternatively, small support blocks 51 may be inserted in some of the spring clips along the

lower run of the frame.

Where blocks 50 or 51 are employed it may be necessary during fitting to position and press into place the lower run of the frame last so as to take advantage of the clearance provided by the uppermost spring clips when the upper run has been thrust into position.

As an alternative to, or in addition to, the use of support blocks, the third limb of the spring clip may have a load supporting extension 60 as shown in Figure 4, which extension is shaped so that it can slide along the second limb towards the first limb as the third limb is deflected during fitting, but is prevented from so doing by the flange 22 when the flange 22 has passed over the nose to rest on the extension 60.

The window aperture may be bounded by separate surround in the form of an outer frame 61, as shown in Figure 5, which frame is securable into a structure 62, and provides a peripheral web 12A and a flange 14A which projects into and constricts the window aperture.

The length of the spring clip, in the direction of the run of the frame, may be greatly extended so as to reduce the number of spring clips required. The spring clips may be of stiff resilient plastics material.

The vehicle may be a van, caravan, lorry, coach, boat, train, or trailer, the surround being provided by or in a door, wall, body or like part of the structure.

95 CLAIMS

1. A structure having a window aperture defined by an aperture surround, which surround is provided with a flange which constricts the aperture; wherein said structure is provided with a window frame assembly comprising a window frame, a resilient seal member and a plurality of fasteners; wherein said window frame is held by said fasteners in said aperture so that the seal member is clamped between said flange and a side of the window frame; and wherein each fastener comprises a hook engaged on said flange, a first limb which extends alongside said flange from said hook to a second limb which extends away from the flange and abuts the surround, and a third limb which extends at an acute angle from the second limb towards the first limb and engages the window frame to urge the latter towards the flange.

2. A structure as claimed in Claim 1, wherein the window frame has a peripheral flange which is engaged by each fastener so that the peripheral flange is held in a gap between the third limb and the first limb of the fastener; and wherein each fastener is formed from metal sheet or strip.

3. A structure as claimed in Claim 1 or 2, wherein an outer seal is located between the window frame and the surround so as to be spaced apart from the seal member and conceal the second and third limbs of the fasteners.

4. A structure as claimed in claim 1, 2 or 3, wherein the seal member is provided with an internal channel in which the hooks are concealed.

5. A structure as claimed in claim 1, 2, 3 or 4, in which additional supports is provided for a lower run of the window frame to provide support for the weight of the window assembly.

6. A structure as claimed in claim 5, wherein said additional support comprises a support block or blocks located between the window frame and the surround or between the window frame and said second limbs.

7. A structure as claimed in claim 5, wherein the additional support is provided by one or more of the fasteners being provided with an extension of the third limb, which extension is shaped to abut the second limb and said window frame.

8. A window frame assembly constructed and arranged for use in the structure claimed in any preceding claim, wherein the assembly comprises a window frame having a peripheral flange; wherein the assembly is provided with a resilient seal member adapted to be clamped between a side of the window frame and the flange of the surround, and a plurality of spring fasteners formed from metal sheet or strip; wherein each fastener comprises a first limb which extends between a hook and a second limb transverse to the first limb, and a third limb which extends at an acute angle from the second limb towards the first limb, so as to leave a gap between said third and second limbs sufficient to accommodate said peripheral flange and said seal member when the latter is compressed; and wherein said hook is adapted to accommodate and engage said flange of the surround.

9. A method of assembling the structure claimed in any one of claims 1 to 7, which method includes the steps of engaging said hooks on said flange of the surround at intervals around the window aperture so that first limbs abut said flange and the second limbs extend close to the surround; locating the seal member on the flange of the surround so as to extend across said first limbs; and inserting the window frame into the aperture so that the peripheral flange traverses and deflects said third limbs, and pressing said window frame towards the first limbs to compress the seal member and to permit the peripheral flange to enter the gaps so that the third limbs engage a side of the peripheral flange to retain the frame against the seal member.

10. A spring fastener constructed and arranged for use in the structure claimed in any one of claims 1 to 7 and in the method of claim 9, comprising a first limb which extends between a hook and a second limb transverse to the first limb, and a third limb in which is joined to the end of the second limb remote from the first limb and extends it at an acute angle from the second limb towards the first limb so as to leave a gap between the first limb and the third limb; wherein the fastener is formed from sheet or strip metal so that the hook extends alongside that side of the first limb which is remote from the gap; and wherein said third limb is resiliently flexible to allow said acute angle to be reduced by bending the third limb towards the second limb.

11. A fastener as claimed in claim 10 having a pair of said hooks joined by a bridge at one end of said first limb.

12. A spring fastener, window assembly or structure substantially as hereinbefore described with reference to Figure 1, or Figures 1, 2 and 3, or Figure 4, or Figure 5 of the accompanying drawings.