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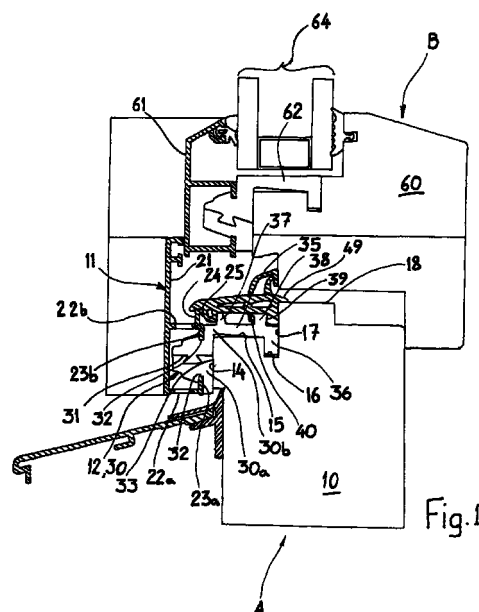
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(54) **Composite wood-aluminium window frame**

(57) A composite wood/aluminium structure for the manufacture of door and window frames is described and comprises a first, wooden structural element (10, 60), a second, aluminium structural element (11, 61), and joining means (12, 62) between the structural elements. The joining means comprise a plurality of clips (30) disposed at intervals along the structural elements and connected to the first structural element (10, 60) by a restrained coupling and to the second structural element (11, 61) by a shaped coupling, both couplings being releasable and being the sole means of connection between the elements and the clips (30, 130, 230) so that the connection between the structural elements (10, 11) is releasable.



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Description

[0001] The present invention relates to a composite wood/aluminium structure for the manufacture of door and window frames, according to the preamble to the main claim.

[0002] It is known to produce wood/aluminium composite structures in which a wooden section is assembled with an aluminium section by joining means. In structures produced by the Applicant, the joining means are constituted, for example, by special accessories (known as "clips") which are generally made of resin and which have an element for attachment to the wooden section on one side and an element for attachment to the aluminium section on the other side, in order to form a mechanical connection between the wooden and aluminium structural elements. For doors and windows which can be opened, a weatherstrip may be fixed to the wooden section or to the aluminium section or to both to ensure adequate abutment sealing when the door or window is closed. In this case, the weatherstrip and/or the clips are fixed to the wooden section by means of screws, which are responsible for the stability of the connection.

[0003] A first disadvantage encountered with the known structures is that fixing by means of screws prolongs the time required to assemble the door or window and is susceptible to errors in the positioning of the clips. Moreover, it necessitates the use of assembly templates and screwdrivers.

[0004] In this connection, the problem upon which the present invention is based is that of providing a composite wood/aluminium structure for the manufacture of door and window frames which prevents all of the problems complained of with reference to the prior art mentioned.

[0005] This problem is solved by the invention by a structure formed in accordance with the appended claims.

[0006] The characteristics and the advantages of the invention will become clearer from the following detailed description of some preferred but not exclusive embodiments thereof, described by way of non-limiting example with reference to the appended drawings, in which:

- Figure 1 is a cross-section through a portion of a door or window frame produced from a composite structure according to the present invention,
- Figure 2 is a cross-section showing a detail of the structure of Figure 1 on an enlarged scale,
- Figure 3 is a perspective view of a corner element used at the corners of a window or door according to the present invention,
- Figure 4 is a section showing the corner element of Figure 3 on an enlarged scale,
- Figures 5 and 6 are cross-sections similar to Figure 1 of a second embodiment and a third embodiment of the door or window frame formed in accordance

with the invention, respectively.

[0007] In the drawings, in which all similar details are indicated by the same reference numerals, two composite wood and aluminium sections belonging to the fixed frame and to the opening frame of a door or window, respectively, are indicated A and B, respectively.

[0008] The section A is formed by a composite structure according to the present invention and comprises a first, wooden structural element 10, a second structural element 11 made of aluminium (or other materials, including synthetic resins), as well as clip joining means 12 disposed between the above-mentioned structural elements for joining them together in the manner described below.

[0009] The first structural element 10 comprises, along one of its edges, two adjacent walls substantially (but not necessarily) at right angles, of which the first is indicated 14 and the second is indicated 15. A groove 16 is formed along the wall 15 on the opposite side to the edge, close to a third wall 17 which is adjacent a fourth wall 18. In practice, the groove 16 and the third wall 17 thus extend parallel to the first wall 14.

[0010] The second structural element 11 comprises a flange 21 from which two webs 22a, 22b, both having free ends formed with respective facing lips 23a, 23b, extend. A rim 24 with an end lip 25 extends from the flange 22b.

[0011] The joining means 12 comprise a plurality of clips 30 fitted, for example, with a ratio of one clip 50 mm long for approximately every 250 mm of section.

[0012] With particular reference to Figures 1 and 2, each clip 30 is formed by the assembly of two elements 30a, 30b which are fitted together, for example, by a dovetail joint; once the elements have been joined together they form an enlarged head 31 with two channels 32 in its base. The head 31 is housed between the webs 22a, 22b with the lips 23a, 23b housed in the respective channels 32. A substantially flat wall 33 identified on the opposite side to the head 31 is in abutment with the wall 14 when the clip is fitted. The clip 30 further comprises a flange 35 extending approximately at right angles from the wall 33 and terminating in a bead 36 which can be fitted in the groove 16. The flange 35 bears two substantially parallel appendages 37, 38 of which one (38) has a tooth 39.

[0013] With reference to the embodiments of Figures 5 and 6, on the other hand, the respective clips 130 and 230 used in the assembly of the frame A have heads 131 each formed in a single piece with two resiliently deformable complementary-lips 131a, 131b, functionally equivalent to the channels 32 of the previous embodiment, for snap-engaging the lips 23a, 23b.

[0014] Each clip 130 also has a single appendage 138 with a tooth 139, whereas the clips 230 do not have such appendages.

[0015] A weatherstrip 40 is fitted on the section A for sealing against the section B by means of a resiliently

deformable lip 41 of the weatherstrip when the door or window is closed.

[0016] The weatherstrip 40 comprises a flattened and elongate body 42, for example, extruded in semi-rigid plastics material (EPDM) and, in the embodiments of Figures 1 and 5, has two appendages 44, 45 projecting from its lower surface 43, and both having respective tooth-like elements 46, 47 which can be snap-engaged on the end lip 25 of the element 11 and on the tooth 39 of the clip 30, respectively. In contrast, in the embodiment of Figure 6, the weatherstrip 40 has a restrained-coupling member 245 with deformable longitudinal lips which can be housed in a groove 246 formed in the first wooden element.

[0017] The lip 41 is preferably coextruded with the body 42 in a softer material than the latter. The lip 41 may, however, possibly be formed with a geometrical shape other than that shown, and may be made of material the same as that of the body 42 (both in composition and in stiffness).

[0018] The weatherstrip or weather bar 40 is fitted on the straight or almost straight sides of the door or window. In order to form joints at the corners, the invention provides for the weatherstrip 40 to be cut at 45° and vulcanized or, alternatively, for the use of a corner element 50 shown in Figures 3 and 4.

[0019] The element 50 is formed by moulding of plastics material, for example, EPDM and, in section, has a body 51 with an appendage 52 which can be engaged in a restrained manner in the groove 16, and with a groove 53 in which the end lip 25 is snap-engaged. The body 51 bears a lip 54 which takes the place of the lip 41 at the corners, and a respective cover plate 56 is disposed over each free end of the body, projecting from the body 51 in order better to house the corresponding free end of the weatherstrip 40.

[0020] The section B has elements functionally similar to those of the section A except for the weatherstrip 40. A first, wooden structural element 60, a second, aluminium structural element 61 and clip joining means 62 between the above-mentioned structural elements can be recognized therein. The section also carries a double windowpane 64.

[0021] The section A is assembled by fitting the joining means 12 between the two structural elements 10, 11 in the manner shown. The entire operation is performed without the fitting of any screws, nails or similar auxiliary joining means. The weatherstrip 40 is then snap-fitted by engagement of the two appendages 44, 45 between the appendage 37 and the end lip 25 and between the appendage 38 and the wall 17, respectively. The above-mentioned appendages 44, 45, 37, 38 and the end lip 25 with the respective tooth-like elements, where these are provided, constitute engagement means and complementary engagement means by which the weatherstrip 40 is snap-engaged on the joining means and on the second aluminium structural element. The free end 49 of the body of the weatherstrip 40 bears on the wall

18.

[0022] When the straight portions of weatherstrip have been fitted, it suffices to fit the corner elements 50 at the corners of the door or window frame in the manner described above. The weatherstrip is also fitted without any auxiliary fixing means such as nails or screws.

[0023] In order to disconnect the aluminium section from the wooden section, once the weatherstrip (if there is one) has been removed, the two elements 30a, 30b of the clips concerned can be disconnected by being slid relative to one another in the region of the dovetail joint, the webs and lips 22a, 22b and 23a, 23b then being slipped off the disassembled head 31. With the clips 130 and 230, on the other hand, the disassembly of the wooden and aluminium elements requires the application of sufficient force to break the complementary lips of the clips.

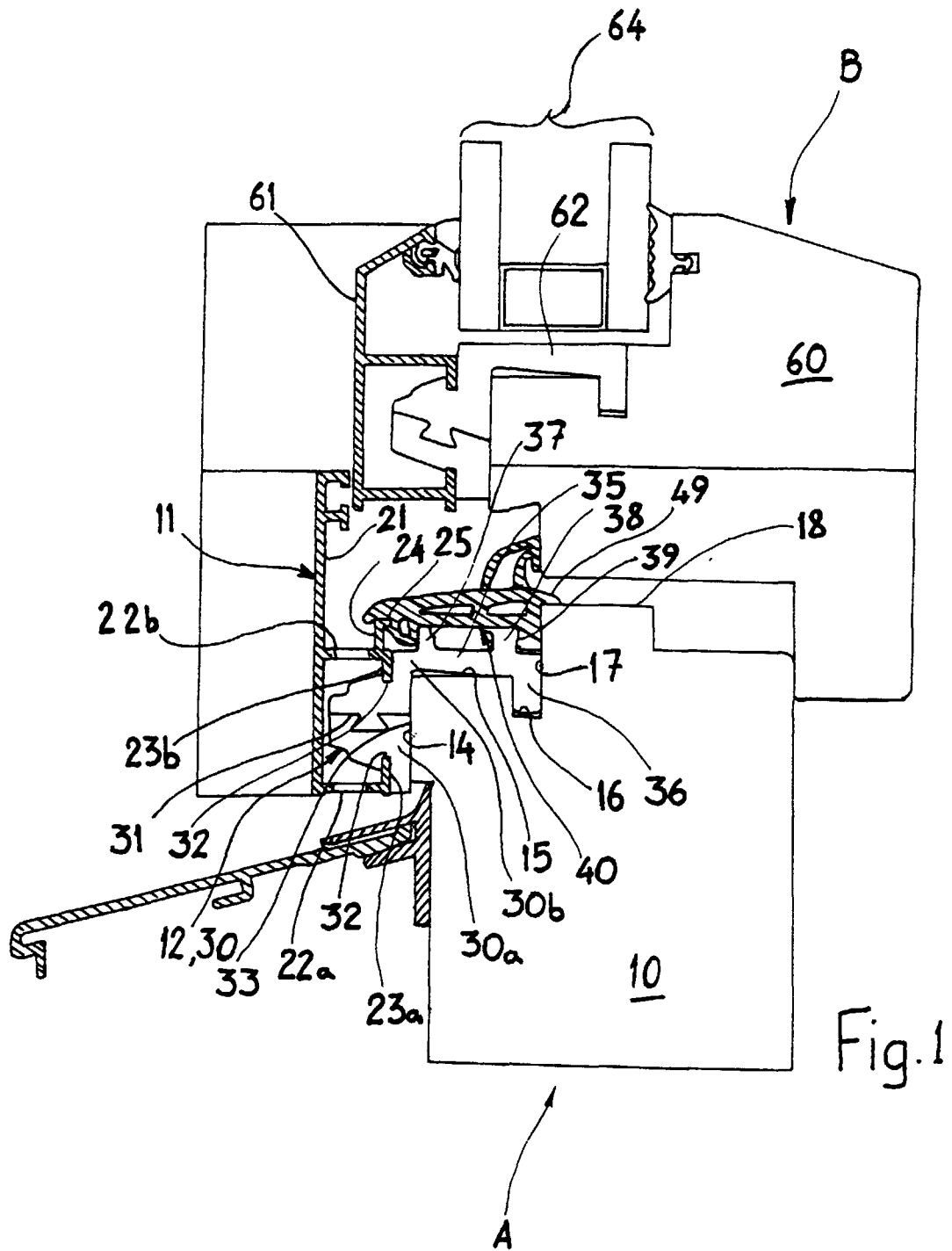
[0024] The invention thus solves the problem defined and achieves many advantages. Amongst these is considerable speed and ease of assembly even by unskilled people. The absence of screws improves the quality of the door or window frame, facilitating maintenance. Moreover, the fitting of the weatherstrip and its removal, if necessary, as well as the formation of corner connectors for the weatherstrip are considerably simplified. Not least, the weatherstrip, the clips, and the aluminium section can easily be replaced even after installation.

Claims

1. A composite wood/aluminium structure for the manufacture of door and window frames, comprising:
 - a first, wooden structural element (10, 60),
 - a second, aluminium structural element (11, 61), and
 - joining means (12, 62) between the structural elements, characterized in that the joining means comprise a plurality of clips (30) disposed at intervals along the structural elements, connected to the first structural element (10, 60) by a restrained coupling and to the second structural element (11, 61) by a shaped coupling, both couplings being releasable and being the sole means of connection between the elements and the clips (30, 130, 230) so that the connection between the structural elements (10, 11) is releasable.
2. A composite structure according to Claim 1, in which the shaped coupling is a snap-coupling.
3. A composite structure according to Claim 1 or Claim 2, in which there is a weatherstrip (40) with a lip, fixable to the joining means (12) and/or to the structural elements (10, 11) to define a sealing abutment region for a complementary section, the

joining means (12) and the weatherstrip (40) having respective engagement means and complementary engagement means (37, 38, 44, 45) by which the weatherstrip (40) is snap-engaged, by means of the joining means, at least on the joining means (12) 5 and on the second, aluminium structural element (11).

4. A composite structure according to Claim 1 or Claim 2, in which there is a weatherstrip with a lip (40), fixable to the structural elements to define a sealing abutment region for a complementary section, the structural elements (10, 11) and the weatherstrip (40) having respective engagement means and complementary engagement means (138, 139; 245, 246) by which the weatherstrip (40) is snap-engaged on the second (11), aluminium structural element and is engaged in a restrained manner on the first wooden structural element (10). 10 15 20
5. A structure according to Claim 3, in which the engagement means and the complementary engagement means comprise two parallel and spaced-apart appendages (44, 45) projecting from a body of the weatherstrip and snap-engaged with the clip (30) and with the second structural element (11) respectively. 25
6. A structure according to Claim 4, in which the engagement means and the complementary engagement means have tooth-like elements (46, 47). 30
7. A structure according to one or more of the preceding claims, in which the weatherstrip (40) comprises a body (42) and a lip (41), the lip (41) being formed by coextrusion with the body. 35
8. A structure according to Claim 7, in which the lip (41) is made of a softer material than the body. 40
9. A structure according to one or more of the preceding claims, comprising at least one corner element (50) for angled connection between two adjacent portions of weatherstrip. 45
10. A structure according to Claim 9, in which the corner element (50) comprises a cover plate (56) at each of its free ends, the cover plate extending over the adjacent weatherstrip portion. 50
11. A structure according to Claim 9, in which the corner element has an appendage (52) for restrained coupling in a groove (16) of the wooden element (10), for the independent fixing of the corner element (50) to the wooden element (10). 55



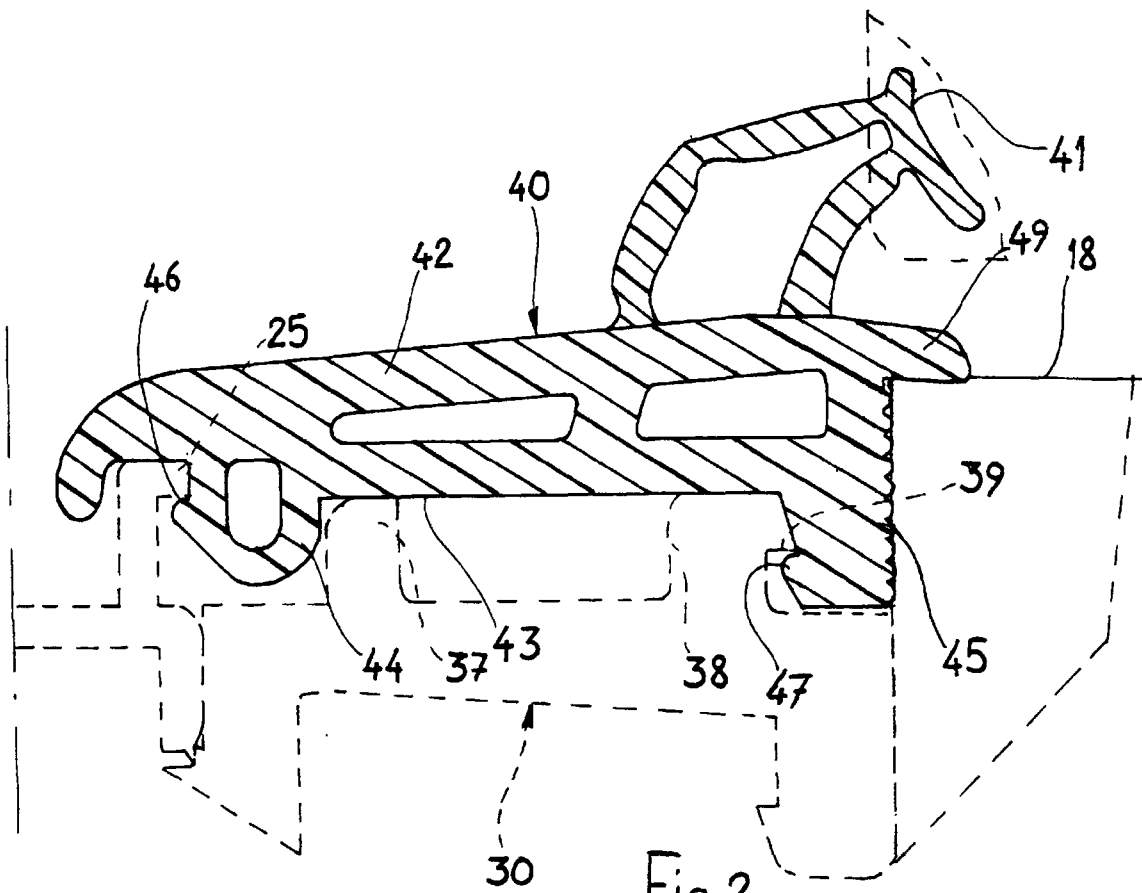


Fig.2

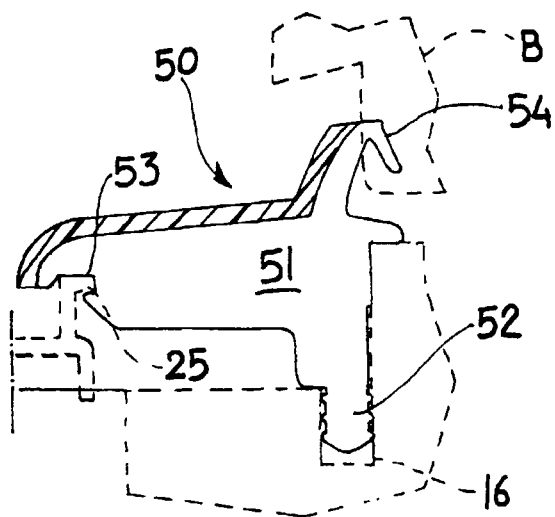


Fig.4

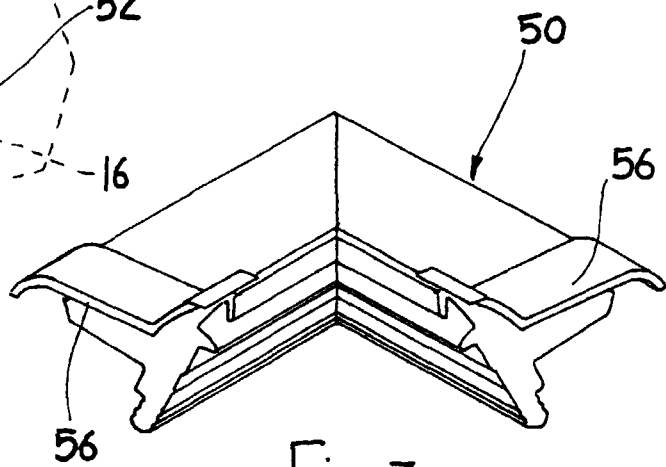
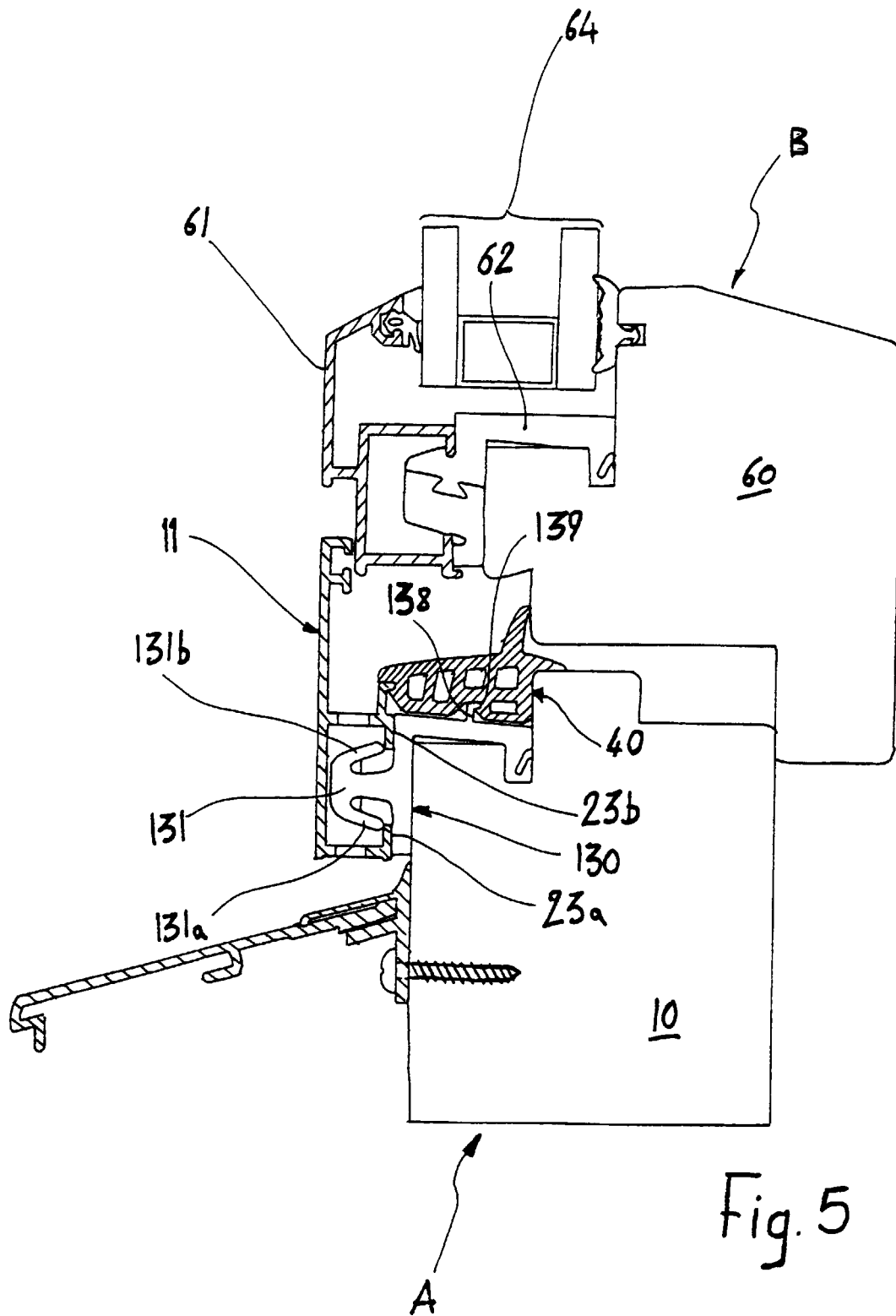


Fig.3



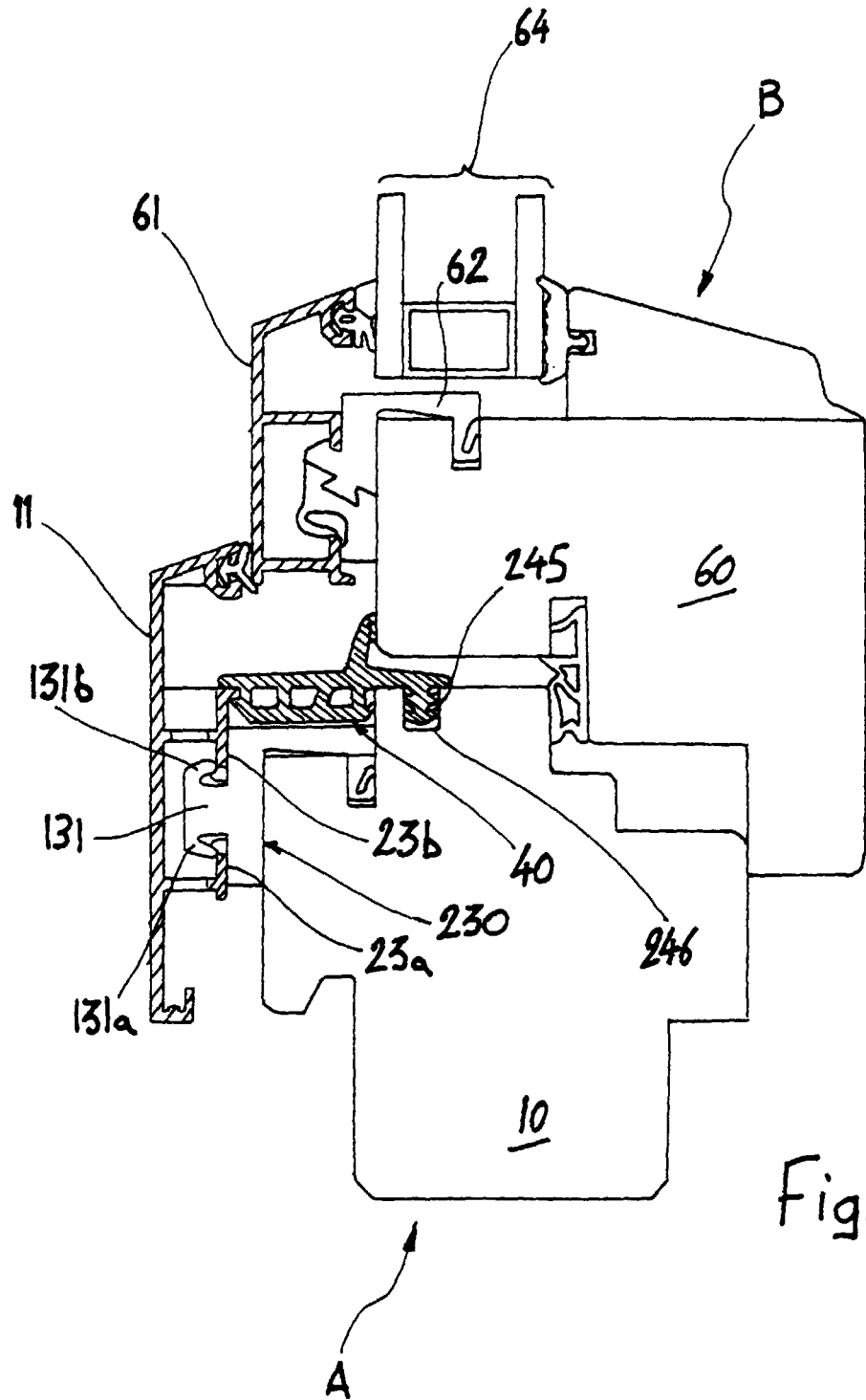


Fig. 6